

## Life on an Edge among the Changpas of Changthang, Ladakh

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**ABSTRACT** The Buddhist Changpas-pastoral nomads of Changthang, Ladakh form an ethnic entity. Like other nomads in the world, the pastoral nomads of Changthang are a minority, suffering problems of under representation, social, economic and geographic marginalisation. The region is extremely poor in conventional energy sources (fossils, fuel and wood) and has almost no industrially exploitable resources. Natural environmental limitations dictate many aspects of traditional life, especially settlement pattern and economic system. Among the Changpas, the pastoral mode of livelihood is an evident attempt to adapt to a natural environment, which provides no plants as food that can support humans and has no potential for growing food crops. Under such conditions, the only solution is to domesticate large herds of various animals, which can feed off the plants and in return, the animals can sustain humans. Since, the ecological conditions of Changthang are not favourable for crop growing, the Changpas raise large herds of sheep and goats as well as transport animals like yaks and horses. These animals provide the Changpas with meat, milk, varieties of wool, which they use themselves and barter for grains and other utilities. This economic interdependence of nomadic pastoral and settled population has been an important characteristic of the society in this area. The Changpas social behaviour is, in part, a response to constraints and opportunities of the natural environment. Both stability and change are outcomes of response to the immediate needs of daily life. The basic form of social organisation in the area was rural, and social relations among the agriculturalists, nomadic and semi-nomadic groups were based on trade and exchange of essential commodities. The Changpas' subsistence level pastoral economy, traditional social and religio-cultural systems are composite part of cold desert's ecological system. Their way of life shows a capacity to adapt themselves to the rugged cold desert environment. The Changpas possess a high degree of specialised knowledge and a flexible social organisation to make viable the mobile mode of production. Despite the ecological constraints, the Changpas were managing their environment for making a living without outside intervention. Their own societal controls like polyandry and cutting of excess animals, helped in turn by their customary rights and equity in resource allocation has helped them. The Changpas are organised using a patrilineal idiom, all members being patrilineal descendants of the founding ancestor. Rangeland, livestock, manpower and the considerable knowledge of the skills necessary to exploit them effectively are the principle economic resources of the Changpas of Changthang. Resource management in a risky environment illustrates the skills of the Changpas for survival. Traditional practices of Changpas, such as the rotation of grazing areas and use of reserve pastures in case of natural calamities help manage the variability of ecosystem and bail out pastures from a state of permanent degradation. Each animal has its own specific characteristics and adaptation to the environment. Rearing together different animals maximised the use of vegetation in the pasture. Different animals graze on different plants. In recent decades, the Changpas of Changthang have been experiencing changes due to external pressures that have altered political, economic and social landscapes. Traditionally, the Changpas were self-sufficient and livestock were providing them with their food and lodging. In recent decades, continuous massive defense investments and improvement in communications; proliferation of government departments; introduction of development plans; provision for basic amenities, alterations in traditional subsistence economy, its commercialisation and extension of know-how through government departments and non-government organisations and tourism has led to a higher motivation among local people for better standards of living. Increasing administrative and market integration and population growth over the years have weakened socio-homeostasis with no functional substitutes for restoring positive social system. For centuries, pastoralists in Changthang have lived in the context of environmental uncertainty and have developed a diverse range of strategies, institutions and network to minimise this unpredict-ability and risk. Pastoral management strategies, which may have worked previously, may or may not be sufficient now. The three communities of Samad, Korzok and Kharnak responded differently to these changes. Various pressures with an ever-increasing rate of change necessitated the adoption of new strategies for survival.

### INTRODUCTION

The present study deals with the pastoral adaptations of the Changpas of Changthang, Ladakh in India (Fig. 1), which underwent dramatic changes in the last few decades. Ladakh is

a cold desert. The local Changpas practice yak, sheep and goat rearing as a part of their subsistence. Maintenance of such herds was possible only through a skillful organisation of the migration movements to avail pastures in certain niche or at certain times in the particular environment of the cold desert. Changthang region saw a number of changes with major conse-

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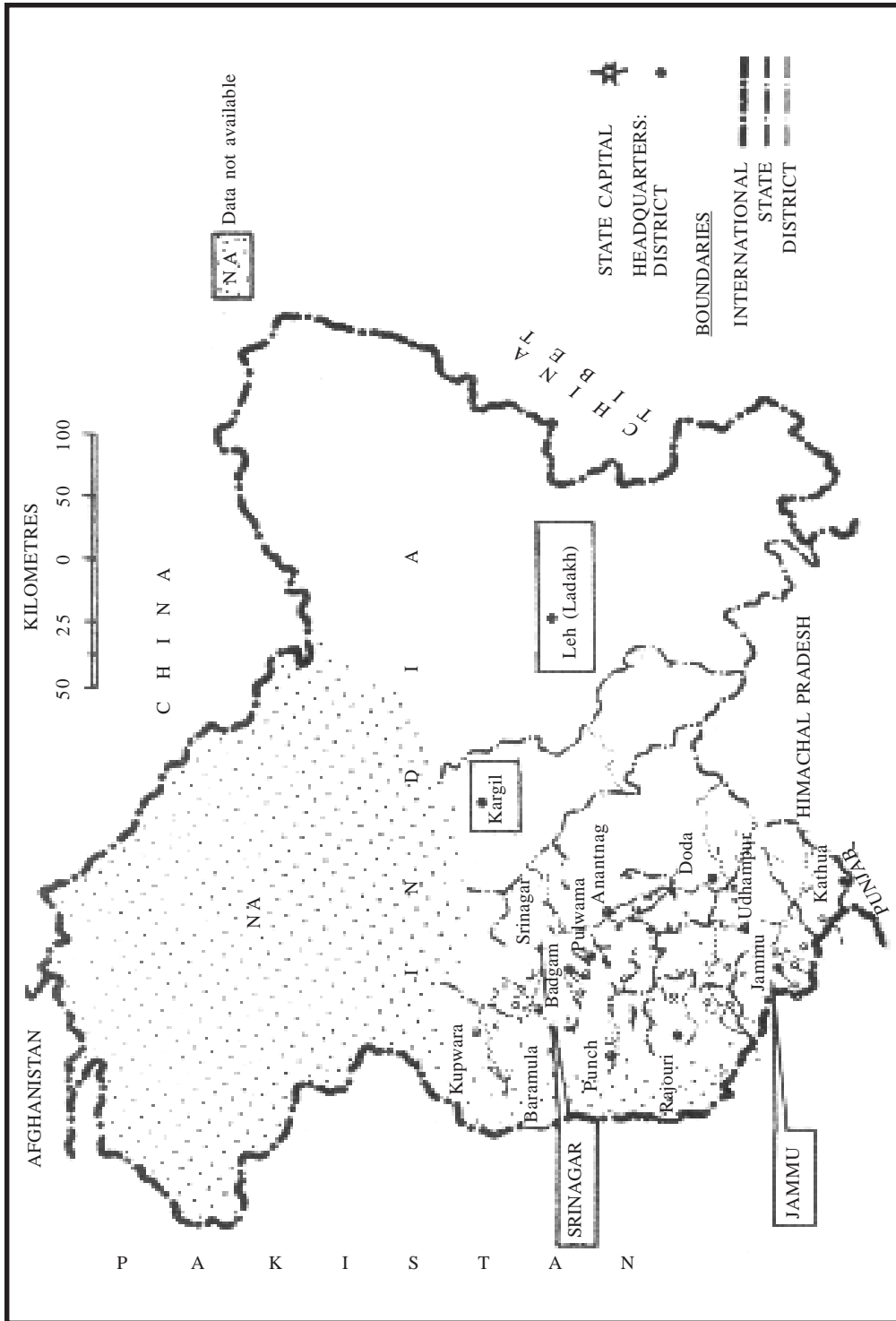


Fig. 1. Jammu and Kashmir administrative divisions 1981

quences for the Changpas, the pastoral nomads of the area. This paper is based on information gathered from the field areas of Changthang, Ladakh, in 1990, inhabited by Changpas<sup>1</sup>. After 12 years, I had the opportunity to revisit the area with the World Wide Fund for Nature-India (WWF). In 1990, Changthang area was in the 'Restricted Areas Zone' and was accessible to citizens of India that too with prior permission from Deputy Commissioner's Office in Leh. This area has evolved and witnessed change. The focus of this study is the response of traditional pastoral nomads to the changes and implications of this response for the region.

### Conceptual Framework

The present study discusses the system of livestock production and management typical of Changthang region (Ladakh), including the ecological, economic, cultural and political factors. It aims to understand the adaptation of traditional subsistence techniques to its particular environment, together with the far-reaching socio-economic alterations imposed on this traditional system by external factors. Adaptation is a key concept in anthropology and anthropological studies focusing on pastoral subsistence and its relations to environment can be traced back to 1940s (Evans-Pritchard 1940; Gulliver 1955; Stenning 1959). The concept of adaptation of human system to global change is very broad. Adaptation is a necessary strategy at all scales to compliment changes. Adaptation has the potential to reduce adverse effects. Adaptation can be defined as adjustments of a system to reduce vulnerability and to increase the resilience of a system to change, in this case, the socio-economic system. Adaptation is a dynamic process that delves in to the deepest recesses of creativity. Overcoming adversity is what stimulates growth and development.

Adaptive capacity is an important concept for understanding adaptation and is a set of mechanisms that a society possesses to survive change. The adaptive capacity is motivated by factors operating at many levels-both physical and social. "Adaptations can occur at multiple scales and what may be adaptive today in response to perceived change may not be tomorrow" (Nelson et al. 2007, cf. Galvin 2009). Physical constraints are important but in most cases, it is the social processes which increase

or decrease adaptive capacity. Steward (1955) claimed that environment and culture are not separate spheres but are involved in dialectic interplay or what is called feedback or reciprocal causality (Kaplan and Manners 1972: 79). The concept of reciprocal causality involves two ideas: that neither environment nor culture is a "given" but each is defined in terms of others, and the environment plays an active part, not just a limiting or selective role in human affairs. The relative influence of environment and culture in feedback relationships is not equal (Kaplan and Manners 1972). According to this view, sometimes culture plays a more active role and sometimes environment has an upper hand.

In the mountains, the notion of cultural adaptations supplied one of the main conceptual approaches. Rhoades and Thompson (1975) described two such strategies-*generalised* and *specialised*. In generalised strategies, population exploits all the local zones. In specialised strategy, population exploits only one zone. Werge (1979) described three strategies in Central Andes- the *compact*, similar to generalised, the *archipelago* (suggested by Murra 1972 for precontact cases) in which migration helps in exploiting widely dispersed zones and *dispersed*. The dispersed strategy was based on barter system by exchanging products of one ecological zone with another ecological zone, thus creating a symbiotic chain. Forman (1978) added a fourth '*mixed*' strategy. Mixed strategy suggests a direct human access to two or more zones with indirect access to other zones through communities based in them or through commerce. Thomas (1979) has stressed on multiple resource bases, emphasising local conditions and a high degree of behavioural flexibility at the individual, household and community levels and relates these patterns to five specific response types: *rotation, regulation, cooperation, mobility and storage*.

The social impulsive forces of adaptive capacity are varied but may include broad structures such as economic and political processes, as well as processes, which operate at the local scale such as access to decision-making, and the structure of social network and relationships within the community. Steward (1955) believed that some sectors of the culture are more prone to a strong, environmental relationship than others and this he refers to as a "culture core". Culture core consists of economic sector of soci-

ety; those features that are “mostly related to subsistence activities and economic arrangements” (Steward 1955: 37). Pastoral management or governance over natural resource use surrounds the center of pastoral adaptive capacity, which includes both formal and informal institutions. Pastoral systems are under numerous constraints and pastoralists are adapting and trying to remain flexible. The natural state of pastoral system is one of change and it is not easy to assess the state of adaptation. As change is often unpredictable, the system should be flexible enough to respond to changes for maintaining the smooth run of the society (Nelson et al. 2007). A numbers of changes are taking place in the pastoral systems worldwide. We cannot say whether the responses are increasing the adaptive capacity of pastoral system to change or, conversely, increasing vulnerability. For a long time, pastoralists have lived in the context of environmental uncertainty and have developed a diverse range of strategies, institutions and network to minimise this unpredictability and risk. However, the systems that are adaptive under one set of socio-economic circumstances may be less successful when conditions change. Among pastoral nomads, there are two types of adaptations that lead to a change: situations where conditions force nomads to look for other alternatives, sedentarise or emigrate. The pastoral nomads are increasingly responding to change by opting out of the nomadic way of life through sedentarisation. In other cases, the nomads continue with the dispersed resource-used strategies and try to find out alternatives in the place of origin itself. In order to provide sound policy advice, it is important to gain knowledge of these formal and informal strategies in the light of increasing climatic variability, growing competition for pasture, population rise and development. The environmental conditions in the area under investigation, the Changthang, Ladakh, constitute a significant factor in the socio-cultural system of the area. The above stated cause-effect is not linear, but more of a circular system with a good deal of feedback. At this point, it may be stated that social relations, technology and environment may be treated as variables, which are part of a system. The three variables are interrelated and interdependent and the functioning of system may change in any one of the variables e.g. an economic change could have an effect on environment as well as

on social relations. In addition to environment, there are external forces imposed either by political events during the course of history or by diffusion including contact with people of a different origin and innovations made by community during the course of time which induce change in the community.

### **Pastoral Nomads**

Pastoral economy of nomads depends on the utilisation of pastures markedly seasonal in their occurrence. Nomads raise mixed herds of sheep and goats for animals and animal products, and domesticate yaks, horses etc. for their products as well as for transportation of goods and human beings. The whole group migrates in units between lowland and highland pastures. All nomads distinguish themselves from their neighbours and business partners as a social group of livestock proprietors and traders. Nomads utilise pastures to which they claim right of access based on customary law. However, they pay grazing taxes to state or individuals. They barter animals and animal products for grain and other necessities of life. They do not invest heavily in landed property. In the absence of permanent settlements, the residential pattern is characterised by the encampment of tents near the grazing area. Traditionally, mountain nomads were engaged in a few side activities and transactions beyond animal husbandry such as transportation and other commercial activities. Some of these traditions have changed drastically in recent years.

### **STUDY AREA: CHANGTHANG**

The Changthang region in the Indian Trans-Himalayan area of Ladakh represents the western extension of the Tibetan Plateau, an important highland grazing system. It is a cold desert, one of India's five listed 'bio-diversity' regions, with a short summer and Arctic like winter, of sparse vegetation with a unique biotope, whose wetlands are recognised for indigenous and migrating birds and surrounding grasslands and marshes.

Changthang sub-division with an area of 21,000 square kilometers, occupies a strategic position, sharing border with both China and Pakistan (Fig. 2). The cold desert-like landscape and vast plains of Changthang share the area and climate with the adjoining region of Tibet. It has an extremely short

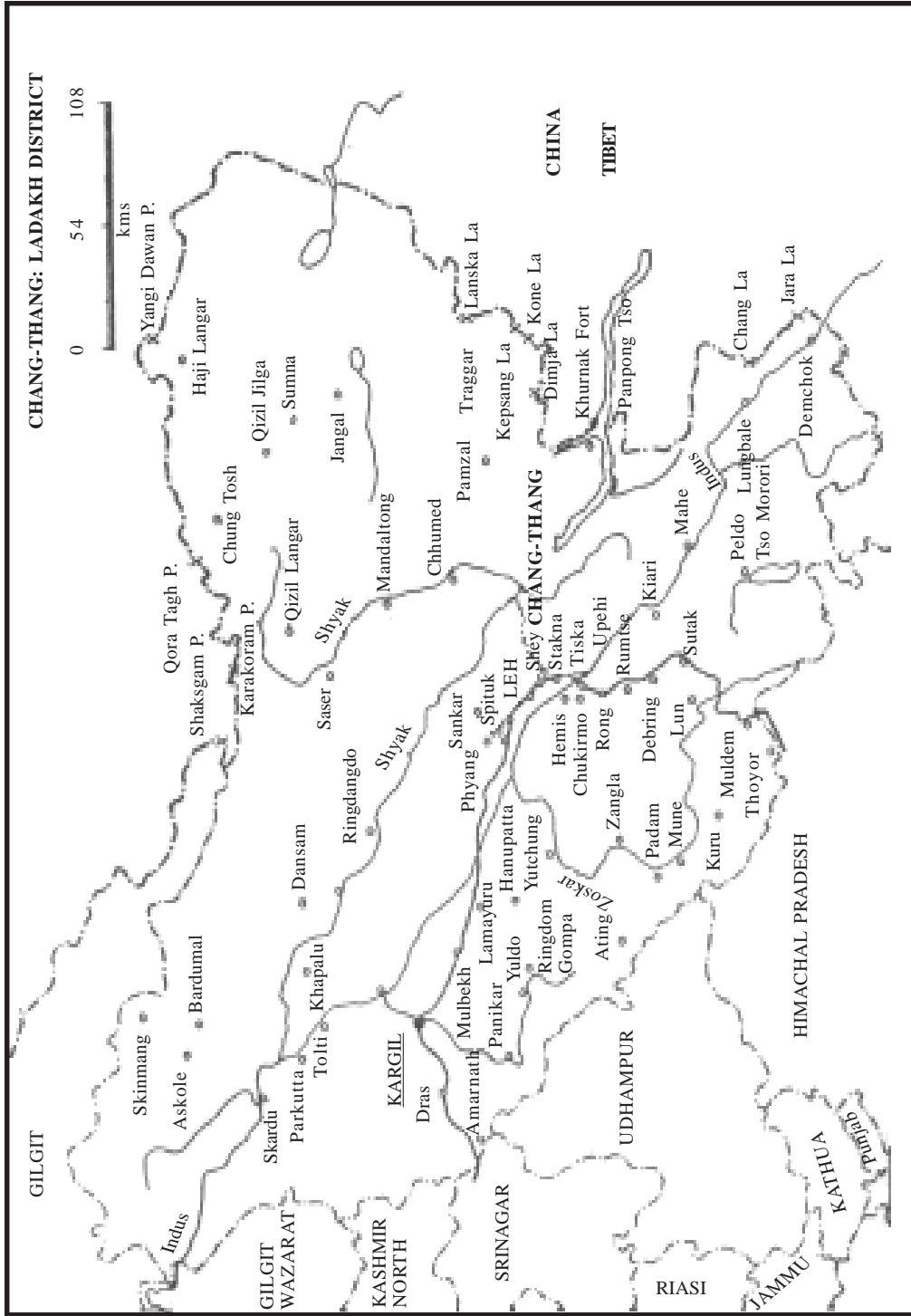


Fig. 2. Chang-Thing: Ladakh district

growing season, a short tourism period and remains covered under the blanket of ice and snow for six months in a year. Changthang, in Ladakh occupies the upper reaches of river Indus and its tributaries and besides the plateau, comprises mountains separating the main drainage courses. The ridge of the Karzok Tso, separates two valleys of Rupshu, the Tsomorari and the Pangolumba. Snowline in Rupshu is up to 6500 metres. The climate is severe and extreme dry. One gets sunburnt and frost bite on the same day. Its main habitats are rangelands (especially high altitude pastures) and wet lands (lakes and marshes). Changthang is a relatively low productive area with a low density of human population but there is stiff competition for the forage resources between wildlife and the herds of the nomads as livestock raising is the mainstay of sustenance and livelihood.

Changthang accommodates 41 villages and hamlets, inhabited by about 8,000 settled and nomadic pastoralist population (Kitchlu 1997). Tibetan Refugees, who crossed the border during early 1960 and remained within Indian Territory, joined the existing population. It consists of two administrative blocks – Durbook and Nyoma with 23 villages. Out of which 18 are in Nyoma block and five in Durbook. The area is restricted and outsiders need a permit to go beyond Nyoma. Due to the strategic position of the sub-division, there is massive military presence. A well-maintained motorable road (highway) which passes through Nyoma traverses the area, facilitating the troop's movement, which is stationed in Nyoma.

