



Livelihood, Sustainability and Change among Changpas of Changthang: Ladakh India

Veena Bhasin*

Department of Anthropology, University of Delhi, Delhi 110 007, India

KEYWORDS Nomadic Societies. Buddhist. Pastoralist. Transhumant. *Pashmina* Production. Cold Desert's Ecological System

ABSTRACT Pastoral societies use animals as providers of food, fuel, fiber, draught power and transportation. However, nomadic, semi-nomadic and transhumant pastoralist societies have lifestyles that revolve mainly around their livestock. The transhumant pastoral societies inhabiting the high Himalayan areas exploit the seasonal abundance of grazing areas. As social and ecological conditions change, pastoralists adjust accordingly. Contrary to their reputation, pastoralists have traditional practices for conserving vegetation by rotational grazing. Pastoralists make a significant contribution to India's economy in terms of food security (milk), provision of draft animal power, as well as foreign exchange earnings (meat, fiber for example, *pashmina* wool). Since pastoralists do not own land, their produce is generated by dependence on communally and state owned grazing land. Currently, the trend towards globalization of the market, with pastoral lands increasingly being commercialised and/or turned in to national parks, has created problems for the pastoralists. Since Independence of India, the pastoralists of the Himalayas have faced a series of significant changes from external, political and economic changes. These structural alterations have brought adjustments in many aspects of the traditional pastoral system, including migratory cycle, local economy and social organisation. Many of them left their traditional transhumant way of life and settled along valleys. Some have settled in urban areas, others stick to the pastoral activities by changing the composition of livestock by increasing number of goats and decreasing number of yaks. All pastoral groups in Himalaya face the similar constraints and stimuli. Natural exigencies, extreme weather conditions, drought, epidemics and predators, result in reduction of animals. Likewise, social crisis, such as phases in domestic developmental cycle and work force shortage in herding groups cause concern in the community. An attempt has been made to study the change and problems faced by the area- Changthang and people- Changpas due to the development programs of the government agencies of the state.

INTRODUCTION

Nomadic societies have revived strong and renewed interest among anthropologist. These societies are scattered over the world and seem to be mutually comparable. Since Independence of India, pastoral societies have been affected by external political sectors. These structural alternatives have brought adjustment in many aspects of their production system.

This study is based on information gathered from the field areas of Changthang, Ladakh, in 1990, inhabited by Changpas. The Changthang plateau, spread across Ladakh and Tibet at an altitude of 5,000 metres, is home to the bulk of the world's *pashmina* production. 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- 'Transhu-

mants of Himalayas: Changpas of Ladakh, Gaddis of Himachal Pradesh and Bhutias of Sikkim' (1996); 'Tribals of Ladakh: Ecology, Human Settlements and Health' (1999). After 12 years, the researcher had the opportunity to revisit the area with the World Wide Fund for Nature-India (WWF). This area has evolved and has witnessed several changes. After the visit, another book, entitled, "A Desert in the Sky: Life on an Edge among the Changpas of Changthang" (2012) and a paper in Journal of Biodiversity (2012) was published.

In 1990, Changthang area was in the 'Restricted Areas Zone' and that was only accessible to citizens of India after getting prior permission from Deputy Commissioner's Office in Leh, the district capital. Inner Line Permits (ILPS) were mandatory for non-state residents who wanted to visit Changthang. In 1994 this ban was lifted and the area was opened to tourists.

The Buddhist Changpas-pastoral nomads of Changthang, Ladakh form an ethnic entity. Like other nomads in the world, the pastoral nomads

*Retired Professor

of Changthang are a minority, suffering problems of under representation, social, economic and geographic marginalisation (Kratli 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. These animals provide the Changpas with meat, milk, varieties of wool, which they use themselves and barter for grains and other utilities.

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 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 Khar-nak, responded differently to these changes. Various pressures with an ever-increasing rate of change necessitated the adoption of new strategies for survival.

Overview

These areas of Ladakh visited by some scholars, remained largely unmapped and unexplored because of their strategic position. As already reported that at the time of fieldwork, it was difficult to gather information in these areas for political and security reasons. Hence, the data regarding the place of migration was collected through interviews, observation and scattered information with the help of interpreters. It required special permission from police, wildlife authorities and the army to access the protected slopes in Changthang. Earliest account of Changpas come from the Mughal general Mirza Haider Doughtat (1499/1500-1551) who raided Ladakh and conquered Kashmir in the 1540s. He mentioned that the inhabitants of great Tibet area divided in two section-*Yulpa*- the village dwellers and the other 'Chamgpas' inhabiting

desert. He also described some of their strange practices. Seventeenth century onwards some missionaries British officers and travellers, who travelled through Ladakh, mentioned Changpas in their memoirs.