### **Nyoma Block**

This is one of the coldest blocks of the district at an altitude of approximate 13,000 to 14,000 feet from the sea level. Owing to a harsh terrain, difficult approach, severe winter and lack of infrastructural facilities, the block is backward and people live below poverty line. The block splits up diagonally by the river Indus. Strategically the block is very important as it is bounded in north and east by China. Indian Air Force and Army have jointly developed an Advanced Landing Ground (ALG) for extreme weather conditions at Nyoma, 23km from Line of Actual Control from China. This would ensure that movement in the area continues when road traffic gets affected during the harsh winters. It will also

enable improved communication network in the region, facilitating economical ferrying of supplies as well as promotion of tourism. Nyoma block includes three nomadic communities: the Changpas of Samad, Korzok and Kharnak respectively referred as Samadpa, Korzokpa and Kharnakpa, who use a large rangeland - Rupshu- Kharnak for grazing their animals.

In discussing the adaptations of Changpas pastoral life, it is essential to know something about the topography, water sources, grazing sources and other elements of physical environment that make pastoralism viable in Changthang.

### **Topographical Features**

Changthang (Chang-north, thang-plain) literally means the “north plain” but in common parlance an elevated plain or wide open valley, too high and too cold for any but pastoral use. Topographical features include gorges and vast plateaus (sometimes 50-60 kilometres long and 20-30 kilometres wide grounds) which range from undulating to sloping lands. The absence of consistent slope did not allow water to drain away. Rather the undulating land formed itself into a huge basin, into which snowmelt streams flew, and finding no outlet settled into the great lakes. The Changthang region forms the Western extension of the Tibetan plateau and lies mostly above 4,500 m. The area lies approximately between 33° 10' to 33° 30' N and 77° 55' to 78° 20' E. The Changthang area is characterised by little rainfall and snowfall (only three inches of precipitation on an average per year). It is a cold desert with large dry steppes in open valleys. The temperature in Changthang during summer (from April to September) varies from 6.1 to 13.2 with the highest average of 17°C in July-August, During winter months, temperature decreases far below the freezing point (Khan and Wani 1986).

The soils of the area are shallow with poor physical condones like sandy to sandy-loam texture, higher rate of infiltration and percolation. The surface of the hills is chiefly disintegrated rocks, and the surface of the valley is earth or gravel. The combined effects of environmental factors limit the natural vegetation of Rupshu-Kharnak and make agriculture a difficult proposition. The vast, undulating, high altitude plains are, however, well suitable for mobile pastoralism and are being managed by Changpas as such.



### Flora and Fauna

Rangelands of Changthang, which are a repository of forage, support a large number of livestock and wild ungulates in resource-limited environments. In the higher pastures, more than two hundred species of wild plants grow. The most palatable of these are species of *Astragalus*, *Artemisia*, *Agropyron*, *Festuca*, *Orzopris*, *Lolium* and *Stipa*. *Gyabshen* (*Chenopodia*, *Eurotia ceratoides*) is a common shrub in the area. Its density, cover and biomass were highest in the lower slopes and sandy plains; while it was completely absent in the marsh meadows. It has an important place in this cold and arid ecosystem. The plant has a woody rootstock and aerial shoots. The Changpas depend on the thick rootstock of this plant for their firewood requirement *Tedunga* is another bush that grows in the area. This bush helps in keeping the soil together. With the increasing pressure of tourism and trekkers and grazing animals, people are cutting it down randomly in large quantities to hoard it. Changthang is short of fuel wood and people use bushes and roots of different grasses as fuel. The Changpa women regularly collect sheep and goat pellets for fuel because it burns for a longer time and emits more heat.

In addition to domesticated animal population of sheep, goats, yaks and horses, the area abounds in other animals as well. Significant mammals include the Blue sheep or *bharal* (*Pseudois nayaur nayaur*), Siberian or Himalayan Ibex (*Cra ibex*), Ladakh Urial or *shapu* (*Ovis vignei*), Tibetan Argali (*Pantholops hodgsoni*), Tibetan gazelle (*Procapra pictieandata*), Kiang (*Equus kiang*) and Tibetan wolf (*Canis lupus chanku*). Snow leopard (*Uncia uncial*), a flagship species is most significant.

### Wetlands

South Changthang has several wetlands, lakes and streams, including three big ones- Tso-Moriri and Pangong-Tso and Tso-Kar, extended marshes and seasonal rivers carrying melting water during early summer. Lakes, ponds and marshes form a significant water-reservoir network. The three wetlands, especially Tso-Moriri and Tso-Kar, host many species of flora and fauna. Ponds, lakes and seasonal streams contain fresh water while bigger lakes (like Tso-Moriri and Pangong) contain brackish or even highly concentrated salt water (Tso-Kar). The basins

of these lakes harbour populations of endangered Tibetan argali sheep (*Ovis ammon hodgsoni*), blue sheep (*Pseudois nayaur*) and Tibetan wild ass (*Equus kiang*), as well as wetlands used for breeding by migratory birds. These areas have been traditionally used as grazing grounds by the local Changpas, and are now subject to increasing tourism.

### Rangelands

Changthang Plateau consists mainly of rangelands. The Scrub steppe (*Caragana-Eurotia*, *Artemisia*, and *Tanacetum*), Desert steppe (*Stipa-Allysum-Oxytropis* and *Leymus secalinus*), wet and marsh meadows dominated by sedges and cushion-like vegetation or fell fields at high altitude are four distinct physiognomic units of vegetation. All water bodies or wetlands of Changthang have extended marshes. These marshy meadows form a part of the pastures and support maximum number of livestock during crucial winter months. This specific eco-system (ponds, small lakes, rivers, brooks and wet mound covered marshes) offer large diversity of flora within the harsh high altitude environment.

## ECOLOGICAL ADAPTATIONS IN CHANGTHANG

The Changpas integrate Changthang's vertical and horizontal life zones for making a living. In addition to the nomad Changpas, other groups that regard themselves as directly derived from the Changpas or claim a common or collateral ancestry also reside here. In most of the villages of the regions through which the Changpas migrate, is a considerable sedentary population of the Changpas. In some of the villages, the whole population looks upon itself as a settled section of the tribe, while in other places the settlers are dispersed as individuals or in small family groups.

The ecological adaptations among the Changpas of Changthang are as follows: (1) Transhumance based on sheep, goats, yaks and horse herding without agriculture as practiced by the Changpas of the high plateaus of Rupshu, Kharnak and Karzok region. In Rupshu and Khamak, the entire population lead a nomadic life whereas in Karzok about ninety per cent population move from one ecological zone to another; (2) Transhumance based on goats and sheep rearing with marginal agriculture as practiced by the Changpas of Kerey and

Chumoor. In summer, they cultivate their lands and grow barley. As they have more goats and sheep, they graze their animals at higher mountain valleys; and (3) Sedentary farming with limited livestock raising as practiced by the people of Kuyul, Damchok, Kery, Chumathang, Nyoma, Ney, Kesar, Linkchey etc. settled along the river. They generally raise one crop annually and produce wheat and barley. Besides this, they cultivate vegetables like turnip, potatoes and peas. Some villagers also grow mustard.

Though it is claimed that at one time all the people living on the Changthang were nomadic pastoralists, today however, in Indian Changthang both nomadic pastoralists and those practicing agriculture exist with the latter domesticating livestock and practicing agriculture as well. Traditionally, there were only two nomadic pastoralist groups living in Changthang namely- Kharnak, and Rupshu. Rupshu is the area near Lake Tso-Moriri and is made up of two parts, Samad which means the lower part, and Korzok, which means upper part of the larger area (ICIMOD 1998). Changthang sub-division can tentatively be divided into two major cultural areas-the *Drok* and *Rong*. The *Drok* culture area corresponds to transhumant Changpas and *Rong* culture to semi-transhumants *Lon-pas* and sedentary *Rongpas*. The Changpas are traditionally and still predominantly *pashmina* goat breeders. They lead nomadic life on the upland valleys. They graze their animals on pastures at upper slopes known as *Brog* (Pronounced as *Drok*). They spend their whole life in large, portable yak-hair tents (*rebos*). They have permanent winter villages where old and retired Changpas stay in stone houses. They use different valleys for winter and summer grazing and use different parts of the valley for a particular period. The nomads of Rupshu used grazing land, which stretched from the Taklangla pass in eastern Ladakh in the west into Tibet in the east and the area included Nyoma and Hanle near the Tibetan border (Jina 1995). Strict communal laws regulate their grazing movements. The economic strategies of Changpas in this region seem to be the utilisation of different biotopes at varying altitudes

### Rong Cultural Area

Rong cultural area lies in the high altitude mountain valleys and along the narrow valleys of High Mountain in the north. The cultivated areas and settled population of *Rong-pas* inhabit the villag-

es of Kuyul, Damchok, Chumathang, Nyoma, Ney, Kesar and Linkchey situated along the Indus River. Agriculture is the way of life of people. The people here are almost completely dependent on artificial irrigation. Channels draw water from natural rivers and streams in the area under the super-vision of "*Churpan*".

### Lunpa Cultural Area

Lun-pas, the residents of Kerey and Chumoor villages in the northern region of Great Himalayan range are semi-transhumants. Here, they have few cultivated fields where they grow barley in summer. As they have large number of sheep and goats, they migrate to higher mountain valleys or pastures zone with their flocks. Both Kerey and Chumoor villages are high plateaus at 5500 and 6500 metres above sea level. As these villages are located along the higher narrow valleys, they are popularly known as *Lunpas*. Even under adverse weather conditions, these people are able to grow barley, peas and turnips with simple technology. Besides agricultural work, many families are engaged in pastoral and trading activities. They rear sheep, *changra* goats for wool and *Pashmina*. A family in Kerey has an average of five yaks, 4 *demos*, 10 sheep and 15 goats, whereas in Chumoor, the average family has 15 yaks, 10 *demos*, 20 sheep and 25 goats. Eighty per cent of Chumoor families live in *rebos* while on pastoral duties. The rest of the households arrange with families who migrate with their tents to take their animals for grazing on cash and kind payment. In the Kerey village, only 32 per cent families have tents and are engaged in transhumant activities, while rest 60 per cent families are engaged in agriculture and trade.

### Changpa Nomads (*Drok-pa*)

The people who inhabit the high plateaus of Rupshu-Kharnak of Changthang are the Changpa nomads. They domesticate large number of sheep, *pashmina* goats, yaks and horses. However, while the "Changpa" is the generic term, they are not a single homogeneous community. Groups are divided by their place of origin, each having its own chief and its specified grazing areas. Ladakh is home to 14 such groups, varying in size from 20 to 176 families, the average being about 130. While local variations exist, essentially all the groups share the same way of



life and the account given here applies in general to the Changpas living throughout Ladakh.

The three nomadic Changpa groups that inhabit the high plateaus of Rupshu-Kharnak are composed of three independent groups located at Kharnak, Samad and Korzok form the subject of this study. These pastoral nomads are said to have moved into Ladakh from the adjoining Tibetan Changthang or from the region known as Zhang-Zhung lying on the western edge of Tibetan Plateau.

Traditionally, the rangeland of Changthang was and is state-owned and individuals had/have usufruct rights. An average family owns over one to two hundred goats and sheep, several yaks and a few horses. Traditionally, Rupshu was spread into a large area. For the purpose of administration and distribution of grazing lands for livestock, the Rupshu *goba* divided the region into two areas: Sadod, the upper area and Samad, the lower area. The Rupshu *goba* managed both Korzok and Samad. Since Sadod was recognised with Korzok, it came to be known as Korzok, and Samad was referred as Rupshu. By 1940, the power of Rupshu *goba* weakened and Rupshu area broke away from his rule and had a new *goba*. Samad and Korzok, which were part of the Rupshu, split in the 1950 into two independent units. Despite the fact that Samad has its own gumpa, the Korzok gumpa acts as a major cohesive force and the nomads meet annually at the Korzok gumpa for religious ceremonies.

The Changpas being nomads do not live in permanent houses or practice agriculture, but they do have permanent structures in the area either for storage or for shelter. Korzok, Thugje and Dat are the permanent winter settlements of the Changpas of Korzok, Samad and Kharnak respectively. In Samad and Kharnak the whole community leads transhumant life, while in Karzok, 90 percent are transhumant and ten per cent lead a sedentary way of life. Including the permanent settlements at Korzok, Sumdo and Angkung, the total population in Rupshu-Kharnak constitute a little over two per cent of Leh District population. The three groups share the same way of life raising *pashmina* goats, sheep and yaks on natural pasturelands. They make full use of animals, using wool, hair and tendons to make clothes, tents blankets, carpets, ropes and pack bags, the hide and stomach for containers, dung for fuel, and sustenance from meat and milk. In the past, the Changpas traded salt and wool, which they exchanged for barley.

## SETTLEMENTS IN CHANGTHANG

### Korzok

The village of Korzok is located on a small hill at the south-west corner of Kyangdum along the north-west side of Tso-Moriri in the Rukchen valley of Leh district. Korzok in local language means “middle of the body” and also “middle of Mountains”. According to the Changpas, Korzok derived its name from two words; *Kor*, which refers to the livestock owned by the gumpa, and *zok* where goods are stored. It lies approximately between the north lat-itude 32° 58' and the east longitude 78° 15' at the height of 4600 metres. The Korzok area falls within the Nyoma Block and includes the semi-nomadic villages of Sumdo and Angkung. The history of Changthang indicates that the powerful feudal lords called the Rupshu '*goba*' once ruled it. The *goba* had organised the nomadic groups and systematically planned the resource use. After these *gobas* lost their power in the 17th century, the smaller villages organised themselves and elected headmen who now come to be called *goba*. During Rupshu '*goba*' reign, ten mud houses and one gumpa were situated at Karzok. At present, there are 50 houses in the village, but the floating population of the nomads, pitching their tents in summer, adds to the increase in number.

The 300 hundred years old Korzok gumpa as seen now is said to have been re-built in the 19<sup>th</sup> century on the right bank of Tso Moriri. The gumpa belongs to the Drukpa sect and houses 35 lamas. This gumpa is a focal points of the region of Rupshu and the *goba* its chief authority. All the Changpas gather once a year to celebrate a festival. At the end of July or early August, the festival of the gumpa takes place accompanied by lavish feast. There is a nunnery in Yagang. After the construction of the gumpa the Changpas gave up their animistic religion and adopted Buddhism. The Korzok gumpa owns livestock to ensure a supply of butter for butter lamps. The sale of their wool and fabrics goes towards the maintenance of the building, and the expenses of the lamas who reside there. The Changpas pay taxes to the gumpa and the money collected is used during festivals. The home of the Rupshu *goba* is located next to Korzok gumpa. The village was an important stage on the old trade route with Spiti. Motorable road has reached this main village on the western bank of Tso-Moriri.

The Changpa community at Korzok is composed of two parts, the permanently settled (*yulpa*) located in the village of Korzok and the nomadic pastoral population, the Changpas. In Korzok, the Changpas are agro-pastoralists. They arrange for their livestock grazing with other family members who lead a nomadic way of life. Korzok is one of the two-three places in Rupshu, where there is cultivation. Some 12 acres of land is sown with naked barley (which does not always ripen) and only five acres in Rupshu. These fields are at a lower level on the periphery of the lake.

They divert water from streams of melting snow. They do not use water of the lake as it is too brackish. Besides the stream, there is a perennial spring flowing down the mountainside. The villagers have dug a *nallah* along the higher slope and diverted this spring water to the village. This water is for drinking and is kept out of reach of animals. The hill stream has two channels, one for the working of the watermill and another for irrigation. At the time of the fieldwork, from 1989-1994, in Korzok village there were 27 permanent settlers. There were a number of stone and brick storehouses and a number of large, traditional two-storey homes. Facilities in the village include a primary school. In 1994, Ladakh Nutrition Project (LNP) conducted a study. It was found that only 40% Changpa children were attending school as compared to 69% of the settled population (Ladakh Nutrition Project 1995:29). The government has arranged teachers to travel with them to see them through till the fifth grade. They can move to special state-run schools after that for higher education. The Changpas who have means to educate their children send them to boarding schools in Leh. A survey of residential schools in and around Leh was conducted in 2001. It was found that admission records from nine hostels and residential schools have 54 students from Rupshu-Kharnak with twice as many males as females (Goodall 2004). There is a Maternity and Child Care (MAC) Centre, which despite being fully equipped and having both a salaried medical officer and assistant remains locked and unattended. People have to go to Nyoma, 95 kms away to avail the facility of Public Health Centre (PHC). However, the area remains cut-off for four months during winter and people have to rely on the *amchi*. There is one ration shop, a guest house and teashop in the village. A permanent

camp of Indo-Tibetan Border Force (ITBF) has come up adjacent to the village. The Changpas have built rooms around the Korzok gumpa, where they store the surplus things that they do not require when they are on the move. The Changpas of Korzok spend five months of winter in the valleys around Teygajung and Chumur in the extreme cold. Snow comes down from heights to valleys. Therefore, the better pastures in winter are all higher up, and access requires much climbing by the livestock and herders. In early June, the community divides into two groups one moving around the Tso Moriri and the other heading south. They reunite one month later at Korzok Phu, where they spend the next two months. They enjoy their summer near Korzok, because of good pasture of Korzok Phu, snowmelt stream and easy access to basic services in Korzok. In mid-September, they start migrating to Tatsang Tso basin, north to Korzok village where they stay for the next two and a half months. With the beginning of winter, they began their month long journey, around the Tso Moriri towards their winter pastures at Teygajung and Chumur. Like Korzok, they have their encampments at Chumur where they have storehouses, livestock pens and fields for growing fodder. During their winter migration, though they are far off but are better placed than the Samad and Kharnak Changpas as they have a medical facility of MCA nearby at Chumoor and another at ITBF station. They also have a resident *amchi* who migrates to Teygajung with them each winter.

The Korzok village is still a trading outpost for the *pashmina* wool. Many nomads' goat herders pass through this village trading their precious wool before the wool gets exported to Kashmir to be manufactured into *pashmina* shawls. The village does experience its fair share of comings and goings of tourists, traders and the nomadic Changpas. Tso-Moriri is a major tourist attraction in this area. At the time of my visit in 2002, Korzok was in the middle of a major change. There was brisk construction work everywhere. It seems that the Changpa are going to change their way of life. Korzok, being the only established village besides the lake has become an important destination for all visitors to Rupshu. It has 70 dwellings and few small shops, a small restaurant and number of white tents pitched by the tour operators for the tourists offering accommodation and catering. The only restaurant also had rooms with an electric light, which was solar powered via an accumulator. The marshes of Tso-Moriri, famous for water birds at-

tract number of tourists. There is one PWD guest-house with two bedrooms. The local tour operators provide tented accommodation to the tourists. Changpas have started constructing small private lodges at Korzok for tourists. Commercial development of the area is only a matter of time. There is good road and electricity is in the offing. The renovation of the old gumpa is taking place with the contributions of Changpas. Under World Wide Fund (WWF) - India project Conservation Committee and Nature Club has been established for Korzok village with locals.

Falling within the jurisdiction of Korzok are the two small settlements of Angkung and Sumdo Gongma. The village of Sumdo Gongma is situated 25 kilometres from Mahe Bridge along the road to Korzok. It is composed of 8 households. There is one stream which is fed by the snow and glacier melt. It is the main source of irrigation to their fields located near the village. For the drinking water they have a natural spring near the village which flows throughout the village. They live in stone houses which have been provided with the solar panels by the local government. The Angkung village, situated in Puga valley consists of 14 households. Semi-nomadic people who cultivate barley in the fields adjacent to their respective villages inhabit both the villages. One or two households in rotation manage livestock grazing collectively.

### Samad (Rupshu)

Samad Rokchen is located between the pastures of the neighbouring nomadic communities of Kharnak and Korzok and to the east of Leh-Manali road. It falls in the Nyoma Block. The area is connected by dirt tracks to Leh-Manali road or via upper Indus valley at Mahe Bridge and over Polo Kongla Pass. The Changpas and the Tibetan Refugees (TR), who came here after 1960, inhabit Samad. According to Hagalia (2004), there were 60 families with 300 members of the Changpas and 22 families with approximately 150 members of Tibetan Refugees in 2002-2003. The community headquarters is located at Thugje along the northern extent of Tso-Kar. This settlement comprises of a gumpa, where two lamas stay throughout the year and a small cluster of stone houses and dwellings for elderly people who choose to remain sedentary. The Thugje gumpa is located above the village. This area is not only barren but is known for the fast blowing winds, sand storms and extreme temperature

in the early mornings and evenings. The Thugje gumpa comes under the authority of the Rimpoche of Korzok. The Changpas of Korzok and Samad have mutual dependency in religious matters. The Samad Changpas donate money to Korzok gumpa for its upkeep and send young boys to Korzok gumpa for religious training. The Korzok Changpas in return send their lamas to conduct the religious ceremonies of the Samad Changpas. A Canadian NGO is building a hospital and warehouse for food. The village is in complete rebuilding, probably with the money that comes from the sale of the *pashmina*.

All the Samad Changpas have at least one storage room in Thugje where they keep extra food and equipment, while the Tibetan Refugees have their storehouses at Nuruchen, adjacent to a smaller fresh water lake- Startsabuk Tso, south of Tso-Kar. Previously, there were fields at Nuruchen for growing barley. These fields are no longer in use. There are two other buildings at Thugje, one of Sheep Husbandry Department (SHD) of Government of Jammu and Kashmir, and the other of Medical Department. Thugje has a water pump facility funded by the water-shed development programme and implemented by the Sheep Husbandry Department in 2002, in addition to a natural spring in the wetland. Samad lacks education and medical facilities. There is no *amchi* (traditional doctor) or health visitor. In case of an emergency, the people of Samad have to go to Nyoma Primary Health Centre. In serious cases, the patients are transferred to Leh hospital. Likewise, a mobile primary school was started but it proved of little help to the migratory population.

Samad is commonly known as Rupshu. However, in this study it will be referred to as Samad. The Changpas of Samad are pastoralists. The Samad grazing area stretches from Taklangla pass in the east of Pang and Polokanga in the west. They spend their summer in Skyangchuthang, their summer grazing area, just west of Tso-Kar Basin, along the Leh-Manali Highway. The Changpas stay here with their livestock from June to November and graze their herds in groups, the grazing area decided by their *goba* by a throw of dice. They spend their winters in Tso-Kar Basin. The Tso-Kar Basin is the catchment area of Tso-Kar Lake. The Tso-Kar Basin is characterised by cold and long winters with heavy snowfall. Accessibility of grass and water is a limiting factor and the community

divides in to small groups of five to fifteen tents. During winters, they move in clock-wise direction around the Tso-Kar basin. Hagalia (2004) states that the Changpa of Samad move between four different areas in the Tso-Kar basin during the winter- (1) Pankanugu and Thugje; (2) Napokhar; (3) Stasafuk and Nyangjunrak; and (4) Togra, Nigur, Zirgulang Zomolong. The last one is their emergency area and is used during the worst period with heavy snowfall (for details see Hagalia 2004). The Tibetan Refugees use Rigultang area as a winter pasture. The number of livestock in the Tso-Kar basin has apparently doubled since the 1960's, especially after the influx of Tibetan immigrants in the area. Apart from the Tibetan Refugees, the Samad Changpas share their traditional grazing area at Zara with the Changpas of Kharnak, as part of an intervillage dispute settlement negotiated in the late 1980s. The movement pattern of Samad Changpa consists of pre-decided areas of encampments. However, the availability of the resources decides the duration at one camp. Like the other Changpas, Samad Changpas have to graze the Thugje gomba animals in rotation. The families, who are in charge of gomba animals, get the best grazing areas. They move to that area with the gomba animals along with their own herd. The other Changpas move to another site with their herds. The third group of TRs moves to a separate area. The Changpas of Samad, Korzok and Kharnak visit each other on festivals and other social occasions as some of them are related to each other through marriage and pledge brotherhood.

### **Kharnak**

The whole area between Khar and Leh-Manali road is Kharnak. It is called Kharnak after an old fort-"black fort" high above the Sora valley. In comparison to Korzok, Kharnak is a small village with an area of 27.5 hectares and inhabited by 335 Kharnakpa, 158 males and 177 females (Census of India 2001). According to the census carried by Leh Nutrition Project in 1993, the community consists of 67 families with a total population of 363. However, more than 25 families have out-migrated to Kharnakling, at the outskirts of Leh in search of education and medical facilities. Dat (Ldad) is a permanent settlement, but is not permanently settled. The very old and children stay here. It is a winter settle-

ment with older stone houses and some newer buildings built by the government lately to ease the life of the Kharnak nomads. There is a main gomba in Kharnak, which facilitates the celebrations of Dalai Lama on his birthday (6<sup>th</sup> of July) when a large number of nomads gather here. This gomba has an important place in the religious life of the Kharnak Changpas. All the Kharnak Changpas have a religious commitment to travel regularly to the gomba in Dat to offer prayers to one of the most important gods. Two Changpas of Kharnak daily throughout the year undertake this long journey on rotating basis. Motorable road has reached Dat; until 2004 the road was up to Zara. From Zara it is a six hours walk to Dat. The nomads of Kharnak, migrate regularly between Khar and Dat. In the summers family members or hired shepherds take sheep and goats for grazing in Lungmoche, Yangang, Spangchen and Zara camps. Yaks and horses are sent to pastures in the adjacent higher valleys. Only the milking female yaks, she-goats and ewes are kept in the main encampment Ldad, which is divided between two localities Dango and Shehyen about 1.5 km. apart. Pogmar is a small nomadic settlement in the Kharnak and the Changpas settle here during autumns. In Kharnak, while in summer, people live in *rebos*, in winter they reside in one room houses clustered in the villages. The whole community occupies a small territory. In summers, they pitch their *rebos* side by side in a row. At their winter quarters, they have a compact settlement with tiny stone houses sharing a common wall. Kharnak Changpas camps are typified by plenty of permanent structures -pits and stone boundary walls, pens, store rooms, sheds, watermills. All these permanent structures are private. They belong to the people who built them, even if they moved away years ago and settled elsewhere. In case, even temporarily, if anyone wants to use the structures, which is not one's own, it is punishable.

Traditionally, besides herding, the Changpas of Kharnak were earning a small part of their living from agriculture and haymaking. They grew barley and peas on patches of land which could be irrigated. Traditionally, these fields were giving good yields as these were grown and looked after appropriately. Since the closure of the border and development of lucrative *pashmina* wool trade, nomads prefer to keep more goats than to grow barley on the stony fields.



In September, just before harvesting, they cut grass from specific valleys that they do not visit throughout the growing season. Due to economic changes and government schemes of forage supply and supply of grains, salt and kerosene oil through Public Distribution System, these fields have not been sown for the last many years.

Before the border dispute between India and China, the Changpas of Kharnak were illegally taking their livestock for winter grazing to Tso-Kar basin, the traditional pastures of the Samad Changpas. After the closure of the border, the Kharnakpa faced many problems as the Changpas of Samad started claiming their traditional rights of grazing their livestock in winter at Tso-Kar basin. Life became difficult for the Changpas of Kharnak as their own traditional winter pastureland have extreme weather conditions. Rupshu (Samad) *goba* donated Yarang-a part of Rupshu plain in the Kharnak valley to Hemis gompa. Hemis gompa in turn gave Yarang to the Changpas of Kharnak for which they have to pay to gompa about 175 grams *pashmina* per goat as tax. In addition, the Changpas of Kharnak are using Spangchen, another area that belongs to Rupshu from the last 30 years. They were facing severe drought that threatened the well-being of their animals and even the ability to survive as nomads. The District Council decided to let the Kharnak people use the grazing area at Zara for 20 days after the 21<sup>st</sup> of June, which is a part of the summer pastureland that lies under the grazing unit of Samad. If they exceed the limit of their stay, they are not allowed to stay there next season. Over the past two decades, out-migration has reduced the size of Kharnakpa by 50. They have been lured away by prospects in the city, having access to proper schools and medical facilities, electricity, warm houses, stores and entertainment.

### **Tibetan Refugees (TRs)**

Another group inhabiting the Changthang area is that of the Tibetan Refugees. In the 1950, Chinese forces invaded Tibet, resulting in the Lhasa uprising in 1959. The Dalai Lama sought refuge in India and since then has been followed by the Tibetans. The Government of India accommodated these Tibetan Refugees in different settlements after the war of 1962 between India and China. The Changthang Tibetan set-

tlement was established in 1982. The settlers of this settlement are nomadic groups consisting of traditional herders who move with their animals. In Changthang, the Tibetans have been rehabilitated at nine different places-Hanle, Chumur, Samad, Lower Sumdo, Nyoma, Chusul, Kagshung, Samled, Puga and Kharnak. The Tibetans of the first five camps practice both agriculture and pastoralism. The Tibetans of the other four camps are pastoralists. At present, the refugees share the pastures with the local nomads, but mostly live in separate campsites or settlements. The cooperative society supplies ration, fodder and other essential commodities. The average distance from Leh city is about 300 km to any of these clusters. More than 2500 Tibetan refugees live in this settlement. A settlement officer, appointed by the Central Tibetan Administration looks after the internal and external matters of the community. Each camp has an elected camp leader who is assisted by group leaders. The camp leaders implement the development programmes in their encampments. Settlement officers work in consultation with the camp leaders. A group leader's job is to act as an intermediary with relevant authorities, pass on information, settle disputes and collect money. Group leaders are chosen on the basis of their personality and their capacity and capability to stand for their villages.

### **Hanle**

Hanle village is a little known Changpa settlement in the eastern Hanle valley bordering China (300km<sup>2</sup>; 32° N, 78° E), a remote area that still needs a permit. Hanley valley is an important area for wildlife conservation. There is a 17<sup>th</sup> century gompa on the ancient trade route that once linked the kingdoms of Ladakh and Tibet. The gompa is not well-maintained and is a crumbling stone edifice where ten lamas live and another 33 come regularly for prayers. In Hanle Valley, world's highest observatory – the Indian Astronomical Observatory is operating since 2001. Enforced isolation has slowed the pace of development and change in the Hanle valley. However, with the start of construction of the observatory in the 1990s, the things started changing. The government facility uses solar generated power and remains in touch with the research institutions around the world through satellite links and the Internet. Access to electricity is still sporadic for most of the villagers. Hanle does



not form part of the study, but is being referred here as a part of the Changthang, which has experienced the same process what other Changpas did. However, they reoriented their economic resources and did not resort to out-migration, as a number of Changpas did.

### Changpas

The people of Changthang, the Changpas are of Tibetan race and are not different from other Ladakhis in their customs and religion. Changpas have a projecting chin, typical Mongolian eyes and large and flat noses. "Long hair, which surely has not made the acquaintance of brush and comb for years if ever, and which ends in a pigtail, surmount faces unaccustomed to washing, but well acquainted with smoky fires" (Heber and Heber 1923). Young ones have started adorning chic, shorter hairstyles in place of their long greasy plaits and trendy outfits have replaced their traditional robes. The Changpas speak *Changkyet/chanskat*, a Tibetan dialect.

The Changpa's ancestors followed an animistic religion called Bon. They were defeated in series of battles and forced to live a nomadic life. After that, they adopted Tibetan Buddhism of *KarGyud-pa* sect. Central Ladakh influences many customs and the religious life of the Changpas. The Changpas of Korzok and Samad narrate the legendary and historical traditions and attribute the creations of the first humans, the mountains around them, the sheep, the goats, horses and yaks and everything they possess to mythical heroes.

These pastoral nomads are said to have moved into Ladakh from the adjoining Tibetan Changthang or from the region known as Zhang-Zhung lying on the western edge of Tibetan Plateau. Throughout the Changthang region, the traditional way of life is nomadic pastoralism or pastoralism with seasonal mobility. This has developed over hundreds of years and the Changpas have acquired an ecological knowledge of their natural environment. Varieties of livestock and grazing land management have enabled them to survive in an extremely harsh environment by seasonal mobility and with the help of a strong social organisation. As Kazanov (1984) aptly described that there is no purely pastoral society; each is interdependent with the larger world, and migration between nomad groups, as well as from town to country, is often the norm. The Changpas are a tribe of tent-dwelling pastoral nomads who migrate in the Changth-

ang sub-division of Ladakh and are associated with other groups through economic exchanges.

The three Changpa communities of Changthang fall somewhere between the categories of nomads and semi-nomads. The three groups share the same way of life raising *pashmina* goats, sheep and yaks on natural pasturelands. Presently, their main source of earning is '*pashmina* wool'. The Changpas have not been referred in the pastoral studies because of their relatively small number but they do exhibit the form of economic and social organisation characteristics of nomadic pastoral societies.

The household is represented by a main and subsidiary tent (*rebo*). It is a basic unit of social and economic organisation. The black tents are pitched over a 70-90 centimetre deep rectangular pit dug in the ground. Next to its dwelling place, each family sets up large stones around which they tie up their yak calves or to which women fix their back-strap looms and the men their fixed heddle looms. Every household also possesses an enclosure to pen sheep and goats during the night. In some encampments, water-mills for grinding grains are seen on the streams running nearby. In order to maintain viability, Changpa nomads adapt to environmental instability and contingent through a variety of social-ecological mechanisms and processes such as mobility, diversity (keeping different types of livestock, exploiting different resources) and common property regimes. The pastures around are all divided between nomad households, regulated internally and defended from encroachment. The grazing pattern of the three communities consist of fixed spatial movements, i.e., the areas used for grazing are the same but duration of stay at a particular pasture may change according to the availability of pasture and water. Each community follows a year round migration cycle, living in tents and grazing their herds of sheep, goats, yaks and horses on communally regulated allotted pastures. They usually make and break a camp about six to ten times a year, making only short moves between a series of camping grounds. Their migration cycle is around various high altitude pastures of Rupshu Rangeland. The nomads of Korzok and Samad used the grazing areas of Rupshu plains including Korzok and Samad. For winter grazing, they used to move towards Skagjung, near Tibet border. However, after the closure of border, they have changed their winter pastures.

The Karzok and Samad communities have been divided into three groups regarding movement pattern. Three-four families from each community are selected on rotation basis that graze the livestock of Korzok and Thugje gumpa respectively, in addition to their own livestock. The nomads of Kharnak used grazing land of east Rupshu called the Kharnak valley. The third group is of Tibetan Refugees, who graze their own animals. All the three groups use the same, different as well as overlapping grazing areas, depending upon the quality of pasture and the availability of water. Changpas use dung of cattle and wild asses and bushes like *rilmang*, *rikpa*, *burtse* and *tama* as fuel. Quantity of water varies in different areas during different seasons. Apart from accessibility of water and pastures, the Changpas also change sites due to disease outbreak, festivals, and social gatherings and localised drought.

### MAKING A LIVING

Rangeland, livestock, manpower and the considerable knowledge of the skills necessary to exploit them effectively are the principle economic resources. The environment is semi-arid and arid grassland, interspersed with ecologically significant wetland areas. Ecological factors and extreme weather conditions of Changthang restrict land use. Like all societies, the pastoral nomads also have a set of institutions that combine natural resources, technology and labour to produce foods and goods. Division of labour, co-operation and labour play their part in the production of food and goods. The climate, the flora and fauna, water supply and vegetation are the controlling factors of pastoral economy, which are used according to the cultural sanctions.

#### Land

Land in Rupshu-Kharnak is managed as a Common Property Resource. Blaiki and Brookfield (1987) define *common property resources* as resources that are "subject to individual use but not to individual possession", has a limited number of users with independent use rights, and have users organised as a "collectivity and together have the right to exclude others who are not members of the collectivity". Many studies have shown that people can work together to

manage common-property resources sustainably (Brombely 1992; McCay and Acheson 1987). Moreover, common property arrangements in marginal areas can provide important resources and benefits for the poor populations. As can be seen among the Changpas and Bhutias of Lachen and Lachung (North Sikkim), where shared rights can lead to a more equitable distribution of scarce or dispersed resources and reduce risk in the face of environmental uncertainty (Bhasin 1994, 1996). Contrary to orthodox economic understanding, common property rights have not led to over exploitation of resources and change in property rights. The pressure of population growth has been identified as an important factor for bringing change in property rights. Traditionally, the region's population was kept under control by practices of fraternal polyandry, primogeniture and monastism. However, with the changes in traditional laws and advent of the Tibetan Refugees in Changthang, the human population and livestock number has increased on land, but has not brought change in property rights.

In Changthang, vegetation is extremely scant, here and there is some green by a spring or along the moistened bank of a stream and other water bodies; and on some hillsides is thin herbage. It is this herbage, which supports the flocks and herds, which in turn sustain the small population of the area. The Changpas have neither crop-residue option nor any institutional arrangement with other communities for grazing their animals as Gaddis of Bharmour in Himachal Pradesh have (Bhasin 1989). The Changpas have only access to their traditional grazing in different valleys in summers and winters. Single resource competitors always have framework to overcome scarcity and conflicts due to internal pressures (population growth, growth in herd size and change of activity) and external pressures (climate changes and environmental degradation) as their resources are limited. Spatial mobility is required to achieve a balance between man, animals and pastures. The organisation of spatial movements is important in pastoral communities. Among the Changpas, these movements are regular and cyclic between the areas of summer pastures and winter pastures.

The Changpas have communal pastureland with strong community regulation of land usage. The Changpas follow the traditional system of grazing where in headman-the *goba* (headman) decides areas for animal grazing.

**Table 1: Land utilisation in the Kharnak, Samad-Rakchen and Korzok areas of Changthang**

Place	Total irrigated area	Unirrigated	Cultural waste	Area not cultivable
Kharnak	9.3	4.1	10.9	3.2
Samad				
Rakchen	2.0	4.5	4.5	2.0
Korzok	20.6	0.4	25.9	11.4

Source: Census of India 2001

In areas where irrigation is possible, the Changpas made an effort to grow some crop.

### Livestock

The Changthang area is home to about 140,000 domesticated livestock, 90% represented by sheep and goats, whereas the remaining 10% are yak (and other crossbreed between Yak and Cow) and horses (Kurup 1996). In 2007, according to official records, the number of *pashmina* goats and sheep kept by Changpas was about 170,590 and 52,549 respectively. The Changpas domesticate a mix of yaks, goats, sheep and horses. Composition of the Changpas herd is not random, but is an adaptive response to environment, which they inhabit, and the resources available to them. The herd of different animals takes full advantage of the use of vegetation in the same pasture as different animals graze on different plants making efficient use of resources. Different animals also provide diversified products for self-consumption or sale. The flocks must include sheep and goats as producers, yaks to transport the belongings on the migrations and a dog to guard for the herd and tent. Traditionally, the Changpas raised large herds. Raising large herds was a part of strategy to sustain breeding herd with a sufficient number of females in milk at any time of the year. In 1960s, the wealthy nomads had large herds with around 1,000 sheep and goats, around 100 yaks and 15 horses and poorest households had 150-200 sheep and goats, four yaks and two horses. In 1990, an average household had about 300 sheep and goats, five-six yaks and a few horses. However, there is increase in number of goats because of increase in value of *pashmina*. Although sheep produces more wool, they as compared to goats are less hardy and give less milk and meat. Goats are also able to live on poorer pastures than sheep, but at the same time tend to destroy the pasture after they have grazed for a certain length of time, as their sharp

hooves cut the turfs, exposing the top soil, which is blown away by the wind. It is feared that this shift can lead to degradation of rangeland decline of pasture quality. The mortality rate for goats is higher than that of sheep, so the higher number of goats reduces the risk of individual household.