Early western travellers prove poor sources on the transhumant tribes of Ladakh; but at least the Changpa names and a little description of Changthang is specified. Cunningham (1853) mentioned that sheep population was 250 thousand. Drew (1871), a geologist visited the area and described black hair cloth-tent dwellers. They are owners of sheep, goats and yaks (Cunningham 1853; Moorcroft and Trebeck 1837; Drew 1875). In 1896, Kharnek area was visited by Henry Zouch Darrah, an Indian Civil Servant. He visited the area Charaku Summer for hunt game of wild ass, agrali and black sheep and he described in 1898, the way of milking of animals among these people (Francke 1907; Heber and Heber 1923). Isabella Bishop (1831-1904) was a 19th century English traveler, painter and writer. At the time of her tour, there were five hundred Changpas, who made four moves in a year, dividing in summer, and uniting in a valley, free from snow in the winter. Giotto Dainelli (1932) followed her. Prince Peter of Greece and Denmark, an anthropologist on the third Danish expedition to Central Asia travelled through Rupshu in 1938 and later on published his work (1955, 1963). In the last two decades, the Changthang area has been the centre of research. Anthropologists, biologists, conservationists and health professionals are carrying out studies (Jina 1995; Bhasin 1996, 1999; Rizvi 1999; Chaudhuri 1999; Ahmed 2002; Goodall 2004; Rawat and Adhikari 2005; Rosing 2006). Ahmed (2002, 2004) has studied the tradition of weaving among the nomadic pastoralists of Rupshu, a small community of 346 Rupshupa in 1993 in eastern Ladakh for whom weaving is their way of life. They believe that gods bestowed the craft of weaving on them. According to her, weaving touches all aspects of life in Rupshu. This study documents analyses the ways in which fibers, weaving and textiles are symbolised, constructed and experienced in Rupshu. This experience as she shows is different for men and women. Women weave on blackstrap loom and men on fixed handle ones. The Rupshu textiles are not merely functional. Their colour, form and function, the fibres they are made from, and the designs they are embellished with, speak about life in Rupshu-

upa. She focused on the transformations in the *pashmina* trade after 1959, and examined how in recent years this trade has changed the fortunes of the nomadic pastoralists of eastern Ladakh. Changes in the *pashmina* trade have meant an increase in the economic value of goats. This has led to shifts in composition, as well as attitudes towards the goats.

The focus of Rosing's (2006) study is traditional healing and shamans of Changthang. Traditional pastoralism has been exposed to a number of externally driven factors that have had major impacts on the use of natural resources in Changthang. Recent studies deal with the effects of Sino-Indian war of 1962 on these nomadic communities. Over the past four decades, many nomadic Changpas of Rupshu-Kharnak have settled in and around Leh. Current studies of people of Changthang suggests considerable social, economic and land tenure changes, particularly after the war between India and China. Various studies, contracted in the area, point out a loss of productivity from the pastoral areas associated with significant out-migration. This relates to the supply of animal products to the urban population, but more importantly, to the valuable export commodity of *pashmina*, which is the raw fibre produced by the goats in Rupshu-Kharnak. Goodall's (2004) study deals with rural to urban migration and urbanisation among the three nomadic pastoral communities. The Changpas have migrated to Leh town, in the housing colony adjacent to Leh, in the Khar-nakling settlement, and in the villages of Shey, Thiksey, Matho and Stok. The evidence from the three nomadic pastoral groups reveals some of the complexities within the process of urbanisation. The study uses the theoretical literature on human migration to examine the sedentrisation process that has gained momentum in the latter decades of twentieth century. Many pastoral societies are facing an unprecedented rate of change, as they are increasingly blending with national economies.

An understanding of pastoral nomads of Changthang is important for a number of reasons. The pastoral nomadism in this fragile environment is resultant way of life to exploit environment without depleting the resources or contributing to environmental degradation. It would help to understand this ability to maintain sustainable production in this cold desert, in the light of changes taking place in and around

Ladakh. It is of great value, than to acquire the base line data, before programmes of economic development are imposed on these people.