As the area abounds in wildlife as well, there is interaction between domestic livestock and wildlife in selected areas. The existence of competitive and interference interactions between wild ungulates and livestock husbandry is cause of worry for the Changpas as well as conservationists.

### Human Labour

The three Changpa communities inhabiting these vast rangelands of Changthang are small in number. The Korzok with an area of 58.3 hectares and 72 households is inhabited by 1209 pastoral nomads (643 males and 566 females). Out of this 882 (447 males and 405 females) are Changpa nomads (Census of India 2001). Samad-Rakchen with an area of 12.6 hectares and 98 households is inhabited by 517 (280 males and 237 females) people. The area is inhabited by the 365 Changpas (198 males and 167 females) and Tibetan Refugees (TR), who came here after 1960. At the time of Hagalia's field work there were 60 families with 300 members of the Changpas and 22 families with approximately 150 members of the Tibetan Refugees in 2002-2003 (Hagalia 2004). In comparison to Korzok, Kharnak is a small village with an area of 27.5 hectares and inhabited by the 335 Kharnakpa, 158 males and 177 females (Census of India 2001).

In Changthang, as in other parts of Ladakh, every male, female, adult and child, if he/she is physically fit and old enough to work, participates in economic activities. Men and women both contribute towards household economy participating in herding, processing the animal products (milking, combing of *pashmina* and wool, spinning and weaving); household work (cooking, washing, cleaning, bringing water and fuel etc.); trading; child-care and socialisation of children; social obligations and village duties.

The division of pastoral labour responsibilities is organised by sex and age. Men's work has generally been associated with herd management and women's work with the children and house. The pastoral gender division of labour assigns women few major herding respon-

sibilities over large stock. However, Women are closely involved in caring for young and sick livestock as well as for animals kept near the homestead. In addition women and children also herd sheep and goat, while men are away for *pashmina* combing in July. Men can and do carry out feminine tasks of cooking and caring for children, and women can and do assume male tasks, especially when men are absent.

The Changpas depend on natural resources, particularly for fuel, fodder and water. Women look after collection of all the three. In Changthang the women collect animal dung, which is used as fuel as there are no forests in this cold desert. At campsites, the animals are tethered in *les*. It takes months for one group to return to the same spot. After settling, the women collect animal's dung, and use it as fuel especially when it is scarce during the long winters.

The women actively take part in milking along with males besides processing the milk into storing form – butter, *churpi* etc., that are to be exchanged for grains in the subsequent time. In addition to processing of milk, pastoral women also process the wool, fibres and hides. Among the Changpa nomads, though women are involved in all spheres of pastoral life and their involvement in their subsistence economic activities is much bigger, they are not given the portfolio of trade.

The socio-economical relevance of the Changpa women and their contribution in livestock production in the study area is only supportive. In all the three communities, milk production does not generate a surplus above household and herd consumption requirements, the women do not benefit by taking it to local markets and to small town processing centres. The Changpas are far from trading towns and cities and women do not participate in all stages of economic production. The Changpa men indulge in salt and *pashmina* trade and women keep out of it. These women do contribute to household economy but are not part of the pastoral production. The Changpa women apart from performing their household duties, take on small business, run shops or work as porters as and when need arise.

Absence of infrastructure and preservation technology has so far prevented the most women's direct access to urban consumers. However, presently by the Integrated Rural Development Programme and Allied Programme, the

women are helped in self-earning through improved weaving technology. It is true that these interventions have created more work for these already burdened women but have enhanced their economic value.

Disposal of animals and their by-products are looked after by the men. Though the women do not directly indulge in trading, they too get involved sometimes. In the absence of men, traders come and talk to these women who convey the negotiations to their husbands. As such, the women do not have marketing links. However, sometimes their woven things are picked up by some non-government organisations. They sometimes serve consumer's needs by a chain of middle men who act as intermediaries between producers and consumers. In summer and autumn months, shepherds have to make longer movements for the livestock grazing.

#### **Characteristics of the Traditional Productive System**

Animal husbandry is a way of life, and the Changpas whole existence revolves around the migration of their flocks in search of pastures. Their production system involves raising yaks, sheep, goats and horses; harvesting their products; paying a portion to gompa as taxes; consuming a portion; and bartering yet another portion along with salt to obtain grain and other necessities like tea and other consumables. The Changpas follow a number of conscious strategies which aim at coping with the hazards of pastoral life and survival in the cold desert. As environment is not conducive to any other form of land use, no grazing land is irrigated, fertilized or sown. Animal husbandry in Changthang is found effectively exploiting the single short growing season during which, both frost and dry, high-velocity winds are common. In Changthang, green foliage appears in late April or early May on snowmelt or spring-fed wet meadows, riverbanks or lake banks that just covers a small part of the summer grazing area.

Diversity and mobility characterises the pastoral productive system of the Changpas. The strategies of the Changpas include the manipulation of the natural resources through livestock management (species diversification, herd disposal, herd maximisation), mobility, building up of social exchange networks and systems of risk-sharing. During the summers, yaks are set free in mountain pastures. The female yaks (*bri*) ewes and female goats are kept with households and taken out each



day for grazing. The winters are difficult times for human as well as livestock population. The Changpas rely almost entirely on standing forage during winter. The livestock are fattened as much as possible during the summer, so that they can withstand the long winter with only scant vegetation, supplemented by fodder that has been cut locally or purchased ahead of winter. Different animals also provide diversified products for self-consumption or sale. In terms of productive roles, yaks are main milk producers as they have long lactating period. Goats and sheep are kept mainly for *pashmina*, wool, meat and barter. Only during difficult times, they resort to selling goats. They slaughter animals from the flock before the winter, so as to avoid wasting scarce fodder on animals which have outlived their usefulness. The Changpas keep few pastures to be used in case of emergency.

#### Animals and Their By-products

The Changpas rear yak, an animal splendidly adapted to high altitude (thin air and low atmospheric pressure) and cold environment of Changthang. Yaks are uniformly brown or black in colour. If by chance a white yak is born, this is dedicated to high Lamas. Yaks are given nose ring to help control while working. They raise yaks for their transportation value, milk and butter, meat, hide, wool and hair. A female yak gives milk throughout the year, approximately between 100-110 liters annually. In the periods of maximal production of milk, the Changpas consume it fresh and process some for storage. By processing three liters of milk, the Changpa women make 250 grams of butter. However, quality and quantity of butter depends on weather conditions, pastures, fertility of the female (one calf every second year) and the feed for the livestock. Their coarse belly hair (*stipa*) is spun and woven into tent material and Changpas use their soft wool (*khullu*) for making ropes and blankets. The Changpas cut these long black hairs of yaks only after they attain their full length. Yaks provide heavy transportation and have great endurance to extreme cold weather.

The Changpas domesticate *huniya* sheep which provide food, clothing, and hides and carriage. The sheep give milk from June to August. This big-boned animal lives comfortably at 4,500 metres thriving on the scanty grasses and desert plants. It gives large quantities of rather coarse wool, used for making clothes for self-con-

sumption and its long staple serves as a raw material for carpet industry. Its value as pack animal is of importance. Because of its larger size and height, sheep helps in carrying salt from the lake site and in exchange of salt, it helps in bringing grain.

The most important animal of the Changpas' herd is *Changra (pashmina)* goat, the products of which provide the main subsistence. *Changra* is a small goat of longhaired species. The *lena* wool from which the beautiful *pashmina* shawls are made is soft, silky undergrowth at the root of the long hair of these smaller goats.

Each household keeps at least, one or two horses, which Changpas use for riding and as transport between the settlements, to other villages or for visiting gompas of Korzok or Thugje. The horses are expensive to keep, as they have to be stall fed for nine months in a year with two kilograms of fodder daily. Horses play minor role in the Changpa economy, but are kept for prestige and as a symbol of wealth. Changpas domesticate large hairy dogs for controlling their livestock. They guard the encampments at night, and warn the community of the presence of wolves or snow leopard. They do not like strangers roaming near their encampments.

#### Seasonal Work

To all intend and purposes, there are only two seasons in Changthang, as in rest of Ladakh; a short torrid summer and a long icy winter. The winter, which lasts from September to May is, devoted to spinning and weaving, food preservation and religious activities. In summer season, Changpas are busy combing *pashmina*, cutting sheep wool, spinning and weaving, milking and processing milk.

During November-December, the three Changpa communities arrive at winter camps near their respective permanent winter villages from where they make well-established moves with their livestock to nearby pastures. In December, arrangements for the *losar* (Ladakhi New Year) festival are made, which goes on for five days. They slaughter animals. Slaughtering at this time of year is for self-consumption as well as marketing. January is the time for lambing and February for kidding. The Changpas are busy taking care of pregnant females and their newborns. Due to cold and adverse weather conditions, mortality rate is very high. Apart from helping



men in their work and normal household work, women assemble outside the *rebo* for spinning and weaving. While the men take sheep and goats to graze, the women clean the *les* to collect dung and wool. The men and women follow normal routines- looking after household work, grazing livestock, spinning and weaving. February to April is the tough time due to snow, blizzards and consequent starvation.

In the beginning of May, they start preparing for summer grazing. The heavy clothes, heavy tents, and equipment not going to be used in summer are set aside for store houses. During summer months, the Changpa women are busy milking the sheep and goats and processing the extra milk into various products in addition to routine work. The men are busy combing *pashmina* and cutting of sheep wool. The women take care of milk and men take care of *pashmina* and wool.

During the months of August and September, the Changpas head towards Korzok gompa and stay together for prayers and religious ceremony. For this ceremony, the men have to make preparations for the religious sermons to be delivered by the Korzok head lama. In November, the preparations for winter quarters begin.

### Work Schedule

The work schedule for the Changpas varies for summers and winters. This routine keeps on changing for the women according to season. In summer, the women get up early in the morning to make *gur-gur* tea for the men, who take animals out in the morning. The Changpas graze their animals in two groups. In one group sheep and goats are taken and in another the female yaks. Both groups graze at a distance. The old men and women with small children stay in the *rebo*. They milk the animals before the animals go out for grazing. In summers, the herders' come for lunch to their respective *rebos* by 11 in the morning. The old men and women at *rebo* milk the sheep and goats. After milking they are again taken to pasture from where they return to *rebo* in the evening. During the time when the men take animals for grazing, the women in the *rebo* finish their domestic work and weave and the men at home make ropes and complete other odd jobs. Lambs and kids are herded separately from adults. Herders return in the evening and separate sheep and goats according to their

age. Kids and lambs are kept in separate area, so that they cannot drink milk from their mothers. Kids and lambs are tied up to avoid their wandering or disappearance. The women milk sheep and goats. During milking the sheep and goats are tied necks to neck, but with alternate heads looking in opposite direction. After milking, they are freed by simple expedient of pulling the end of the rope. Each member helps while settling down the animals for night. Summers is the time of maximal production of milk, it is taken fresh and is also processed. Women are busy processing extra milk, which can be stored and utilised/bartered when the need arises.

In winters, the women get up a little later and shepherds return a little early. They do not return to *rebo* for lunch. The shepherds take some *tsampa* and tea for the pastures while others have their meals in the *rebo*. The women clean the pen and collect dung to be used as fuel after drying. During the day time, the women sit outside and weave in the sun. In the evening men go up in the hills to collect yak dung and plant roots to be used as fuel. At the start of the winter, animals are slaughtered for meat, which is eaten fresh, smoked, salted or dried to be used in future.

### Shearing

Wool is shorn once a year (in late July). The yield is about half kilogram per animal. The Changpas use sheep wool, goat hair, and yak hair and yak wool for weaving. They start with combing of *pashmina* from the goats in late May, followed by removal of hair and wool from Yaks and ends with shearing of sheep. The Changpas do not use *pashmina* themselves but sell it. Wool is spun in to thread. Shearing is finished before the annual prayer ceremony that falls around the end of July or the first week of August. They start selling *pashmina* only after the completion of the annual prayer ceremony, which lasts for ten days. At the end of the ceremony Lamas burn thread crosses (*mdos*) to symbolise the expulsion of the previous years' sins.

Shearing the sheep, combing *pashmina* out of the goats, cutting goat hair, and removing hair and wool are male occupation. It is a major event and work teams *deb-she* (reciprocal agreement of physical labour or goods) is prearranged. These work teams are planned only for sheep shearing; rest of the shearing is by family members only. Each family owns implements for shear-

ing and combing pashmina (metal shears for cutting wool, as well as goat and yak hair; comb for removing pashmina). The traditional combs were locally made from yak horn or wood. Today, however, these traditional combs are not in fashion; instead, combs made of steel are used. The comb consists of heavy wires bound together by finer wires, and each line is curled at the tip into a hook. The *lena* as it is combed out contains an admixture of coarse hairs as well as dirt and the animal's bodily secretions. After combing, the animal's shaggy outer coat, made up of coarse hair, is cut with metal shears. The Changpas remove *pashmina* by combing. During winter, it lies close against the goat's body, providing insulation against the bitter cold. After the completion of winter months, as the goats eat new grass that *lena* rises above the surface of the animal's body and can be combed out easily. Changpas comb few goats at a time, generally in the morning before they leave for the pastures and some times in the evening as well if there is sufficient light. The *lena* is removed in stages to keep the animal warm, and save it from exposure. The sudden cold can be injurious to goats' health. The *lena* from old and frail goats is removed in the last till end of August. It is said that the pashm grows faster on stronger goats, while on the less robust it takes time (for further details see Bhasin 2012).

The Changpas accord special reverence to the sacred sheep<sup>2</sup>. They leave a tuft of hair uncut on the upper back, so that they can be easily distinguished from the rest of the flock. This bears a resemblance to the offering of scarves to these particular goats. The same is done for the consecrated sheep at the time of shearing<sup>3</sup>.

### *Lambing*

Lambing in the Changthang takes place in the months of February/March every year when the weather is extremely cold and harsh. Because of the extreme cold at this time of the year, mortality rate is high among newborn lambs and kids. To avoid freezing of newborn kids, they dry them up immediately with dirt. During lambing, the Changpas sleep nearby the pregnant females of the herd, so that they can take steps to save kids there and then. A large number of lambing sheds have been built in various parts of Changthang, to reduce the mortality rates. These sheds are built at the place near the camps of the

herders at the time of lambing. For weaning, they keep the lamb temporarily in a different flock from that of its mother.

The Changpas face many constraints in breeding, feeding, keeping *changra* goats in good health and even marketing its products. There are no buck exchange programmes as breeding buck user groups have not been formed. Besides the natural constraints like adverse climate, extreme aridity, wider temperature fluctuations, scarce precipitation, the livestock suffers from malnutrition. Shortage of dry and green fodder results in high mortality rates.

### *Slaughtering*

The Changpas resort to slaughtering mainly in the beginning of winters as it serves so many functions. Animals are healthy at this time of year after summer and autumn grazing and are slaughtered before the *losar*, their New Year. It is a tradition as well, as it provides meat in large quantities for festival feasting. When a yak has to be slaughtered, two-three families mutually slaughter a yak which they share and in exchange, a small sum of money is paid to the owner. Yak meat forms an important part of their diet in winter months as accessibility of milk is reduced. Consumption of meat is reduced in summer. They eat dry meat from winter slaughter or fresh meat is taken in case of injured or weak animal.

Sacrificial slaughtering takes place as family ritual in order to protect individual members against adversity or to purify them when they have broken a rule or taboo. Many social activities are accompanied by the sacrifice of animals.

### **PASTURE ALLOCATION AND PASTORAL CYCLE**

Unlike much of Central Asia, where command economies over-ride traditional access rights, the Changpas have communal pastureland with strong community regulation of land usage. The Changpas of Korzok, Samad and Kharnak have their traditional summer and winter pastures. A unique feature of the traditional pastoral system is the complex administrative system of pasture allocation and reallocation by the *goba*. The *goba* has a list of all the pasturelands and the families who have access to particular pastures. He allocates plots of pastures to individual households, which then have exclusive usufruct rights over them for a giv-

en period. The Changthang is divided into number of named pastures of varying size, each with delimited borders recorded in register book. The boundaries separating the grazing grounds of one village from another often follows physiographic features like rivers or ridges. The Changpas tactically make *lha-tho* at such places where there are no natural features to mark boundary lines. Even then, at times, transgression of the inter-village boundaries leads to disputes. The *goba* and members at the block level solve these disputes. The Changpa households can use only their assigned pastures. Each pasture is painstakingly suitable for a fixed number of animals calculated locally on their own system. Thus, access to pasture with particular characteristics is allotted to a particular household with some combination of animals, totaling to a specified number. Each pasture is expected to sustain only what is considered an appropriate number of livestock. Triennial censuses of adult animals determine each household's herd size and its allocation of pastures and taxes. Additional pastures are allocated to household whose herds have increased and are taken from those whose herds have decreased. The whole area under his control is divided in to two zones—one for gompa animal grazing and the other for community animal grazing. Every year three families selected by *goba* in rotation take *dkor-* gompa's livestock for grazing with their own herds to allotted pastures (*lungtung*). The community and gompa animals graze at pastures, which are far off from each other. In addition, one selected family has to take all community as well as gompa horses for grazing. The gompa animals graze on the best pastures and so do the animals of the caretaker families. The families who look after gompa animals are in an advantageous position as their animals have good graze, along with gompa animals. The community's pastures are strictly guarded and the locals exercise the right to fine any outsiders who illegally graze their animals there. The whole community separates in summer and frequent distant pastures, but reunites in winter. The annexation of Aksai Chin by the Chinese during the war of 1962 led to many changes in the life of the Changpas. Historically, Aksai Chin was part of the kingdom of Ladakh, which had either remained an independent kingdom or under the rule of Kashmir. Prior to this war, the Changpas of Samad and Korzok had their winter pastures at Skagjung near the border. Due to the loss of this rich winter pastures and arrival of Tibetan Refugees with their

livestock in Changthang, the Changpas of Samad and Korzok were required to alter their migration pattern, frequency of moves and reducing their herd size. The Samad Changpas faces another difficulty regarding winter grazing. While the Samad Changpas were visiting Skagjung pastures, their traditional pastures near Tso-Kar were being used by the Changpas of Kharnak. However, this conflict has been resolved to some extent, but the Samad Changpas are facing difficulties in forcing them to move out of pastures near Tso-Kar.

### Pastoral Cycle

The organisation of spatial movements is important in pastoral communities to achieve a balance between man, animals and pastures. The movement pattern of the Changpas of three communities consists of fixed spatial movements and flexible sequential movements. Among the Changpas, these movements are regular and cyclic between the areas of summer pastures and winter pastures i.e. general areas used for grazing remains the same year after year. Each move and stay at a place depends on the availability of grass and water. As soon as they notice the reduction of water and shrinkage of pasture, they convey the information is immediately to the *goba*. Apart from the availability of water and pasture, the Changpas change sites due to disease outbreak, festivals, and social gatherings and localised drought. The decision of breaking a camp is taken in advance by *goba* and his advisory committee. He calls a meeting and explains the next move. Each family starts preparing for the next move. The Changpas move with their bag and baggage (tents, stove, food, clothes, carpets and other household items). They keep extra food and equipment not needed immediately in the store houses in the winter villages. The day of departure is decided beforehand; as all the camps are supposed to dismantle in one go<sup>4</sup>. Few Changpas are sent to collect yaks and horses pasturing in the higher valleys. The yaks are rounded up and loaded. They take out saddle bags and wash clothes etc., if a water source is nearby. If the water source is far off they wait for the next stop over. Carpets and blankets are laid across their backs, followed by stove, butter-tea maker, and handmill. One yak carries a steel trunk which contains religious objects, altar and religious books. Two yaks carry the two folded halves of tents.

The yaks are driven in front, followed by the women and children. The men in the rear lead the horses. The Changpas move camp early in the morning and reach the new camp site by noon. As the Changpas move in groups, the individual difficulties or circumstances of a household does not count. If a move has been planned for a particular day, the group will depart on that day at the fixed time. They complete the journey to next campsite in two stages. The first batch leaves the camp two days before the rest of the camp follows. In the first batch, each family sends a part of their belongings with two or three family members to the new camp, the rest tag along on the selected day. This is done to ease the situation for families, who do not have enough yaks and horses to carry the possession in one go. Out of two three family members, two will stay at the new campsite to guard the possessions and one returns with yaks and horses for the next round. Men mainly pitch the tent, though women and children may help. The tents are pitched besides the pens meant for livestock. The enclosure and pens are private properties of the individual household. They belong to people who built them.

During migrations, the staple diet of the Changpa remains milk and milk products (curds, buttermilk, butter, cheese and whey), meat( including blood and organ meat), and *tsampa* (roasted barley flour).

The Changpas invest major part of their labour in the care of their flock, in increasing them and building them up. As soon as a man's herd passes a certain minimum threshold, which is essential for his and his family's survival, it starts growing. However, as the size of the herds' increases, its net productivity rate for the owner declines. No effective means have been developed among the Changpas to protect the rights of the big herd-owner. In cases, where the profit margin increases, the Changpas tries to convert the net profit into stored wealth, mainly carpets and female jewellery. Most families wish to have a certain amount of such goods to exhibit as status of symbol and wealth, but wealth in this form gives no economic returns.

#### **WHAT DO CHANGPAS PRODUCE AND HOW DO THEY MARKET IT?**

The products derived from sheep, goats and yaks are milk, meat, wool and hides. The Changpas obtain and process these products. They

consume some of these products directly; store and consume or trade these for other consumables. Their main economic strategies are of conserving temporary abundance into storable form that can be utilised throughout the year. The supply of milk year round is not uniform as sheep; goats and yak give different amounts of milk and for different duration of time. Sheep and goats do so for only part of the year, sheep for only three months and goats for four-and-a-half months in summer. Only the female yaks give milk year round. They keep yak cow (*Brimo or Demo*) only for milk.

The Changpas mix sheep's and goat's milk during milking, but yak cow's milk is kept and processed separately. The *Dzo-mo* yields more and much richer quality of milk than the yak cow. The Changpas, consequently transform a large portion of summer milk into butter, clarified butter, fermented butter, solidified dried curds, and cheese, which can be stored for self-consumption or for barter when the need arises. During migrations, the Changpas do not prepare cheese. The processing technologies are simple and because of extreme cold, the elaborate refrigeration technologies are not required. By simple pressing in gauze-like bag they separate curd from the sour whey; this curd is then roll into walnut-sized balls and dried in the sun for storage. They discard the sour whey or feed it to dogs. The Changpas in the cold desert are distant from arable lands and markets and have no opportunities for sales. They barter these products for barley and consumables from settled communities in neighbouring areas.

As summer is the time of milk producing, winter is the time for meat abundance. Meat preservation activities vary widely among pastoralists, reflecting both the seasonality of slaughter and access to markets. At the start of winter, the Changpa slaughter mostly males or small kids. The number of animals slaughtered for food varies according to the wealth of the household. Yak's flesh provides large quantities of meat. They eat meat fresh, smoked, salted or dried as or when the need arises. The Changpas usually match the species slaughtered to the occasion and consume all the meat before it goes bad.

Livestock fibres and hides are of substantial economic importance. Changpas produce sheep wool and some of the finest *pashmina* fibre in the world. Sheep give large quantities of rather



coarse wool, used for making clothes for self-consumption and its long staple serves as a raw material for carpet industry. *Pashmina* fibre has promoted the famous shawl industry run by Kashmiris, who have traditionally dominated the acquisition of *pashmina*. Sheep wool and *pashmina* fibre from *changra* goats are high-value products that do not face significant competition from any equivalent external products. The evidence is that globalization of the trade has caused wool and cashmere production to expand.

Almost all of these products can be harvested from time to time, but hides can be acquired only after slaughter. The Changpas are more concerned about their livestock survival than the processing of hides that is why these are often of little market value.

The hides of the slaughtered animals are valuable and useful to Changpa themselves. They are plucked and turned inside out and used as storage bags for — *tsampa*, water, sour milk and buttermilk. They make containers for keeping butter etc. from the skin of the kids.

#### MARKETING PASTORAL PRODUCTS: PAST AND PRESENT

The Changpas obtained a great number of the necessities of life by trade, which included both agricultural and industrial products. Cash played a minimum role in the Changpas' lives and household economies. Rather the emphasis was on co-operation among families according to understanding of mutual support and reciprocity. The Changpas trade or barter with their trading partners in sedentary villages. Each Changpa had stable relations with a number of such trading partners in sedentary villages along the migratory route of his section. To buy these things, they sell butter, cheese, *pashmina* goat wool, sheep wool, lamb-skins, hides, occasional livestock, salt and small amounts of borax and sulphur. Almost all the products they sell come from their flocks except borax and salt, which they obtain from Puga and salt Lake District, respectively. Likewise, the Changpas have lived a somewhat symbiotic relationship with the traders, who make their living by buying and selling the *pashmina*. The dealer who regularly comes to a particular village is well-regarded by the residents. He often gives advance payments on the wool in winter before the *pashmina* is even taken. These traders and their forefathers have dealt

in trade with the Changpas. These people have developed a close relationship going back generations. The price of *pashmina* fluctuates up and down. However, this ancient system, where the Changpas depended on the dealers is now out of date. Now the Changpas have set-up a *pashmina* co-operative with the government of Ladakh, who purchases most of the *pashmina* wool at a set price. Out of habit, Changpas still sell best quality wool to the dealers, from whom they can sometimes manage to get the higher prices than from the co-operatives. The social system of the Changpas due to imposition of grazing boundaries limits societies to bounded regions. However, this does not imply that Changpas are not part of the large scale economic and political structure.

Traditionally, the Ladakh's geographical position at the crossroads of some of the most important trade routes in Asia was exploited to the maximum. Fortunes can be made more easily at cross-roads than at destination. In spite of being a high altitude terrain, until 1947, Ladakh was the centre of a network of trade routes. The Ladakhis collected tax on goods that crossed their kingdom from Turkistan, Tibet, Punjab, Kashmir and Bal-tistan. Few Ladakhis were engaged as merchants and caravan traders, facilitating trades of textiles, carpets, dyestuffs and narcotics between Punjab and Xinjiang. The flexibility of the pastoral nomadism and the ability to transport goods and people associated these pastoral nomads with trade. The Changpas were involved in caravan trading- guiding, managing and supplying the appropriate livestock. However, with the introduction of the modern transport, the economic importance of such trade has lessened.

Apart from this long distance trade route in luxury goods, there was a local inter-regional trade, more fundamental to Ladakh's economy. The operators of this trade were individuals from several hundred households, who regularly took grains from their fields, loaded it on donkeys and carried it to the high altitude plateau of south-east Ladakh and western Tibet, where the Changpas grazed their huge flocks of sheep and goats but grew no crops. These traders bartered their grains for *pashmina*, wool and salt, which they took to Skadru in Baluchistan and exchanged wool and salt for dry apricots.

The Changthang (Rupshu valley) was the central point where traders from Lhasa came annually with brick tea and salt for Leh; from Sutelj Valley came the Kuns (people of mixed Tibetan and Indi-



an breed) and from Lahoul and Kulu came traders with grains. The Changpas acted as forwarding agents. All their domesticated animals with the exception of *pashmina* goat carry loads.

In addition to brick tea and salt, another important commodity that was coming from Tibet was *pashmina*. The closing of border in 1962 which brought an end to *pashmina*'s export was a blessing in disguise for the Changpa's *pashmina*. The demand for the Changpa's *pashmina* increased overnight and the Changpas economy took a new turn.

At present, the Changpas trade animals and animal products, *pashmina* being the most important. Each Changpa household is an independent economic unit. Each household must deal with agents of impersonal market. They adapt to this by establishing ties with village traders through which they transact economic exchange. The economic transaction of the Changpas with sedentary markets take two forms: cash sales and purchases in the bazaars of the larger towns of Kulu, Srinagar and Leh, and barter relations with personal trading partners in small villages of Zaskar and sedentary villages scattered along the migratory routes. Marketing of *pashmina* is an important factor in the economy of the Changpas because it is subjected to political factors. Jammu and Kashmir government restricts the free movement of *pashmina* outside the state. This regulation stems from treaties dating back to 1684, which gave the monopoly of *pashmina* wool to Kashmiri merchant. These traders effectively control the market. Attempts to break this monopoly have met with failure in the past. Direct sales of *pashmina* goat's wool and sheep wool represent a major portion of the turn-over of the Changpa household. About 70 per cent of the total wool and *pashmina* is sold to Ladakhis at Leh market and afterwards it is sold to the Kashmiri merchants who used to be stationed at Spituk near Leh. The wool is brought to Kashmir for processing and making into the world famous Kashmiri shawls. The rest of the ten per cent wool is sold to merchants from Himachal Pradesh and the remaining wool is for self-consumption. Sometimes, buyers from Kashmir and Leh visit the area and deals are transacted individually after much haggling. The Changpas are eager to sell to these agents, since they feel that the price they get in the bazaar is lower than what they can obtain in their own area. The Sheep Husbandry Department (SHD) of Jammu and Kashmir government has established programmes to en-

sure fair market access for *pashmina* producers through the formation and strengthening of *pashmina* growers' co-operatives; to improve the genetic quality of *pashmina* goat through selective breeding and the distribution of breeding stock; and to improve the health status of *pashmina* goats through improved veterinary care. The Ladakh Autonomous Hill Development Council (LAHDC) has sought the support of central government authorities to negotiate fair trade practices with Kashmiri lobby. As a result, the council has been able to negotiate supplies of processed *pashmina* from Ladakh for purchase for Kashmiri industries, which will form a foundation for the promotion of a successful network of marketing and processing co-operatives in Ladakh. In Changthang, 22 co-operatives are working at the village level and the members are receiving primary training.

Earning cash has become important in the Changpas economy as they need cash to buy grains from PDS and other necessities of life from the Leh market. Earlier the Changpas were trading salt as well. However, with a steady supply of ready made salt in plastic bags from the city, the salt extraction is for self-consumption only.

Like other nomads of the world, the Changpas have also been associated with another type of trade-smuggling. The consolidation of natural borders between neighbouring countries and the imposing of contradictory tariff has made these pastoral nomads as an ideal group to smuggle contraband between these countries. Smuggling of scarce consumer goods is common in this region.

## ARTS AND CRAFTS

In the further processing of some of these raw products, certain skill and crafts are required. For this, they are dependent on their own devices in the production of the products for self-consumption. The Changpa men and women weave gender specific articles on gender specific looms. The women weave textiles for use as clothes; blankets; containers for food and valuable possession; saddle bags for holding personal belongings; covering for floors, tent walls, and saddles. The men weave blankets, saddlebags and tents. They sell *pashmina* fibre to traders and do not weave articles from it. The *pashmina* fibre is very fine and difficult to weave. The Changpa men weave saddlebags, blankets and the tents,

but they neither use dyed yarn nor make any pattern. They weave blankets of goat and yak hair, which are very warm, and help the shepherds in meeting the harsh climatic conditions. The Changpa women weave in summer months, from May/June to October/November. The Changpa women mainly weave woolen fabric-*snam-bu* combining lamb and sheep wool for making garments. *Snam-bu* is generally plain white, natural brown or black. Nowadays, with the availability of commercial dyes, other colours are also available. The women also weave containers for food, saddlebags, blankets and carpets with simple designs of stripes, religious symbols and dice patterns. ( See Ahmed 2002). The women weave on a back strap loom (*Sked-thags*), and the men use a fixed handle (*Sikpa*) loom (*sa-thags*).

### Salt Trade

Tibet supplied most of the Himalayan region with salt. The Tibetan Changpas brought salt into Ladakh and the Rupshu nomads went to collect salt themselves (Chaudhuri 2000). Before the closure of the border, the Changpas of Korzok and Samad went to Skagjung for winter grazing of their livestock. Along with grazing their animals, some of them also went to MIndum and Kyeltse salt lakes in Western Tibet to collect salt. According to Ahmed (1999), herders brought 200-300 sheep to salt lakes for carrying the salt on their backs. After the Sino-Indian conflict, a huge portion of winter grazing was lost to the Changpas. The Changpas of Korzok took their livestock for winter grazing to the rangeland of Korzok, while the Changpas of Samad returned to their hereditary pasture in the Tso-Kar basin that was being used illegally by the Changpa of Kharnak in their absence. This led to a conflict between the two communities over the rights to pasture. In 1982, an agreement between Kharnak and Rupshu was signed under the supervision of Assistant Commissioner of Nyoma that Rupshu had to support Kharnak with 8,000 kilograms of salt annually, while Kharnak had to pay 400 Indian Rupees. The agreement expired after years and this again led to violent fights between the two groups in 1987 and 1988 (Ahmed 1999). After this the case went to court and in the end Buddhist association decided the case that only Rupshu had access to Tso-Kar and they should provide Kharnak with 800 bags of salt in exchange for 25 paise each bag. According to Ahmed (1999),

the conflict was more about the grazing land than salt as Tso-Kar provides the best grass and trespassers may encroach the area with grazing livestock with the excuse of being 'salt thieves' (for further details, see Ahmed 1999)

In the past the Changpas from Khamak and Rupshu came down to Zaskar region with caravans of thousands of sheep each carrying about 15 kilograms of salt in small saddle bags and these they traded for barley and peas. They came twice a year, in July and September, the journey taking a month each way, the salt being dug from high altitude lakes in that region. The people of Zaskar were compelled to buy salt from the Changpas if they wanted wool from them. The wool from Changthang is of long staple and much in demand by the Zaskaris for making cloth for *Gonchas*. Both trades survived the initial impact from the road. However, the Changpa trade from Kharnak has since stopped. The Changpas can take their salt by truck, thus saving months of grazing journey into Padum in Zaskar. After the closure of the border, the Samad Changpas started collecting salt from the site at Tso Kar's south-east end. They collect salt in September and October and barter these for barley and cash in Leh and Zaskar. However, rising water levels drowned this site too after 2000. These people are buying ready-made salt in plastic bags from the shops. However, the Changpas still sell wool of sheep and goat and sheep and goat for meat at Leh market.

### Indigenous Practices, Interventions and Sustainability

Livestock grazing in the Changthang, could survive through the centuries because of the indigenous practices which maintain the livestock ratio and to avoid overuse of some pastures or low use of others (confining grazing of horses and yaks to separate pastures, herding sheep and goats together, avoiding simultaneous disturbance of pastures). As the Changpas' pastoralism is based on yaks, goats, sheep and horses, this diversification strategy stimulates a complete use of vegetation resources; it serves the different productive roles of livestock; and it reduces the risk of herd depletion in times of disasters. Different animals have different eating habits.

Changpas lead a nomadic existence; however, relatively rich families maintain a permanent home

in Rupshu, the largest settlement of the area. Whole families move with their flocks of sheep, goats and yaks from one pasture to another; retreating to the shelter of the valleys in winter, though in cold season these retreats are inhospitable by the standards of the other nomadic communities of the Himalayas. The Changpas have evolved an indigenous and effective rangeland management system that involves reserving certain pastures for winters when snow covers higher grazing areas and regulating communities' movements according to the pasture conditions. These winter pastures are in the region where there is less snowfall and the *goba* do not bring these pastures in rotation during the summer months.

The Changpas move along with their livestock annually between at least two encampments with associated pastures. Almost all nomads have a base, usually in a traditional winter village from where they make well-established moves with their livestock to seasonal pasture. The number of moves from winter to seasonal pastures depends upon the availability of water and fodder. The migration sequence enables the nomads to utilise the different pastures in their growing period. Herd dispersal and division of livestock into production – species-specific units is another strategy to minimise the risk of climatic fluctuations. Often, households move parts of their herds, say, male and non-lactating sheep and goats to a secondary satellite camp at other pastures and in a different season pregnant females are moved to another satellite camp, depending on availability of pastures and labour to do so. This system applies only to sheep and goats. Male yaks and horses are left unsupervised in the mountains during winter until they are needed for transportation. During summers, Yaks are kept in *doksa*. In autumn, the female yaks are herded daily and move with the sheep and goats. In winter, the female yaks are moved to mountain slopes to forage there. However, yaks are not generally more than one or two days away from base camp. According to the Changpas, their traditional system has allowed them to survive on Changthang Plateau for centuries without destroying their resource base precisely because it fostered a balance between their highly adapted herds and the harsh environment. This also justifies the individual herd management strategy.

Predators attack many of their animals. The herds are kept in pens, as these are prospective targets of predators. The animals are generally stampeded by wolf pack. After the flocks are scattered

in the hills, wolves pick these one by one. Many sheep and goats are lost in one attack. As horses and yaks stay in distant pastures, unattended, free to wander and graze, the horses and male yaks become easy prey to snow leopards. The Changpas make indigenous traps to catch the predators. If the livestock of the Changpas are attacked by wild animals, they do not get any compensation for that. The facility of compensation in case of livestock death is only for Samad people and has not extended to Korzok and Kharnak communities till now.

The herds are also subjected to irregular losses by the extreme cold; mainly heavy frosts at the time of lambing. The sheep and goats resistance to extreme temperature, whether cold or hot is less. The herds suffer a lot, if they exist in a place throughout the year. The migratory cycle is thus necessary to maintain the health of the animals, apart from their requirements for pastures. Besides grazing, each animal has to be provided with one kilogram of salt every year, indispensable for the health of the animals. According to the Changpas, though severe cold is bad for the animals, but harsher the climate, the better the wool is, as animals' fight the cold by growing an extra layer of fibres underneath the top coat.

Severe winters and heavy snowfall cause heavy mortality in January- February. The relatively warm climate of April and May and optimum fodder in the pastures and the farms bring about minimum mortality. With a view to minimise mortality rates in Ladakh, Lahaul and Spiti, offspring birth is managed in such a way so that the birth takes place during April and May to ensure a higher survival rate. This is controlled either through isolation of sexes or through the covering of male genitalia during winters.

On an individual household basis, increasing herd size during good years provides necessary insurance. Big herds can survive a large proportionate reduction with enough animals to recover quickly in subsequent good years due to rapid reproductive rates of sheep and goats. Changpas do not approve of limiting individual herd size.

Besides management and mobility considerations, the Changpas also mobilise their social structure to enlarge their possibilities to cope with disasters. They form mutual aid groups (*deb-she*), which operate at times when groups bigger than households are needed. The main economic advantage of this reciprocal system is that it enhances the capacity of household to wind up bigger tasks.

In many other parts of the world, the pastoral groups increasingly follow non-pastoral income strategies to manage risks caused by climatic fluctuation and animal disease. Economic diversification among pastoralists includes many forms of trading occupation e. g selling milk, wool, animals or other pastoral products; wage employed, both local and outside including working as hired herder, migrant labourer; retail shop activities; and gathering and selling of wild products. The poor herders, who lose major part of livestock due to abnormal weather conditions, often look for other sources of income. While better-off herders who remain in the sector, try to diversify their resource base to complement and sustain their livelihood. It ranks behind the normal means of coping with risks, which include mobility, herd accumulation, animal diversification, the use of social networks and exchanges and trading. Apart from normal strategies of coping with risk, they tried to supplement rather than replace livestock based incomes. Traditionally, the Changpas never pursued any non-pastoral strategies to recover from livestock losses induced by extreme weather conditions and disease spread. The need to earn supplemental revenues has resulted in some households emigrating while others remained in the range areas with the herds.