CHANGTHANG

Changthang sub-division with an area of 21,000 square kilometers, occupies a strategic position, sharing border with both China and Pakistan. The cold desert-like landscape and vast plains of Changthang share the area and climate with the adjoining region of Tibet. Changthang is a vast cold desert/steppe landscape that forms part of the Hindu Kush Himalayas, where a mix of pastoralism and agropastoralism sustains the economy. It has an extremely short 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 climate is severe and extremely 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 (Kitchloo 1977). 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 (1990). 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 approximately 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 the north and east by China. Indian Air Force and the 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 inhabiting: Samad, Korzok and Kharnak, who use a large rangeland - Rupshu- Kharnak. The three groups use neighbouring grazing land, with boundaries that divides them from each other. 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

Topographical features of Changthang 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). 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 disinte-

grated 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 (*Conis lupus chanku*). Snow leopard (*Uncia uncia*), a flagship species is most significant.

Wetlands

South Changthang has several wetlands, lakes and streams, including three big ones- Tso-

Moriri, Pangong-Tso, Tso-Kar, extended marshes and seasonal rivers carrying melting water during early summer. Lakes, ponds and marshes form a significant water-reservoir network.

Tso-Moriri

Tso-Moriri, a fresh to brackish water lake of about 12,000 ha. area at 4594 meters, is located 215 kilometres south east of Leh. With annual precipitation of 10 mm and temperature ranges of 0-30°C in summer, -10° to -40° C in winter, the upper surface of lake remains frozen in winters. The lake is fed by a number of small glacial streams, notably one from the north, which enters the lake at Pelde Le. Another stream, Phirsa flows into lake from the north-west. The lake is considered a relic of ice age, formed by melting waters of ice-masses left behind by retreating glaciers. It has no external drainage. Due to a high rate of evaporation, it is almost bereft of living organisms. Although it is a closed system, it once had an outlet from the south to the Sutlej River. Therefore, the quality of the water varies, from fresh to brackish, depending on the fresh water discharge of the three streams that feed it (Gujja et al. 2003). This wetland ecosystem provides feeding and breeding areas for birds, including the highly endangered black necked crane (*Grus nigricollis*) and bar headed goose (*Anser indicus*). Migratory birds, especially bar headed geese, start arriving in early May on a single island (80 metres long) in the Tso-Moriri.

On the north-western shore of the lake stands the Korzok village of the Changpas. The government rest-house at the edge of the lake, fresh constructions, tourists camps and setting up of an Indo-Tibetan Border Police (ITBP) post comprising around 50 men.

The area around the lake is home to kyang (the wild horse of the Changthang), wild goats, marmots, and gigantic "bearded" vultures. The wetlands provide rich pastures for domestic livestock. The Lake is owned by the Government of Jammu and Kashmir and part of the proposed Changthang Sanctuary.

Tso-Kar

Tso-Kar is located about 50 km north-west of Tso-Moriri. It is of about 20km² area and very irregular in shape. The typical cold and arctic

conditions prevail here with temperature-30°C. Tso-Kar basin at 4530 m altitude includes the sweet-water Statsapuk-Tso and the salt water Tso-Kar with their respective marshes and meadows. The Tso-Kar was apparently a large lake during interglacial times and has now been reduced into two basins-freshwater Statsapuk Tso and hyper saline Tso-Kar (Drew 1875). Three-fourth of the vast area of Tso-Kar is occupied by expanse of sand and salt marshes, which serve as feeding grounds for the visiting cranes. The salt collection from the shore of Tso-Kar commenced after the closure of the Tibetan border. However, the developments of roads have improved the supply of salt by the trucks and the distribution of Tso-Kar salt is reduced to the most isolated valleys of Zanskar.

Pangong Tso

Pangong Tso is a huge brackish lake of about 700km². Though it is a closed lake now, it had an outlet to the Shyok River, a tributary of the Indus from the North West. Two streams flow into the lake from the Indian side, forming marshes and wetlands at the edges. All the three major lakes have a legendary origin.

The location of Tso Moriri, at the confluence of three important trade and now tourists' routes: Spiti in the south, the Tso-Kar basin accessible from the Manali-Leh road in the north-west and the jeepable road leading to Upshi and Leh in the north-east region, is attracting many tourists. At Tso Kar basin their vehicles pass through the streak connecting the two lakes, which unfortunately is the only vehicular road. Even the arrival of Changpas at Tso-Moriri and Hanley marshes corresponds with the arrival of the one of the rare bird species in India, the Black Necked Cranes. Only a small population of 60 cranes visit India each summer and just 25 breed in the wetlands of Changthang.

Fresh water is a scarce commodity, especially during the long winter when the rivulets freeze. Access to water is one of the causal factors, along with access to pasture, for the nomadic way of life of the Changpas and often determines the location of encampment and extent of scatter within the community. Lakes, marshes and streams represent the only sources of humidity within this high altitude barren landscape on which the entire flora and fauna, including human population and their livestock, depend.

The increased activity is likely to affect the breeding waterfowl population. Increasing pollution levels in areas of tourists' concentration like trekking routes and campsites is gradually emerging as problem affecting both people and wildlife. In the absence of garbage disposal facilities, the people are dumping garbage in to the nearby streams.

Rangelands

The 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 and fell fields at high altitude are four distinct physiognomic units of vegetation. 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. 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 ecosystem (ponds, small lakes, rivers, brooks and wet mound covered marshes) offer large diversity of flora within the harsh high altitude environment.

Ecological Adaptations on the Changthang

Human resource exploitation strategies 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 agricul-

ture as practiced by the Changpas of the high plateaus of Rupshu, Kharnak and Karzok region. In Rupshu and Kharnak, the entire population leads, a nomadic life whereas in Karzok about ninety percent population move from one ecological zone to another;

- (2) Transhumance based on goats and sheep rearing with marginal agriculture as practiced by 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 live-stock 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 (ICI-MOD 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 *Lunpas* and sedentary *Rongpas*. 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 *Rongpas* inhabit the villages 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*” (Bhasin 2012).

Lunpa Cultural Area

Lunpas, 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 percent 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 percent families have tents and are engaged in transhumant activities, while rest 60 percent families are engaged in agriculture and trade.

Changpa Nomads (*Drokpa*)

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.

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. 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 Khazanov (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 Changthang sub-division of Ladakh and are associated with other groups through economic exchanges.

Traditionally, the rangeland of Changthang was and is state-owned and individuals 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. As Korzok lay within the Sadod, the Rupshu *goba* managed the area and for Samad, he appointed another person to administer the area who was accountable to him. 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 *gomba*, the Korzok *gomba* acts as a major cohesive force and the nomads meet annually at the Korzok *gomba* for religious ceremonies.

The three Changpa communities of Changthang fall somewhere between the categories of nomads and semi-nomads. Though, the Changpas do not live in permanent structures, they do

have store houses, shelters for the old and retired parents and some minor cultivation. In Samad and Kharnak, the whole community leads transhumant life, while in Korzok, 90 percent are transhumant and ten percent 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 percent of Leh District population. In Korzok, pastoralism, trading and marginal agriculture are the economic pursuits followed by the Changpas. 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.

Korzok, Thugje and Dat are the permanent winter settlements of the Changpas of Korzok, Samad and Kharnak respectively. Thugje (15156 feet) is the main village in Tso-Kar plain (maidan). It has one *gomba*. On the other side of Thugje *gomba* is Nuruchau with the Changpa houses. Their main source of earning is '*pashmina* wool'. However, 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 handle 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 encroach-

ment. The grazing pattern of the three communities consist of fixed spatial movements, that is 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 Kharnak used grazing land of east Rupshu called the Kharnak valley. 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 gompa respectively, in addition to their own livestock. Other Changpa families graze their own livestock. 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. All the three communities have small storehouses near their gompas in their winter villages, where they keep food and equipment not in use currently. For constructing storerooms and shelters, they use locally available construction material like stones and wood. Though, it is a vegetation scarce area, they get tamarisk, willow, poplar and juniper from lower Rong areas. In Rupshu, stone dwellings for the Lamas and the aristocracy have existed for decades. The hereditary chief rulers had houses in the main summer and winter encampments. Permanent structures and cultivation does not challenge their identity as nomads, as their main source of earn-

ing and way life rely on mobile herding. All the Changpas have to carry their things like tents, stove, food, clothes, carpets and other household items between camps and from storehouses to camps, which makes it lots of work. The pastoral production practices are similar across the rangeland although the composition of livestock varies. Almost all nomads have a base, usually in a traditional winter village from where they make well-established moves with their livestock to seasonal pastures. They keep some pastures for emergency and when conditions become difficult, they move to these areas.

Throughout the Changthang region, the traditional way of life is nomadic pastoralism with seasonal mobility. The level of socio-economic development in the Changthang area remained low. With inadequate education facilities, the literacy rate remained low. With poor infrastructure, physiographic and climatic reasons, the opportunity for economic development is restricted. Limited access to information and illiteracy also means that the local herders miss what economic opportunities might be available. The merchants or intermediaries cheat the Changpas because of lack of education.