Insecurity is one of the major concerns of the Changpas, though the nature of insecurity has changed in the past few years. In addition to the Changpas' main causes of insecurity, the severity of future winters and the health of humans and livestock, some new factors have also emerged. Exposure to outside world is one, wherein the Changpas youth look for better quality of town life for their children with education, access to government jobs and health facilities instead of a tough and stressful life. Allied with this is the decreasing control the Changpas have over their lives, and the increasing power of people in faraway offices to make decisions that affect them. The changing social norms, especially those relating to marriage and inheritance are also giving rise to insecurity.

In the Changpa economy, wool is the most important animal product. Recently, a change in the livestock composition has been observed. The number of *pashmina* goats has increased due to direct benefits derived from the sale of the wool whereas number of the yaks has decreased (Rawat and Adhikari 2002, Unpublished report). The distribution of these assets is remarkably equitable. Moreover, caste, class and history do not determine the status of the Changpas. They see wealth as something that they

can easily make with hard work and luck. Many Changpa families have moved from poor to rich within a few years of hard work. On the contrary, laziness has been the downfall of many households. Bad luck is also a factor, a miscalculated winter can deplete one's herd in one year, and an attack by wolf pack can render a 200-herd household into a household of 30 overnight. They see wealth and lack of it as a temporary phenomenon like their cyclic profession and do not link with social development status or human happiness. An infant in wealthy or poor household has equal chances of survival. Children in rich or poor households face analogous problems in availing education facilities. All Changpa women, rich or poor households lead similar life – as they all have to work hard alike and perform similar type of economic activities.

### SOCIAL ORGANISATION

Rupshu has the highest livestock population, with an average 300 animals per family but a low population density to look after them. To control such a large number of animals, the Changpas prefer to live in polyandrous joint families. The social structure, social organisation and community life of the Changpas manages the needs of its individuals and social groups. Flexibility is required to manage herd movement information sharing, risk pooling, aggregation, and dispersal of herders across the region. Formal institutions are necessary to control ownership and transfer of property as well as adjudicate conflicts.

Among the Changpas, the encampment is a level of social organisation, which is an administrative and jural unit. Power and authority is diffused among members. The different aspects of social organisation and social control of the Changpas of Rupshu-Kharnak are the *rebo* (household), *gyut* (lineage) and *pha-spun* (clan). The Changpas are bundled into units that are multi-purpose, but adjusted to meet different scales of uncertainty. Thus the *gyut* deals with local problems, the *pha-spun* deals with larger problems, *sancho*-the camp head deals with problems in larger area and the *goba* deals with larger problems and with regional issues. At the time of crisis in the lives of the people, *gyut* and *pha-spun* members, which are a strong institution of reciprocal mutual assistance, extend help. Based on economic activities, the Changpas have functional groups like herding units, groups of household migrating together and *yato* (friendship groups). An administrative organisation con-



stituting the *goba* (headman), members and *gaspas* (elders) look after the interests of the Changpa nomads. The Changpas maintain relations with sedentary societies and Indian administration. The *goba* and his team helps them in these matters apart from resolving disputes, organising grazing pattern and other community problems. These four aspects of social organisation and social control- the *rebo*, the household unit, *gyut* and *pha-spun* support network and the role of *goba* play an important role in the social and economic life of the Changpas of Korzok, Samad and Kharnak. The *goba* uses his power to organise larger enterprises like communal feasts, festivals, sports and for animal grazing of *gompa*. The Changpas lack structural units to look after environmental assets.

The scattered and constantly shifting herding units of the Changpas and their camp sites correspond to hamlets among sedentary people. The members of a herding unit make up a socially bounded group. The consent of the members of the herding unit regarding such decision is important for the maintenance of a herding unit as a social unit. Community awareness cannot be created by repeatedly arriving at consensus; there should be some hidden principles of kinship whereby the unity of group is maintained. Among the Changpas, the herding unit consists normally (though not necessarily) of an extended family. Next to the *rebo*, each family sets up large stones around which they tie up their yak calves or to which women fix their back strap looms. Every household also possesses *chor-khang* (an enclosure) to pen sheep and goats during the night. In camps, where there are no water-mills, the Changpas carry their own *loksar* (grinding wheel).

The eldest son of the Changpa household, obtain rights at the birth in the pastures and campsite. In campsites, where tent sites are not predetermined, the sites are allocated through the throw of dice by the *goba* who roll one dice for three tents of a patrilineal extended family. The group that gets the highest number has the first choice for pitching a tent. During winter and spring, there is shortage of water and to reduce pressure on the resources the camp breaks up into smaller groups. There is no restriction on the number of animals a household can keep. The Changpas pitch their tents besides the *les* or *chor-khang* meant for livestock. The pens have separate enclosure for lambs and kids. They tie newborn lambs at the center-*repul* of the pen. There is separate enclosure- *yarsdang* for *brimo* and her calf. These pens provide

protection to livestock and serve as main source of fuel.

Although the Changpas of Changthang are Buddhists, yet their real worship is that of local spirits. People and animals live between the gods and the spirits, in a world, which is also inhabited by demons. Among the Changpas, there are three levels at which gods enter the community life — through household worship, *pha-spun* worship and *inter-pha-spun* worship. The Changpas worldview is that relation between animals and humans is based on link or association, rather than a clear boundary between them. Animals are an essential component of seasonal and life-cycle rituals, like the ceremonies associated with birth and marriage. Among the Changpas, animals are a vital link between man and the gods. For the reason that sheep and goats are of subsistence importance, they are icon of worship. They use animals as a means of establishing communication with the divine world. They constantly turn to God and perform rituals to prevent divine punishment and for protection against disasters. Accordingly, each family selects different coloured five male sheep in their flock representing the three worlds and dedicated to supernaturals. They use animals as a means of establishing communication with the divine world. In addition, each family keeps some animals from each type of either gender for the welfare of the family members. These animals elevate suffering of the family and take away sin or evil. All these selected animals get preferred treatment. The economic, social and cultural spheres are interrelated and form part of one reality. It regulates relationships among people and between people and the divine world. Buddhism among the Changpas is different from the Buddhism at the lower elevation. In Changthang, lamas can marry, stay with the family, can take part in economic activities and drink alcohol. The slaughtering of animals is routine part of the economic cycle. The slaughtering of animals is an unorthodox adaptation in this environment.

### ECONOMIC DEVELOPMENT

The pastoral production system of the Changpa, with its adaptive strategies, is a highly well-organised response to the insecurity of their arid and unpredictable natural environment. The augmented menace is not related to climatic changes, as often has been stated in the past, but is more a result of events that took place in



last fifty years. The economy was at subsistence level. The incorporation of Ladakh in to national streamline called for designing of developmental interventions in Changthang.

The development in Ladakh was set in motion after 1962 by the government agencies. The emphasis was on communications and introduction of essential services for the people. In the wake of conflict, this area being of strategic importance caught government attention and was exposed to high military activity. Military posts were set up and roads were constructed for easy movement of heavy machinery and troupes. Construction of roads, improvement in the means of transportation and opening up of Ladakh for tourists has contributed to the exposure of these people to outsiders. However, intervening in fragile environments with complex ecological systems is a difficult undertaking. Many pastoral programmes in other areas of the world have not resulted in progress, but rather in destruction of the way of life of the inhabitants. They ended up in having an environment in poorer condition than before (Swift 1977; Helland 1980; Sandford 1983; Swift and Malaiki 1984; Ellis and Swift 1988). To avoid this, it is extremely important that planners understand the traditional livestock management systems. In addition to the government sponsored programmes, institutions and Non Governmental Organisations (NGOs) are also making efforts to improve the quality of life of the Changpas. Leh Nutrition Project (LNP), The Ladakh Ecological Development Group (LEDeG), which came into being in 1983, has been actively involved in awareness generation programmes related to the environment and sustainable development. In Changthang, Ladakh Ecological Development Group's (LEDeG's) focus is on the diversification of production base through introduction of improved seeds, training on vegetable production for self-consumption, with the financial assistance from Group Energies Renewable Environment at Solidarities (GERES). LEDeG has constructed green houses in Changthang over the last few years.

However, all other programmes for development and subsequent changes were largely centered on Leh town and its neighbouring villages. Even after five decades of independence, the planning commission, central, state and district governments have not been able to find the precise development strategies for areas like Changthang, where environment is harsh and population is scarce, scattered and mobile. It is

difficult to maintain education and health services in this cold desert. The government servants whose job is to run school or health centre here are from outside the Changthang. These employees, who are mostly from Kashmir valley or from Leh and surrounding areas are not accustomed to the extreme environment of Changthang are unwilling to stay yearlong. However, even if they agree to stay, there are no arrangements for their fuel, board and lodging for seven months when passes are blocked and they lack communication with outside world. While the Changpa move periodically, there are no migrating arrangements for these employees. The migratory population cannot avail the education and medical facilities as was seen in the primary school in Samad that is open when the region is accessible, for about four months in a year. At this time, the Samad Changpas are nowhere near the school. Samad School is useful to only settled Changpas. Likewise, the Khar-nak has had a supposedly functional middle school for the last 25 years but has not produced a single student who has completed eight years of education. Solar heated residential schools in Changthang are in progress since 2001-2002. This has solved many problems of nomadic Changpas. The Government High School solves many problems faced by people in remote villages who wants that their children to complete their schooling.

#### **New Sources of Income**

The Changpas who cease to pursue their traditional occupation either become wage earners or find government jobs like peons, teaching in school and military. They have opened small shops to supplement their incomes. Many of them are out-migrating to look for other avenues of earning. The high altitudes destinations of Tso Moriri, Tso-Kar and Pangong lakes in the Rupshu region in the Changthang are attracting many tourists, trekkers as well as on the four wheels. These locations are usually visited by organised three-four days tours by tour operators from Leh and from outside. Tour operators take care of en-route arrangements and provide food and lodging. They have accompanying staff of cooks, helpers and cleaners. Korzok gumpa controls the area. Lamas detest tourists camping close to the TsoMoriri Lake. The only camping area available is one that lies inside a nallah on the other side of the village. Lamas charge

one hundred rupee per tent. Tourism has brought local people in contact with outsiders. Tourism is a prominent sector of earning money. However, until now the Changpas are not part of it in a big way as outsiders manipulate every thing. They have started making private boarding and lodging arrangements for trekkers and tourists who come privately on motorbikes etc.

### **'Pushes and Pulls' - Out-Migration and Sedentarisation**

The Changpas have always been mobile, but another type of migration, which is taking place in the region, is different from the traditional one. The Changpas are migrating from place of their origin and settling near Leh. Causes and consequences of out-migration among the Changpa show that the traditional adaptive system is under stress. The three communities of the The Changpas residing in Changthang were raising sizable herds of yaks, sheep and goats until 1962. The Changpas did not face the pressure of land-loss due to agricultural advancement, nor did they face the many other pressures to modernise. However, there was chain of adverse conditions, which put pressure on the the Changpas' social and their nomadic pastoral way of life. The key factors are harsh winter periods with temperatures reaching -40 degrees Celsius. Limited food results in high levels of malnutrition and micronutrient deficiency. During the harsh winters, children do not attend school, as there are no heating arrangements in school. There are no shelters for animals; medical help is not available to human as well as animal population. Many perish under heavy snow. It is not that the Changpas have not been confronting such conditions from centuries but previously they had no other alternative. Both animals and humans are highly adapted to the ecological peculiarities of the region. The crises nomads are facing in this region have been mainly the result of external factors. Like the Ariaal of Kenya, the Changpas are facing what Fratkin refers to as 'pushes and pulls' on their continued viability as pastoralists. Both environmental and political factors in Changthang have contributed to emigration of the Changpas.

The hope of better life and education for their children and medical facilities for elders are all pulling them out. Socio-political changes in the last 50-60 years are pushing the Changpas to emigrate. These socio-political changes began with the independence of India, followed by other events in the sub-continent. Independence of India followed by Indo-Pakistan wars of 1948, 1965, 1971 and 1999 (in 1999, Kargil- the other city of Ladakh was the scene of fighting); Chinese aggression of 1962, which led to closure of borders and broke 700 years old parental links with the gompas of Ladakh and Tibet; building of roads and highways and massive military build up; loss of winter pasture and salt trade; and influx of Tibetan refugees\* after Lahasa uprising in 1965; State government notification to constitute Changthang as Wildlife Sanctuary along with other two regions of Ladakh\*\* and introduction of tourism brought changes in the traditional setup of the Changpas. With the addition of livestock of Tibetan Refugees and the shrinking of winter pasture at Skagjung, the pressure on the existing grazing land increased resulting in change in grazing pattern and reduction in animal numbers.

The size of the herd has reduced in all the three communities because of loss of pasture. Larger herds on the large pasture could help in recovering losses of livestock during heavy winters. Pasture has shrunk in another way also. Changpas used to go on trading journeys to Tibet, Himachal Pradesh and Zaskar with animals laden with goods. Since the 1960s the nomads stopped going for barter trade. As a result, these animals lost access to the grazing lands all along the way. The family has changed from polyandrous to nuclear. The nuclear family cannot provide the required labour force to manage large herds. The Changpas of Korzok and Samad started going to TsoMoriri and Tso-Kar basins respectively for their winter grazing. As these pastures are not as well endowed as Skagjung, the Changpas had to reduce the number of animals\*\*\* and increase their frequency of moving from four- five to eight to ten times in a year, which meant more work and hard labour.

\* 22 families of TRs were added to the grazing unit of Samad; 28 families to Lower Sumdo grazing unit; 8-9 families to Kharnak and 35 families to Karzok grazing unit. At present, the refugees share the pastures with the local nomads, but mostly live in separate campsites or settlements.

\*\* The state government has already identified a 4,000 square kilometer tract of sanctuary. The area includes the TsoMoriri wetland, Chushul Marshes, Pangong Tso wetland, Tso-Kar wetland, Hanle marshes and Lamo-Skagjung pastures. brought changes in the traditional set up of the Changpas.

\*\*\* Traditionally, the Changpas had large herds of 1000 sheep and goat, 80-90 yaks and 10-15 horses and the poor Changpas had a flock of 200 sheep and goats and three-four yaks.

With the increase in demand of raw *pashmina* from Rupshu-Kharnak in Changthang, there was a rise in its price. The raw *pashmina*, which was sold at Rs. 15 per Kg. in 1962, increased to Rs. 300 per kg. by 1970. This brought an increase in number of *pashmina* goats. The Leh Sheep Husbandry Department data shows that the number of goats has gone up from 184,824 in 2005-2006 to 208,878 in 2007-2008, whereas number of sheep has gone down from 76,443 in 2005-06 to 60,721 in 2007-08. Government departments also encouraged this, as this was a source of revenue.

The increase in the economic value of goats has involved a corresponding rise in their status. Among the Changpas, yak used to have the highest status of any livestock, but with their decreasing number, yaks' position is being slowly usurped by sheep and goats, more particularly the goats. The *pashmina* remains the cash crop of the Changpas. It is true that the Changpas are benefitting from the increased number of goats, but at the same time, the goats tend to destroy the pasture after they have grazed for a certain length of time.

The creation of protected areas posed new threats to the very existence of the Changpas and their livestock. Wildlife conservation, Protected Areas and the livelihoods and development needs of the Changpas are contrary. The Changpas have always known and felt that their lives will always be governed by harsh climatic factors and variability in the climate, but they see the Government policy of declaring their land as protected area as a fundamental threat to their livelihood and pastoral way of life. In Changthang, for centuries, the Changpas, co-existed in relative harmony with their livestock and wildlife across the whole countryside, grazing their livestock on the thin-top soiled grasslands. The Changpas' Buddhist beliefs, herding practices and a relatively low population density have contributed to such a scenario. The administration's decision has threatened the Changpas subsistence pattern. The Changpa nomads residing in the area are apprehensive about the changes that will affect their lives and livelihood. Many of the tents of the Changpas are near the lake, but if the area is out of bounds for taking their animals to pasture, it will threaten their traditional subsistence pattern.

Construction of roads and influx of Tibetan refugees and their animal population resulting in severe erosion of some pastures is having negative impact on the Tibetan argali and Tibet-

an gazelle. Increasing tourism is disconcerting the ecosystem of high altitude lakes due to garbage dumping and vehicular traffic. The Changpas, accuse the thriving tourism and military activities near the line of actual control of harming the fragile ecology of the region. The biodiversity of Changthang rangeland is facing threats from tourism, the army and paramilitary activities.

A joint report submitted by Ethnographic and Visual Archive and Leh Nutrition Project states that over the last 20 years, 24 families have left Rupshu permanently (1993:6). The composition of family ranges from a couple or family group of 12 invigorated. It has been reported that during 1992 and 1993, three families consisting of 38 people moved out. In Kharnak, about the 50% Changpas have moved to Choglomsar, 10 kilometres from Leh, in a locality called Kharnakling.

Migration is a multifaceted progression, rooted in the Changpa responses to three decades of rapid change. In Changthang, the migration is not 'forced' or the results of conscious direct government policies, but are the outcome of socio-political and natural ecological disasters. The Changpas who have migrated to an unfamiliar habitat, try to cope with clinging to the familiar and changing no more than is necessary. This they achieve either by transfer of old skills to the new habitat, or relocating with kin, neighbours and co-ethnics to be surrounded by familiar institutes and symbols. The Changpa who decided to migrate, go to Kharnakling, the colony of the Changpas near Leh. Many of them work at construction sites in the nearby Leh town. Some of them work as guides and porters with the tour operators as they excel in carrying weights and are adapted to high altitude atmosphere. Few of the Changpas converted animals into a more stable form of wealth, such as land. The Changpas' out-migration does not show any characteristic pattern and differs from agricultural seasonal migrant labour of plains. It was observed among tribals of Rajasthan that agricultural migrant labour circulated through various villages and different employers and most migrants moved and worked as family units (Bhasin 2005). Among the Changpas, labour resources are critical to the well-being of the household, as the workload is constant rather than the peak and slack season of the agriculture production.

In the early stages of emigration, either the very rich or the very poor Changpas migrated. There is a third category of the Changpas who migrate seasonally to escape the cold or for getting medical treatment etc. In such cases, whole families do not migrate but only a few family members do. Based on the household data from three communities, between 1962 and 2001, 306 people left Korzok, Samad and Kharnak and settled in Leh town and its surrounding areas. Though, it is a small number but it represents one-fourth of the original community (Goodall 2004). Despite the fact that all the three communities are subject to analogous living conditions, their response and level of out-migration is different. The community level factors play an important role in arresting the out-migration. Out of the three communities, maximum numbers of households have left from Kharnak community, where 20 main and 10 subsidiary ones out of the 70 households have emigrated.