SETTLEMENTS IN CHANGTHANG

Korzok

The Korzok village 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 some Changpas, Korzok derived its name from two words; *Kor*, which refers to the livestock owned by the gompa, and *zok* where goods are stored. It lies approximately between the north latitude 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.

Most of the land of village Korzok is owned by locals. The livestock of the nomadic Changpas graze the marshes and pastureland around lakes. A small portion on the periphery is used by people of Korzok village for agriculture. The barley fields at Korzok are considered to be high-

est cultivated land in the world. The local Buddhist community considers Tso Moriri 'sacred' and they do not use the water of the lake. At the WWF Annual Conference in 2000 in Nepal, the local community declared Tso Moriri a 'sacred gift for a living planet'. The Changpas never pitch their *rebos* near the shore of any lake. They have their main summer encampment upstream of Korzok village at Korzok Phu. Another lake, Kiagar-Tso lies between Korzok gomba and Puga. Tso-Moriri has been designated as a Ramsar site, and measures are under way to collect relevant information to declare it a World Heritage Site.

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 gomba 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.

Korzok Gomba

Overlooking the Tso Moriri is a 300 years old Korzok gomba, which houses 35 lamas. Unlike other gompas in Ladakh that are generally perched on hilltops, Korzok Gomba is built on a gentle slope. An impressive *photong* is located near to the gomba. A number of *chortens* are also seen near the gomba. The *chortens* above the Korzok village is connected by engraved stones *manay*. Lama's residence is on the lake's shore. The gomba belongs to the Drukpa sect. Lama Kunga Lotos Ningpo founded this gomba in 1851 A.D. The present gomba rests on the ruins of the original structure built before the 17th century. The Changpas helped in its construction. Once a gomba was built at Korzok, it became a focal point of the region of Rupshu and the *goba* its chief authority. The Korzok gomba is like a huge rectangular building with one side higher, home to the temple. The three sides close the interior courtyard to form homes and out buildings of the lamas (kitchen, storage and pantry etc.). These lamas are spiritual teachers and an integral part of the village life. This

gomba has a copper built statue of Shakyamuni, representing the founder saint of the Red-Sect, one of the oldest religious orders of the Tibetan Buddhism. The gomba has images of other deities, beautiful *thangkas*, and restored old paintings. All the Changpas gather once a year to celebrate a festival. At the end of July or early August, the festival of the gomba takes place accompanied by lavish feast. There is a nunnery in Yagang. The Korzok gomba 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 gomba and the money collected is used during festivals. The home of the Rupshu *goba* is located next to Korzok gomba. 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. A few trucks carrying food supply, business goods etc. and jeeps of visiting VIPs were the only ones that use to pass between Tso-Kar and Stsasa Puk-Tso, crossing the narrow stream which joins the two lakes thus leaving a mark on the long, partly dusty and partly marshy track. With the passage of time, every passing vehicle gave it a shape (beaten track) of the only route in the valley. However, the few vehicles that used to pass earlier were no threat to the wildlife. Korzok, previously situated in the valley, afterwards shifted to a new site along the side of the mountain overlooking 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. Karzok is one of the two three places in Rupshu, where there is cultivation. Some 12 acres of land are sown with naked barley (which does not always ripen) and only five acres in Rupshu. In early May, the Tso Moriri, frozen during the winter, begins to thaw and cracks appear in the upper layer. The Changpas of Korzok start collecting brushwood for fuel. In late spring, Changpas with the help of Lamas start agricultural operations on an auspicious day. Their fields are at a lower level on the periphery

of the lake. The whole family accompanies the Lama at the time of the visit to the fields. The man ploughs the field with the help of horses and his wife put barley seeds in the fields. The Lama sits and prays there for the whole time. However, despite all efforts the crop does not ripe. During this time, nomads come to village, but they again have to go to adjoining highland pastures as there are not enough grazing areas near the village. At the height of the spring, the crops need watering. 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 *nalah* 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, Leh Nutrition Project (LNP) conducted a study. It was found that only 40 percent Changpa children were attending school as compared to 69 percent of the settled population (Leh 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 gompa, where they store the surplus things that they do not require when they are on the move. In their annual migration the Changpas make not many moves and the community stays together for much of the year. 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, snow-melt 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 begin 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 Changpas 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 had 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, attract number of tourists. There is one PWD guesthouse 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 gompa 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. Seminomadic 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. The community headquarters is located at Thugje along the northern extent of Tso-Kar. This settlement comprises of a gompa, 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 gompa 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 gompa 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 gompa for its upkeep and send young boys to Korzok gompa 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 renovation, 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 watershed development programme and implemented by the Sheep Husbandry Department in 2002, in addition to a natural spring in the wetland. Samad lacks education 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 into small groups of five to fifteen tents. During winters, they move in clockwise direction around the Tso-Kar basin. Hagalia (2004) states that the Changpas 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, Zirguland 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 gompa animals in rotation. The families, who are in charge of gompa animals, get the best grazing areas. They move to that area with the gompa 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 "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 settlement 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 gompa in Kharnak, which facilitates the celebrations of Dalai Lama on his birthday (6th of July) when a large number of nomads gather here. This gompa 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 gompa 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. 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, Yagang, 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 TsoKar basin, the traditional pastures of Samad Changpas. After the closure of the border, 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 *goba* donated Yarang-a part of Samad 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 Samad 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 21st 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 settlement 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. The introduction of these Tibetans disturbed the existing balance of livestock and pastures, as 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 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 works 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 (300km²; 32° N, 78° E), a remote area that still needs a permit. Hanley valley is an important area for wildlife conservation. There is a 17th 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. 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 *KarGyudpa* 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. The Changpas of Kharnak have no such traditions to narrate. They claim that they have never heard of them.

The Changpas traditional costume is prepared by locally available material. Aspects like freedom of movement, reinforcements of wear areas receptacles for tools, loops and *Sharak* for the support of pouches and equipment, and proper distribution of weight over the body have been taken into account. Another important factor in the Changpa dress is the durability and the availability of material. However, the Changpas do not wear the traditional garments for daily use. They wear sheepskin in winter only, while in summer they wear woollen, corduroy, synthetic fabrics such as polyester. Most men wear a western dress consisting of jeans and t-shirt, while women wear Punjabi outfit – *salwaar-kameez* under the local dress. In 1998, the Ladakh Buddhist Association made it mandatory to wear traditional clothes at religious festivals and public gatherings throughout Ladakh.

Broadly speaking there is no caste system. However, families who have a higher ranking within the community because of their wealth, profession or position are called *Kaga* and the rest as *Tronpa*. *Gara* (ironsmith), *Kange-zen* {who eat kyang (wild horse) flesh} and *Sebde* (whose body emits bad smell) have lower social status. Traditionally, the Changpas and other Ladakhis did not marry. However, when Ladakhi King SingeNamgyal married Kalzang *Dolma*, a girl from the family of Rupshu *Goba*, the inter-marriage with other Ladakhis began. Nowadays, even Tibetan refugees are marrying Changpa girls. In fact, Tibetan refugees are good traders and after marrying local girls, they get maximum profit while dealing in the wool trade. Among the Changpas, the household serves as one of the primary corporate groups of society. People are recognised by household names.

Rangeland, livestock, manpower and the considerable knowledge of the skills necessary to exploit them effectively are the principle economic resources. Like all societies, Changpas 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. Resource management in a risky environment illustrates the skills of the Changpas for survival (For details see Bhasin 2012).

Centre for Sustainable Development and Food Security in Ladakh, a NGO is working towards enhancement of the living standards of the most deprived section of the Ladakhi population—the Changpa nomads.

Economic relations of labour, production and subsistence are arranged in the household. Other corporate groups are *pha-spun* and *bcu-ghogs* (group of ten). Families in a common patriline or common lineage form a kind of group, mostly 4 to 10 in number, that mutually help each other in many activities. Labour is a critical obligation an individual owes to society. Labour exchanges are conceptualised as relations between households. The labour exchange binds together households; each individual involved in a reciprocal labour exchange serves as a part, which stand in for the household.

Traditionally, the Changpas used positive restraints to reduce fertility. Family and marital structure and mode of inheritance maintained population at a low level. For instance, fraternal polyandry wherein brothers married a single woman lived in families where a group of brothers worked under the leadership of the eldest brother who was the prime inheritor. There was only one marriage per generation in one household. Monogamous system with fraternal polyandry limits population while maintaining an effective labour force in the family.