#### **SAMAD**

In Samad, approximately 25 to 30 households have migrated to a housing colony, Kharnakling on the outskirts of Leh, where they are working as skilled or unskilled labourers or in army, government jobs or small business. Apart from Leh town, the Changpas have migrated to Shey, Thikse, Matho and Stok. In Samad, emigration started thirty years back when the government provided some poor families with land and other subsidies. They sold their livestock and other belongings and left. They earned living by labour, educated their children, and successfully adjusted to new way of life in Leh. In 1993, another group of families sold their livestock and other household things and left for Leh. They started their business in trade and transport. From Samad, the Changpas who decided to look for new avenues were either rich or very poor. As a community, Samad Changpas did not take it kindly and decided that once a family decides to leave the area and does not fulfill its duties towards the community and does not pay its dues, it will not be allowed to come back and join the social network of the Samad. Changpas, who are not sure of future success, do not break their social relations and continue to fulfill their community obligations and pay taxes and keep the option of returning open. They make arrangements with their neighbours or relatives,

who would take care of their livestock and social obligations in their absence for payment. This type of arrangement does not hurt the community of origin and benefits both. Though, pressure of social and religious activities increase on the village community but is compensated by the less competition for shrinking pastures. The village community did not allow them to keep livestock for others more than two years due to restrictions regarding taxes and traditional village duties. It is reported by Hagalia that these rules changed in 2003 and it is not allowed to keep animals for absentees (2004). The Government wanting to discourage emigration and overcrowding at Kharnakling, instituted a programme of grant to remain in Samad. This programme still operates, wherein the Samad Changpas receive financial compensation for loss of livestock due to heavy snowfall or predation. The Government was ready to help the Samad Changpas who wanted to return to their place of origin with incentives to buy sheep and goats and other subsidies. However, the village community at the place of origin did not agree to it and the Government dropped the proposal. Even the Ladakh Buddhist Association could not help them. The Samad Changpas have emigrated for education, work or retirement. In cases, where retired parents are staying in Kharnakling, the young parents leave their children for studies with the grandparents and live pastoral life themselves. In a few cases, younger ones come for work and old parents look after the livestock. Individual household members engage in multiple activities either sequentially or simultaneously. Pastoral nomads' households require labour round the year and do not have surplus labour to utilise the extra pastures. Moreover, labour deficit does not allow Changpas to engage in circular migration strategies and earn more money. Only few households with large herds and large labour force have managed to employ this strategy effectively spreading their production base between the two areas. If such wealthy pastoral households are short of labour they can afford to hire labour which poor households are not capable of. In Changthang, such cases are few, in general the out-migration is an adaptation to reduce the overall level of risk and uncertainty in the household economy. From the Changthang, mainly poor households with few resources have shifted as a last resort. Settling down is not a smooth affair, as these people



were not skilled for any other work than the pastoral work. They faced many difficulties in settling there that too with the help from the family members or relative who stayed back in the Changthang. Remittances are often cited as a benefit of out-migration for sending community (De-Haan 1997). Return remittances are usually slow in the initial period of settling. Food, clothing and other pastoral products are exchanged in both directions. As mostly the household shift as a unit, the overall return remittances are insignificant. They had to adapt to the sedentary mode of subsistence and work as labourers or porters. The Changpas have shown extremes in continuation of adaptation from fulltime nomadic pastoralism to full time wage-employment. The Changpas think that salaried employments are good because of regular income and food security. The Changpas have positive attitude towards education. Investment in education among the Changpas is a viable means of acquiring salaried employment, long-distance trade and shop ownership.

### **KHARNAK**

In the case of Kharnak, over the last twenty years, large numbers of families have moved from Changthang. From Kharnak, about 80% nomadic pastoralists have emigrated to Leh, in Kharnakling colony. This locality has become a meeting place for visitors from Samad, Korzok and Kharnak. The Changpas of Kharnak moved out of their place of origin because of heavy snowfall. As already mentioned, traditionally they were managing their livestock by utilising the winter pastures of Samad area, which in turn were going to Skagjung winter pasture. After the Indo-China war of 1962, the Samad Changpas claimed their traditional winter pasture creating difficulties for the Changpas of Kharnak. They face great difficulties during winter. Winter camps in Kharnak are most inaccessible of any of the pastoral communities. In addition, the local topography is said to have increased their vulnerability to heavy snowfall, as the steep valleys receive only a short period of sunlight each day, limiting the rate of snowmelt. There were many reasons which forced the Kharnak Changpas to emigrate. Lack of schools, medical aid, missing transport in case of emergencies to the capital Leh and hard winters are reasons for out-migration. The migration from Kharnak,

which started in 1980 was slow in the beginning but intensified after the area was opened to tourists. A military road passes a few kilometers away from Kharnak's summer encampments. The road has helped in the integration of the urban population with the Changpas and has radically transformed their thought progression. The trip to Leh, which was rare in the past, has become a common place. Any one can visit Leh in summer, in just a hundred rupees. Over the last few years, the migration rate has been four families in a bad year and less than four in a good year. Bad years and good years are marked by the loss of animals due to early snow and cold wave conditions. Such calamities are not new to the Changpas but in the past, there were no alternatives. As other choices are available to them, they can avail other opportunities to earn their living. The Kharnak Changpas have opted for security at the cost of abandoning their traditional way of life. The Changpas are clear about the hardships they are going to face at the place of migration. However, even that does not lessen their zeal for the migration. The spending of one more winter in Changthang without school or medical aid did not appeal and thought of better way of life near schools and medical centre was more welcome. Today, 25 families still live in Kharnak (approx. 110 people) as nomads in a community. Ten years ago there were 80-90 families. More than two thirds of the families (200 people) have already left for Kharnakling, near Ladakh.

Once the nomads make up their mind of migrating to Leh, they start selling their herds and tents. It so happens, as many people are migrating, they do not get good rates. With the money earned, they buy land and build house, as house building is a prerequisite for any migration, seasonal or permanent. As the Changpas are not skilled for any job, they opt for wage labour at construction sites. Even that is not easy to get, as there is stiff competition from labourers of Nepal and Bihar and the Changpas get low remuneration. Many of them work as guides and porters. For that too they have to learn English or any other foreign language. Some of them learn driving and drive trucks for nearby military camps. Few of them buy second hand diesel jeeps and cars and drive it as taxis. They have to struggle hard to earn their living. Driving tourists in and around Leh has become competitive. The Changpas are at a disadvantage as they

enter this business without local contacts and without knowing foreign language. However, they know their terrain well and can transport food and goods around the area in their trucks. A number of, though they own vehicles, they do not drive themselves. They hire someone to drive and act as navigators or guides themselves. The Changpa women work in eating joints in and around Leh. Where both husband and wife are working outside the house, the grandparents take care of the children. The Changpas who drive over mountain roads work with a degree of independence; this enables them to retain a part of their traditional way of life. Instead of being pasroral nomads, they become vehicular nomads.

In Kharnak, when people emigrated, they sold their livestock, tents and household belongings and settled permanently at the place of destination. They broke all their social institutional networks. Breaking up of social ties and social institutions creates problems at the place of origin. The breaking up of a household creates problems in management of large herds. With small children and sick and old parents, it is difficult to carry out economic activities. The head of the household has to perform all the duties. He has to take animals for herding, fetching water and fuel and has to perform his social duties being a member of the community. All *rebos* have to take the *bri* (female yak) and calves of the community for grazing in rotation. In 2002, in Kharnak, the remaining Changpas had to hire a shepherd to graze their animals, for which he was paid in cash besides food and lodging. With the decrease in the number of community members, the pressure of social and religious activities has increased on the remaining village community. The Changpas of Kharnak, who have left the nomadic way of life, felt this and discussed the ongoing departure of families' from Kharnak to Leh. Their special concern was related to the Kharnak Changpas' religious commitment to travel regularly to the little gumpa in Dat to offer prayers to one of the most important gods. This long journey is undertaken on rotating basis by the Changpas of Kharnak, every other day, year round. With the decrease in the number of families in the Kharnak, it has become difficult for these people. The fear of missing to pray at Dat gumpa and the resultant wrath of god is more acute than ever. Smutylo (2008) has narrated the incidence of a lama who was sched-

uled to go and pray at Dat, did not go. A short time later, the lama's young son died while sitting on a yak without any apparent cause of death. It was considered the wrath of god and punishment for not fulfilling his religious duty. The Kharnak Changpas, even if they move out of the place of origin, have to fulfill their duty of praying at Dat in turns. Blaikie (2001) pointed out the difficulties of the community members due to the departure of the village *rgyu-pa* (lineage) *amchi* and two other trained *amchis*. The Changpas of Kharnak were dependent on the *amchis* for their health care, as there was no good alternative to his services and medicines. There are two aspects of dependency: a material aspect and a psychological-cultural one. The material aspect is linked to the prevailing health-care facilities in Kharnak. Traditionally, the lineage *amchi* had a monopoly on medicine giving, and therefore dependency on him was total. However, the *amchi* do not charge for his consultation and treatment but relies on the villagers for their help in pastoral activities and for supply of grains. The *amchi's* way of earning living is increasingly difficult to sustain in a fast changing economy. Nowadays, the opening of a health centre has broken this monopoly. Even after the introduction of biomedicine in the region, there was still a certain amount of dependency on the *amchi*, because of the poor quality of health centre's services. The Changpas of Kharnak have been left without the services of a traditional medical practitioner and have to depend on periodic (poor) bio-medical health care system. The mobile way of life of the Changpas of Kharnak makes it difficult to visit the health centre. The *amchi* was migrating with these people or visiting their encampments on horseback. The psychological-cultural aspect refers to the socio-cultural factors of dependency. The *amchis* are an integral part of the community in which they practice. Their role in society has been shaped and defined historically, and religiously legitimised. The *amchi* operated with locally meaningful and accepted concepts of health and sickness. Lack of an *amchi* has affected the Kharnak Changpas deeply on a number of levels, from the absence of medical treatment to the loss of an important social institution, and cultural reference. On the verge of extinction are not only a highly advanced medical system but also a community-based curative and preventive practice, emphasising water and

spring cleanliness, proper diet and healthy living. The *amchi* are not medical practitioners but also serve as consultants and advisors in the village affairs. In Kharnak, many Changpa families or individuals move between the place of origin and place of destination, depending on the circumstances. However, in contrast to Samad community, the Kharnak community does not object to returning of a fellow villager if somebody wants to do it.

### **KORZOK**

As compared to these two communities, the rate of emigration to Leh is low from Korzok. Demographic analysis of migrant population in Leh town shows, however, that a representative cross-section of the community has settled here. In the absence of demographic data for the origin communities, Chaudhuri (1999) used secondary population data for Samad to compare age and sex structure between origin and destination. It was found that there is slight over-representation of females and an under-representation of young people in the migrant population. This is because; the young population between the ages of 10 to 18 constitute the major working force in the household work and are too old to begin schooling. If young couples move out of the Changthang, the elders left behind have nobody to look after them and fewer youngsters to pass on the craft of weaving. This is in contrast to rural to urban 'migration in Oceania, South Asia and Africa, where young male adult population dominate the migrant population (Oberai and Singh 1983; Skeldon 1990; Pathak and Mehta 1995). Even then, there is a relative balance of age and sex in the migrant population indicating that the Changpas migrate as a family unit. Goodall's (2004) finding is in contrast to the common assumption that retirees and young people of school age dominate the migrant population (Dollfus 1999; Bkaikie 2001). Among the Changpas, emigration and sedentarisation corresponds to Salzman's (1980) sedentarisation adaptation and response model. Sedentarisation "is a voluntary, uncoerced pressures, constraints and opportunities both external and internal to the society——. This is not to say that all societal change is generated entirely by the preferences of the actors, for changing constraints and pressures not of their making are consequences of environmental, demographic, and

external political and economic processes (p.14). Sedentarisation is a process of adaptation and response to changing pressures. Both environment and political factors in Changthang have contributed to emigration and sedentarisation. Post Indo-China war of 1962, the Indian government's aim was to develop the Ladakh region. Coupled with this was the historically based enmity between China and Tibet, which has led to create a seemingly unsolvable Tibetan Refugee problem. The already tenacious ecological balance maintained between the Changpas and the pastures, after the entrance of the Tibetan Refugees was further exacerbated by the snow and locusts-storms, which are still affecting the Changpas. Goodall in her study on Changpas did not, "identify factors such as resource limitations, population growth, or accessibility and exposure to urban areas as variables of primary explanatory importance" (2004: 225). She found after discussion with migrants and non-migrants that, "the response of households to 'external' pressures, and the decision to stay, leave or engage in part time pastoralism, mediated through diverse, community-specific factors such as institutional arrangements, normative forces, economic incentives, and psychosocial motivations"( *ibid*). A process occurs-whether originating in external pressure, inter spontaneous adaptation and response to both—which generated several others. This process is an ideological shift of members of the pastoral nomadic society to individualism. The individuals within the sedentarising pastoral nomadic society gradually disentangle themselves from the bonds that commit them to the traditional social organisation. They become highly motivated by their contemporary, more personal complex, and varied value system. This cultural change does not necessarily entail sweeping change. Rather, they follow a selective approach and in part stick to traditional mode of life.

Like elsewhere, the Changpa sedentarisation has been encouraged by international development agencies and national government to alleviate problem of food insecurity, health care delivery and national integration. In Changthang, majority of pastoralist households remained committed to nomadic livestock production system. Livestock raising and barter trading is becoming less popular because the educated population is not interested in carrying on these economic activities. While the trans-Himalayan

societies have demonstrated significant amount of lethargy and inertia towards new ideas in the past, but the history of this area is characterised by the gradual acceptance of modernity and change. The initial success of the governmental policy of road construction improved the scope of employment in these areas. This success resulted in positive feedback loop. The frequent governmental interventions in the area were supported and mediated by important local functionaries like *goba*, *Members*, *Lamas* and *amchi* etc.

### DISCUSSION

The Changpas' subsistence level pastoral economy, traditional social and religio-cultural systems are composite part of cold desert's ecological system. Their way of life shows a capacity to adapt themselves to rugged cold desert environment. The Changpas possess a high degree of specialised knowledge and a flexible social organisation to make viable the mobile mode of production. Despite the ecological constraints, the Changpas were managing their environment for making a living without outside intervention. Their own societal controls like polyandry and cutting of excess animals, helped in turn by their customary rights and equity in resource allocation has helped them. The Changpas are organised using a patrilineal idiom, all members being patrilineal descendants of the founding ancestor. Rangeland, livestock, manpower and the considerable knowledge of the skills necessary to exploit them effectively are the principle economic resources of the Changpas of Changthang. Resource management in a risky environment illustrates the skills of the Changpas for survival. Traditional practices of Changpas, such as the rotation of grazing areas and use of reserve pastures in case of natural calamities help manage the variability of ecosystem and bail out pastures from state of permanent degradation. Each animal has its own specific characteristics and adaptation to the environment. Rearing together different animals maximised the use of vegetation in the pasture. Different animals graze on different plants.

Over recent decades, the Changpas of Changthang have been experiencing changes due to external pressures that have altered political, economic and social landscapes. Traditionally, the Changpas were self-sufficient and livestock were providing them with their food and

lodging. In recent decades, continuous massive defense investments and improvement in communications; proliferation of government departments; introduction of development plans; provision for basic amenities, alterations in traditional subsistence economy, its commercialisation and extension of know-how through government departments and non-government organisations and tourism has led to a higher motivation among local people for better standards of living. Increasing administrative and market integration and population growth over the years have weakened socio-homeostasis with no functional substitutes for restoring positive social system.

Changthang no longer a 'Restricted Area' is attracting many tourists. Although tourism employs only 4% of the Ladakhis (still less the Changpa nomads) working population, it now accounts for 50% of the region's GNP. In order to ensure sustainable tourism in protected area like Changthang, it is essential to improve infrastructural facilities associated with institutional capacity. Increased pressure on grazing lands on par with the exponential rise in the number of trekkers and pack animals is of particular concern as the harsh climatic conditions of the region hamper the prospects of pasture regeneration. Tourism activities have adverse impact on the environment as well as local population, both directly or indirectly. The local Changpas have not benefited much from the tourism as Leh based travel agents organise and operate these tours.

There are no schemes for tourism development. Tourism is revenue and employment oriented activity. This may also help boosting handicraft sector. Ecotourism has potential to provide economic development as well as sourcing of funding for the maintenance of environmental conservation. The increasing interaction with tourists as well as urban people led to higher motivation among the local people for better life.

In many parts of the world, the pastoral nomads are under pressure of marginalisation and modernisation, as their land is being used for agriculture. Though, the Changpa pastoral nomads are not prone to the same pressures as the land of Changthang has no potential for agriculture. However, the chain of adverse conditions like abnormal weather conditions and shortage of winter pasture are forcing the Changpas to abandon their nomadic lives, their traditions and total loss of their identity and culture. Traditionally, under such con-



ditions, they survived on the food collected during summer and completely depended on *tsampa*, lentils, rice, milk, butter and dry cheese. This resulted in high levels of malnutrition and micronutrient deficiency. During the harsh winters, children do not attend school, as there are no heating arrangements. Pastoral adaptations face a myriad of challenges, of which climate change is one. Climate change is emerging as a real threat to the Changpa society. The capacity to adapt to climate change is strongly linked to the capacity to respond to shocks and long-term transformation of any type.

Research shows that pastoral livelihoods are far from static. According to Keenan (2006) nomadic pastoralism is a mode of subsistence and not a mode of production. Like Marx (2006), Keenan argues that, “nomadic pastoralism, by its very nature is transitory” (p.684). Endogenous and exogenous influences affect economic and social factors that may change pastoral production over time. The quality of abnormal weather management systems is thus one indicator of how well pastoralists are equipped to manage shocks. The Changpas suffered heavy livestock losses in 1981 and consequently some Changpas out-migrated to area Kharnakling near Leh town. Last three four years have shown that the Changpas who have been surviving for hundreds of years and enduring all types of weather conditions, have been finding hard to bear abnormal weather conditions of last few years. In February 2008, some 150,000 *pashmina* goats were facing death because of heavy snow in Changthang. The goats pasture spread over rangelands of Changthang area, had been covered by unusually deep snow and there was shortage of fodder. It was the highest snowfall in decades (two feet snow). Traditionally, Changpas reserve some pastures for severe winter use. For the last three-four consecutive years, desert locusts’ swarms had attacked this area. According to Ladakh Autonomous Hill Development Council, Leh, because of snow in February 2008 the pastoral groups shifted to spring pasture in January-February, two months in advance of scheduled time. Desert locusts’ swarms had consumed almost entire lower pastures. Locusts destroyed the summer pastures, which were lying abandoned. The Changpas have their traditional strategies to deal with severe cold. The Changpas following a snow disaster, shift as many young animals as possible to other areas and make reciprocal arrangements with neighbouring communities to

care for their animals. The government agencies help the Changpa nomads rebuild their livestock herds and sustain them by distributing food and clothing. Regardless of government and local efforts, many households lose animals and could use assistance in restocking their herds after snow disasters. Subsidising local system with inputs from outside can lead to increased vulnerability and ultimate to system collapse, because the inputs leading to structural changes of the system move it into a new system. Scientific opinion might be divided whether these are signs of a climate crisis; but these people have their own understanding of such ecological changes. They cannot fathom what ‘global warming’ means; what they do know is that it means change in their livelihood, way of life, in the way they have understood nature for centuries. Food security and health is already high on their worry list.

Communications with tourists augmented local aspirations for improved standards of living as well. The introduction of money in to the economy facilitated local people sustained these changed in their lifestyle. The Changpas felt a sense of relative denial and looked for other avenues of income. The Changpas obtained a great number of necessities of life by exchange. Cash played a minimum role in the Changpas’ lives and household economies. The each Changpa household had stable relations with number of trading partners in sedentary villages in the surrounding regions. The Changpas of Korzok were bartering wool for barley from the villagers of Spiti. In the recent years, the villagers in Spiti started growing green peas in place of barley. Green peas fetch more money. In the meantime, Changthang region was changing too. The government started supplying food grains through Public Distribution System(PDS). When Changpas started receiving grains at their doorstep, they felt no need to travel long distances with animals laden with wool and salt.

Changpas rationally make use of their resources, and are perceptive and practical pastoralists. They are open to change when they perceive new options to be appropriate to their way of life and cultural value. Though the landscape remains punctuated by the traditional black tents -*rebo* and livestock, it is also marked by new white canvas tents. The Changpas have bought vehicles and have started using trucks during migrations for carrying household goods. Likewise, the educated Changpas are not interested in traditional way

of life; they prefer to get government jobs. Education has given them choices. Before they had access to education, they had options of traditional occupations like animal husbandry, trading and crafts. However, education has opened new fields for the Changpas.