Another population controlling factor was monasticism. Traditionally, a second son born in the family was ordained to monasticism, implying a marked control on reproductive potential. Combined with polyandry, this produced a surplus of unmarried women. There was some input of illegitimate children to the population. But the number of such children was small and these remained with the family of mother's brother. The percentage of monks has decreased in the area. The earlier inheritance pattern and limited job opportunities may have encouraged the monastic institution. Currently, of course, the monastic order has to compete with administrative jobs or jobs offered by the Indian army.

The traditional staple diet of the Changpa is milk and milk products (curds, butter, buttermilk, whey and cheese), meat, and *tsampa* (roasted grounded barley). The Changpa procure food grains in exchange of animals and their products such as milk products, *pashmina*, wool, hides etc. or they earn cash by selling animals or their products in order to buy rice, wheat, sugar, salt and other condiments from Public Distribution System (PDS).

Tsampa is precooked and an ideal form of nourishment for winters and long journeys when fuel is not available. They mix it with salt-butter-tea to form sustaining and tasty dough. The Changpas are very fond of *gur-gur* (salt-butter) tea. This, with dry cheese (*Churpe*) forms the real basis of Changpa food. They add to it a respectable quantity of meat supplied by the dead animals of the herd, beasts killed during hunting and a few yaks and sheep slaughtered on special occasions. The slaughtered animals are cut into quarters, which are hung up to dry; and during the rest of the year, the Changpa eat this raw meat, which they cut into thin shreds. Pork and poultry are unknown to the Changpas. They drink large quantities of *Chhang* (local

beer). While grazing in high pastures, Changpas depend on *thugpa*, prepared from wild green vegetables viz. *Pong-Chad*, *Neba*, *Za-chod* etc. that grows freely up to an altitude of 4500 metres. The Changpas are fond of turnips but they do not relish other vegetables like tomatoes, cucumber and cauliflower. They also take *Yud*-a grounded mixture of *churpe* (dry cheese), dry meat and jaggery. They consume *tsampa* in different ways, either in a powder form or by boiling in water; or as unleavened bread with meat. They obtain tealeaves through trade.

Food habits have undergone drastic changes during the last 25 years. Food items like rice, flour, sugar etc. have entered the Changpas' life through the Public Distribution System (PDS), which has a sales depot in almost all the villages. Availability of fresh fruits and vegetables is low. Food was scarce earlier, but is now available in abundance. However, it is neither nutritious nor balanced. The modern Changpa diet is high in fat and protein, one of the causes of high blood pressure. The high daily intake of salt and butter in *gur-gur* tea is the additional cause of high blood pressure. Protein sources are in plenty due to overconsumption of meat and livestock products. Vitamin deficiency is galore in this region due to the absence of fresh fruits and leafy vegetables. This results in vitamin C deficiencies, causing scurvy, especially in winter.

The relevant literature suggests that seasonal migrations of pastoralists tend to increase the risk of good health. There is an inverse association between spatial mobility and health status among the herders. The Changpas are highly vulnerable since their lifestyle involves perpetual mobility in extreme weather conditions in the remote isolated area. It is true that regular pastoral migrations, population dispersion and low human density have protected the Changpas from epidemics. If spatial distribution has protected them from epidemics, it also creates problem to the effective use of health care system.

DEVELOPMENT PROGRAMMES IN CHANGTHANG

The Changpas with modest physical assets, with limited education and feeble claims to public goods are lagging behind in overall development. Apart from physiographic and techno-ecologic handicaps, the region's low level of literacy hinders socio-economic development. Devel-

opment in the Changthang is allied to the overall development of Ladakh. Ladakh being on the crossroads on an old but significant trade route connecting Tibet, Kashmir, Central Asia and the plains of India and as the source of famous *pashmina*, had an important place in the region. The economic gains of crossroad trade were limited to Leh and few of the surrounding villages. Most Ladakhi villages were self-sufficient and self-sustained agricultural communities. The customers of *pashmina* wool, produced in Changthang were outsiders. The gains from *pashmina* trade for the most part evaded the rest of Ladakh. Between 1947 and 1959, the region saw the demise of the Silk Trade Route and Ladakh became distant and ancient history.