Through the inheritance laws of primogeniture and polyandry, the Changpas were able to contain their population and manage their nomadic way of life, where many working hands were required. Polyandry was one of the arrangements frequently followed among many pastoral and agro-pastoral transhumant societies; it was not a compulsory social script. In Himachal Pradesh, the agro-pastoralist of Kinnaur opted for polyandrous family with a jointly organised system of production. In contrast, the agro-pastoral transhumant Gaddis of Bharmour, Himachal Pradesh, on the other hand, prefer partition in to smaller nuclear families, even though they work collectively (Bhasin 1989). By the changes brought in the area with the opening of the area for tourism, introduction of education and moving out of the area, the young Changpas are opting out of polyandrous system of marriage. With the increase in number of nuclear families, the population of Changthang is on rise. Pastoral's nomad system is particularly sensitive to population growth, because the environment here has no potential and technical possibility for raising productivity and tends to be more resource degrading. For natural resource management, the Changpas have to maintain an ecologic balance between pastures, livestock and people. It is an adaptive strategy to demanding environment. As their access to pastureland become more limited and available winter pasture is increasingly degraded, pastoralists are forced to buy fodder for their animals.

With the recent changes in the region, the traditional Changpa society practicing an overpoweringly barter economy with socially fixed economic exchanges has transformed to an economic system characterised by monetised trade and specialised exchanges. Need for cash has increased among the Changpas as they have to buy grains from PDS shops, fodder from government agencies at 898 rupees per quintal, pay for schooling of children, clothes, tents, equipments and shoes, health care, medicines and veterinary care. *Pashmina*, which was a traditional barter product has become like a cash crop and is sold for cash. For centuries, pastoralists in Changthang have lived in the context of environmental uncertainty and

have developed a diverse range of strategies, institutions and network to minimise this unpredictability and risk. Pastoral management strategies, which may have worked previously, may or may not be sufficient now. The three communities of Samad, Korzok and Kharnak responded differently to these changes. Various pressures with an ever-increasing rate of change necessitated the adoption of new strategies for survival.

As a result, of above-mentioned factors, Changpas have to look for new strategies in addition to traditional strategies of mobility and herd diversification to meet their both ends. By reducing herd size and increasing the number of goats in a herd and wage earning are strategies to cope with population growth, and conservation policies and shrinking winter pasture. Income diversification is an important means for herders to manage risk. In order to maintain household viability individual members may migrate to seek employment elsewhere in order to relieve their pastoral household of a member and to earn money to contribute to overall household income. If the household losses are too great, entire households are compelled to migrate, leaving few animals with the relatives. There is difference between strategies of poor pastoralists who have lost major part of their herd, often look for other sources of income and those better off who remain in the sector but are diversifying to complement and sustain their resources. The type of sedentarisation, which has occurred among the Changpas, is structurally connected to the ecology of the pastoral nomadism. Desertion of the nomadic way of life can be the consequences of a momentous fall in productivity, but it can also imply the opposite, that the profit was higher than average in the productive system. In both the cases it results in the sedentarisation and discontinuity of pastoral nomadism.

This study focuses on adaptations of the Changpas of Changthang and their traditional subsistence techniques to its particular environment, together with the far-reaching socio-economic alterations imposed on this traditional system by external factors. The livelihoods of the Changpas have always been dependent on the natural resources and sensitive to climate change. However, such events can be easily separated from the major issues like pasture degradation and policy changes. The Changpas

have always known and felt that their lives are affected by harsh climate and variability in the climate in the past also. However, they see the government policy of declaring their land as protected area, (in addition to other socio-political factors of stationing of army, shrinkage of winter pasture, addition of Tibetan Refugees to their area and opening of area to the tourists) as a fundamental threat to their pastoral way of life. Adaptation is a necessary strategy at all scales to compliment changes. According to Burton et al., (1993), the term adaptation covers eight categories: bearing losses (doing nothing), sharing losses, modifying the threat and thus preventing effects, changing use, changing location, assessing new research based technologies, disseminating knowledge through education to behaviour and restoration. Others have classified adaptation as anticipatory and reactive adaptation, private and public adaptation and autonomous and planned adaptation (IPCC 2001).

Traditionally, the Changpas were bearing losses under abnormal weather conditions. As they have no structural arrangements in their social system for sharing losses, they managed by keeping large herds to compensate for the losses. They could not modify the threat of climate variability and thus could not prevent effects. As the land had no potential for any other use, they had to depend on pastoral nomadism for their livelihood. It was neither possible for the Changpas to assess new research based technologies nor propagate knowledge through education to behaviour and restoration. Educationally, The Changpa nomads are backward. From the point of view of official education, they are far behind in terms of enrolment, attendance, continuity to higher education and gender balance. Lack of schools, gender stereotypes and gender bias among the Changpas are major barriers that hinder girl's and women's access to education. The only alternative left with the Changpas was of changing location. They are adapting by shifting from nomadic to settled life and from livestock herding to wage labour in Leh town. This implies that the Changpa's response to the environmental and socio-economic changes has resulted in their shift from mobile mode of production to sedentary adaptation. This dynamic process has helped them in reducing the diverse effects of climate change on their health and well-being, and also the attraction of new opportunities in marketing and wage

labour. This adaptation means many anticipatory adjustments in case of adverse consequences associated with the change of place. It has been observed among the Changpas that this type of adaptation can be spontaneous or planned or can be carried out in response to or in anticipation of change in the conditions. The Changpas' division into nomadic and sedentary elements does not correspond to social groups formed on such ideological basis as *pha-spun*, but is rather a distinction based on work, division of labour stemming from fluid productive conditions at the place of origin and place of destination. These productive conditions, in turn are effected by unstable ecological factors. In the beginning, there was a constant coming and going between place of origin and place of destination.

Such out-migrations from pastoral areas start a chain migration with a lack of labour force in many households leading to further losses. In such situations, the richer households take advantage. On the one hand, they are secure in their economic settings and on the other hand, the households who move out of the region temporarily or permanently, leave their animals with the remaining herders. Similarly, the remaining herders have more pastures at their hands and can increase their flock. This is giving rise to socio-economic differentiation causing stratification in a small society. Large households with more manpower and livestock resources become powerful while smaller households becomes more vulnerable because of less manpower and resources. With fewer resources, they cannot take risk or diversify their economic activities.

Samad, Kharnak and Korzok are transition villages in terms of progressiveness, adaptive ness and educational levels. The extent of modernisation in Changthang is far behind that of Leh town. With the change in political circumstances and government policies of providing the economic opportunities, there is change in the region. The Changpas response to change shows the ability of traditional pastoralists to assess the carrying capacity of pasture and water at their disposal and maintain rational grazing that avoids environment deterioration. The Changpas have adapted to these changes in two ways:-some have become sedentary and have changed their occupations; while others are still following the mobile mode of subsistence. The different Changpa households responded differently. Among Changpas, very rich

and very poor looked for income diversification. Income options vary by proximity to the nearest town and by gender and the wealth category of herders. The wealthy herders and poor herders have different diversification options. The relatively wealthy households went for diversification, for which it was a strategy of accumulation or investment. While for the poor households, diversification is a matter of survival. The wealthy Changpa herders invested in land and in transportation, while poor Changpa herders are working as labourers at construction sites or with tour operators to act as porters. These jobs are extremely laborious and generate little income.

A study in Hanley valley, in an analogous area of Changthang has shown that the Changpas of Hanley have responded differently to the similar conditions. Traditionally, livestock production was the major land use in the area, as high altitude and aridity did not allow agriculture production. Nevertheless, in early 1970's, some nomads started cultivating green peas and barley. This improved with time and assistance from government and non-government agencies. Agriculture Department, Leh has enabled cultivation of grains and forage. Presently almost 70% of Changpas in Hanley valley cultivate food. They have opened shops etc., they are settling down near areas with a good water source and are building concrete houses. They are using motor vehicles for transportation. They are switching over to alternate sources of income that need less manpower, which is in contrast to the situation in Rupshu-Kharnak, where people are moving to the urban centre-Leh.

Likewise, the Bhutias of Lachen and Lachung in North Sikkim, who suffered heavily at the time of Chinese aggression in 1962, responded differently. The Bhutias animatedly adjusted themselves to changed socio-political environment. Their own social and livelihood pattern played an important in making alternative ways of earning money a viable way of life. Their traditional economy was marginal agriculture and pastoralism associated with trade. High up on northern borders, marginal agriculture and animal husbandry was not sufficient to sustain population, so the Bhutias indulged in trading activities with the Tibetans across the border. The Bhutias of Lachen and Lachung pursued it as an occupation intimately interwoven with their pastoral activities. Thus, as long as trade was unhampered by political restrictions, it enabled them to

remain economically independent. After the closure of border, there was a difference between the strategies of the Lachenpas and Lachungpas, one reduced its number of small flocks and carried on with yak herds only and played more attention to agriculture and tourism while the other maintained both agriculture and pastoralism (Bhasin 1996, 2012).

Rural urbanisation in developing countries is often thought of as a phenomenon caused by high birth rates in rural areas, and due to that people have to migrate to look for better opportunities of earning money. These stereotypes are not correct for Changthang and do not tally with standard assumptions. More than two-thirds of the original families of Kharnak have already left and moved near Leh, the capital of Ladakh. Thomas and Martina Zwahlen, through talks with the Changpas of Kharnak came to know the main reasons for giving up their mobile way of life on the high plateau. It turned out to be the lack of school, shortage of water and absence of transport in case of emergencies to the capital, which is 150 kilometres away. Apart from schooling, which is the main reason, the other reasons for out-migration are hard winters and Leh offers an apparently easy life. If parents decide to educate their children, it is compulsory to send them to a boarding school in Leh at the age of four or five. They cannot come during their winter vacations, as the passes remain close. The children are hardly in their place of origin and loose touch with their culture and way of life. Not only is separation from their families a dilemma, the children also loose ability to live at the place of their origin. The permanent household migration and settlement in other regions was the result of the number of the changes that have taken place in the place of their origin. The social and economic effects of migrations on migrants themselves as well as the communities they leave behind are of equal importance. In the pastoral households, labour is needed throughout the year for the mobile mode of production. In households where there is surplus labour, few members can afford to go to avail other opportunities of earning surplus money. In a way they are able to spread their production base between their home place and place of migration. However, some households opt for out migration to reduce the over-all level of risk and uncertainty for their families. On the contrary, it becomes demanding for households, who do not have surplus members.

Already substantial number of the Changpas from three communities have emigrated and



adapted a sedentary way of life. The processes of sedentarisation of pastoral nomads cannot be fully explained on the basis of hard economic facts alone as was stated by Spooner, “nomads whose flock is reduced so low— that he cannot live from it may drift to nearby areas as a day wage labourer, or — a nomad whose flock grows beyond a size that can not herd himself may sell the excess animals and invest the process in land. Having invested in fixed property he becomes interested in its welfare and so becomes attracted to avail a settled life” (1973 b: 10).

In order to provide better governance, the administrators should have a better understanding of these formal and informal strategies in light of increasing climatic variability, growing competition for pastures, rising population and development. The policy of the developers should be, rather than treating diversification always as an alternative to pastoralism, it should be seen as a mechanism for adding economic value in pastoral communities and regions and for helping to maintain pastoral livelihoods. To encourage herders to pursue education based diversification, school locations and calendars should reflect the seasonal nature of pastoralism and population movements. Mobile schools should be given more serious consideration, so Changpas who want to educate their children can do this without leaving their pastoral livelihoods. They should not have to make a choice between the pursuit of pastoralism and sending children to boarding schools.

The planners are facing a challenge to establish a sustainable and efficient level of operations for the maintenance of natural resources and to ensure food security in the area. The authorities have to deal with problems of the depleted animals and vegetal genetic resources and increasing poverty in Changthang. However, there is no clear policy with legal, institutional and planning frameworks for sustainable development in Changthang. Development concerns in the Changthang revolve around managing the local resources in such a way as to conserve and enhance the biodiversity of the area and to promote socio-economic development. Linkages between ecological and socio-economic approaches insure that development is location specific. Centre for Sustainable Development and Food Security in Ladakh, a NGO is working towards an enhancement of the living standards of the the Changpa nomads. Food and nutrition security is important

at the level of each individual for productive life; body security in turns depends upon the security of livelihoods. Environmental security is the base on which both food and livelihood safety rests. Thus, conservation and development of the natural resources becomes necessary components of a sustainable food and livelihood safekeeping and eradication of poverty. To counter this emigration, government has proposed that Changpas should settle at one place and build permanent homes. Two places, Thugje and Tasa Phug have been suggested that have permanent water source through out the year.

The local conditions in Changthang keep on changing, consequently development and conservation decisions must be based on micro-level data. However, available data from Changthang is too little to understand about the eco-system for informed decisions to be made about intervening to alter basic components of their traditional system. It is essential; therefore, that systematic research on the current ecological status of the Changthang rangelands as well as on the effectiveness of the nomads’ traditional adaptations is assessed and no drastic measures should be taken in the name of science and progress. The serious environmental problems and their solutions must be ascertained area by area.

The programmes are not area specific. Even though the Division has its own geographical and demographic characteristics, the programmes are almost identical for all the border blocks. The area specific needs either are neglected or are not fully taken care of. The programmes are formulated without any clarity of concepts and methods leading to serious problems in implementation. The way things are going, it may lead to the possible demise of nomadic way of life in this border area. To sustain mobility and the Changpas way of life, a multi-pronged strategy is required to deal with problems of this border area with fragile environment; poor infrastructure and to look into grievances of the people.

### CONCLUDING REMARKS

The Buddhist Changpas-pastoral nomads of Changthang, Ladakh form an ethnic entity. Like other nomads in the world, the pastoral nomads of Changthang are a minority, suffering problems of under representation, social, economic and geographic marginalisation (Kratfi 2001). The region is

extremely poor in conventional energy sources (fossils, fuel and wood) and has almost no industrially exploitable resources. Natural environmental limitations dictate many aspects of traditional life, especially settlement pattern and economic system. Among the Changpas, the pastoral mode of livelihood is an evident attempt to adapt to a natural environment, which provides no plants as food that can support humans and has no potential for growing food crops. Under such conditions, the only solution is to domesticate large herds of various animals, which can feed off the plants and in return, the animals can sustain humans.

Over recent decades, the Changpas of Changthang have been experiencing changes due to external pressures that have altered political, economic and social landscapes. For centuries, pastoralists in Changthang have lived in the context of environmental uncertainty and have developed a diverse range of strategies, institutions and network to minimise this unpredictability and risk. Pastoral management strategies, which may have worked previously, may or may not be sufficient now. The three communities of Samad, Korzok and Kharnak responded differently to these changes. Various pressures with an ever-increasing rate of change necessitated the adoption of new strategies for survival.

Changthang no longer a 'Restricted Area' is attracting many tourists. Tourism activities have adverse impact on the environment as well as local population, both directly or indirectly. The local Changpas have not benefited much from the tourism as Leh based travel agents organise and operate these tours. There are no schemes for tourism development. Tourism is revenue and employment oriented activity. This may also help boosting handicraft sector. Ecotourism has potential to provide economic development as well as sourcing of funding for the maintenance of environmental conservation. The increasing interaction with tourists as well as urban people led to higher motivation among the local people for better life.

Changthang's unique landscape, rich biodiversity and high number of endemic species, makes it a special area for conservation. Scarce resources, the lack of alternatives and traditional practice of clear-cut division of all usable areas and pastures between the communities make resettlement of the Changpas outside Protected areas a difficult proposition.

In many parts of the world, the pastoral nomads are under pressure of marginalisation and modernisation, as their land is being used for agriculture. Though, the Changpa pastoral nomads are not prone to the same pressures as the land of Changthang has no potential for agriculture. However, the chain of adverse conditions like abnormal weather conditions and shortage of winter are forcing the Changpas to abandon their nomadic lives, their traditions and total loss of their identity and culture. Climate change is emerging as a real threat to the Changpa society. The capacity to adapt to climate change is strongly linked to the capacity to respond to shocks and long-term transformation of any type.

Communications with tourists augmented local aspirations for improved standards of living as well. The introduction of money in to the economy facilitated local people sustained these changes in their lifestyle.

Changpas rationally make use of their resources, and are perceptive and practical pastoralists. Likewise, educated Changpas are not interested in traditional way of life; they prefer to get government jobs. Education has given them choices. Before they had access to education, they had options of traditional occupations like animal husbandry, trading and crafts. However, education has opened new fields for the Changpas.

Through the inheritance laws of primogeniture and polyandry, the Changpas were able to contain their population and manage their nomadic way of life, where many working hands were required. With the increase in number of nuclear families, the population of Changthang is on rise.

With the recent changes in the region, the traditional Changpa society practicing an overpoweringly barter economy with socially fixed economic exchanges has transformed to an economic system characterised by monetised trade and specialised exchanges.

As a result, of above-mentioned factors, Changpas have to look for new strategies in addition to traditional strategies of mobility and herd diversification to meet their both ends.

The study focuses on adaptations of the Changpas of Changthang and their traditional subsistence techniques to its particular environment, together with the far-reaching socio-economic alterations imposed on this traditional system by external factors.

Traditionally, the Changpas were bearing losses under abnormal weather conditions. As

they have no structural arrangements in their social system for sharing losses, they managed by keeping large herds to compensate for the losses. They are adapting by shifting from nomadic to settled life and from livestock herding to wage labour in Leh town. This implies that the Changpa's response to the environmental and socio-economic changes has resulted in their shift from mobile mode of production to sedentary adaptation. This dynamic process has helped them in reducing the diverse effects of climate change on their health and well-being, and also the attraction of new opportunities in marketing and wage labour. The Changpas' division into nomadic and sedentary elements does not correspond to social groups formed on such ideological basis as *pha-spun*, but is rather a distinction based on work, division of labour stemming from fluid productive conditions at the place of origin and place of destination.

Samad, Kharnak and Korzok are transition villages in terms of progressiveness, adaptiveness and educational levels. The extent of modernisation in Changthang is far behind that of Leh town. With the change in political circumstances and government policies of providing the economic opportunities, there is change in the region.

The Changpas have always been mobile, but this migration is a complex process, embedded in the Changpa responses to three-four decades of rapid change. Causes and consequences of out-migration among the Changpa shows that the traditional adaptive system is under stress and strain.

The policy of the developers should be, rather than treating diversification always as an alternative to pastoralism, it should be seen as a mechanism for adding economic value in pastoral communities and regions and for helping to maintain pastoral livelihoods. To encourage herders to pursue education based diversification, school locations and calendars should reflect the seasonal nature of pastoralism and population movements. Mobile schools should be given more serious consideration, so Changpas who want to educate their children can do this without leaving their pastoral livelihoods. They should not have to make a choice between the pursuit of pastoralism and sending children to boarding schools.

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Build up of a larger population of Indian army and the influx of foreign tourists, along with the development policies of government (subsidies and ration shops) have all contributed to encouraging a monetary economy. Ladakhis are experiencing an economy for the first time wherein technological advances and economic gains are the driving forces. A materialistic culture of notion of having a job and buying what one needs is replacing the idea of self-producing and self-sufficiency. Four wars, the closure of border, the considerable presence of Indian Army and slow commercialisation of economy have played an important role in the socio-economic life of the people.

## NOTES

1. This was a part of an investigation 'Ecology, Human Settlements and health in the Cold Desert Ladakh' during my tenure as a Research Scientist in the period 1989-1994. This research culminated in the publication of two books entitled- 'Transhumants of Himalayas: 3Health' (1999).
2. From each herd, five male sheep with specified colour combination are dedicated to different gods.
3. The Changpas keep few sheep for expelling curses and bad luck. These are not dedicated to any particular god. In case of evil eye or curse, the Changpas offer incense and recite prayers over

- such a sheep to ensure the breaking of spell. They do not sacrifice these sheep but keep them simply for worship.
4. This is compulsory and reinforced by the camp head who fines families who do not abide by this. The *rebos* in which birth or death has taken place are exempted from this rule.

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