With the Chinese occupation of Tibet in 1959, the influx of Tibetan Refugees into Changthang and Indo-China war in 1962 brought attention to the development of the area. The development in Ladakh was set in motion after 1962 by government agencies. Ladakh shares border with both China and Pakistan, so the emphasis was on communications and introduction of essential services for the people. Consequently, the government's aim was to build roads and improve ways and means of communications to facilitate troop movement and supplies to military bases. In addition, the government introduced other modern facilities like education, health services, power supply, public distribution system, advance technologies and vehicular transport. The government also made available subsidies, grants and loans for the betterment of trade. Flexibility, movement and risk aversion have been the most important strategies of adoption to the changing environment in Changthang. The employment commenced cash economy in other parts of Ladakh and Changthang was no exception. Until this time, the area remained comparatively isolated. The isolation was never absolute in the sense that they were in touch with the people of other areas who came to barter for wool or the Changpas went to their areas. Pastoral households are always part of large-scale economic and social structures. Among the Changpas, such integration has provided the basis for the continued viability of pastoral adaptations. 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. Better connectivity was desired for easy information flow, essential for security measure reasons. However, it was also intended to raise the prospects of integration of local people with other parts of India through improved governance and developmental work.

However, all these programmes for development and subsequent changes were largely centered on Leh town and its neighbouring villages. It is challenging to develop an area like Changthang and its inhabitants, the Changpas, because of harsh and extreme weather conditions with short working season and scarce, scattered and migratory population. The government confronted many problems in maintaining education and health services in this cold desert. 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. In Korzok too, the education facility is availed by *Yulpa*- the settled Changpas. The starting of migratory schools did not work out as the government servants whose job is to run school or health centre here are from outside Changthang. These employees, who are mostly from Kashmir valley or from Leh and surrounding areas are not accustomed to the extreme environment of Changthang and 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 the passes are blocked and they lack communication with the outside world. The Changpas move periodically and there are no migrating arrangements for these employees. Solar-heated residential schools in Changthang are in progress since 2001-2002. This has solved many problems of the nomadic Changpas. The Government High School solves many problems faced by the people in remote villages who want their children to complete their schooling. The government has just completed a new boarding

school for the education of the Changpa children aged between seven to twelve years at Puga. It is situated on the western edge of Changthang, far from the nomadic Changpas. It was supposed to serve all the Changpa groups. The Puga School is about 70 kilometres from the Kharnak encampment at Yagang and even farther from some of the other camps. In this rugged mountain terrain of Changthang, depending upon the time of the year and mode of transport, it takes about one to two days to reach there. It is a boarding school and students have to stay for nine months in a year.

Health facilities suffer the same fate. There is one sub-centre at Karzok, under-staffed and non-operational for most of the year. The nearest medical facilities available year round are at Nyoma and Leh, both of which are far away from Rupshu-Kharnak, a daylong vehicular travel, if the roads are open. The government employed *amchi*, visit these villages on horseback, but that too in summers only. In winters, they too shift to Leh.

The Changpas used to barter wool for barley, their staple food from the neighbouring villages of Spiti. In the recent years, the villages in Spiti have started growing green peas in place of barley as green peas get high price. In the mean time, the Changthang area was also transforming. The government introduced Public Distribution System (PDS) releasing Changpas from the duress of barter exchange. Once PDS was set in motion, there was no need to travel long distances with animals laden with wool and salt for bartering as wheat and rice were available at doorstep. The introduction of PDS of food grains was an important factor of change. This was undertaken to provide rice and wheat at subsidised rates. This led to altering food habits and less reliance on barley, their staple food.

Distinct geo-physical situation and related socio-economic conditions create special problems for the inhabitants. They face hardships because of inadequate and/or lack of basic infrastructural facilities. In view of the difficulties faced by the people, the Border Area Development Programme (BADP) was introduced in 1992-93. The remote villages of Changthang remain inaccessible for six months a year. The temperature can drop to -50 degree Celsius in winter. Conventionally the Changpas live in *rebos* and use kerosene lamps for light, which produces smoke. Now, in many areas the Changpas have

been provided with solar lanterns, which ensures at least three hours of electricity regularly. Families are encouraged to look after and maintain power services by the local solar engineers. To ensure holistic development of people and natural resources in the watershed belt, watershed programmes for treating waste and degraded land has been in progress in 12 villages of Nyoma Block.

Development concerns in the Changthang revolve around managing the local resources in such a way so 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.

The Sumdo and Ankung Changpas have access to hospital in Nyoma and in nearby TRs encampment. The Korzok Changpas who are away in Teygajung for their winter grazing, are able to avail the medical facility at Tibetan Border Force medical center at Chumoor. In Chumoor, they have wireless facility as well, so help can be called in case of emergency. People have not been immunized as health workers have not been provided with vehicles to visit the villages of Korzok and Kharnak.

There are serious delays in the movement of funds in Changthang. Sometimes it so happens that the funds are required during specific months of the season and due to late receipt of the same, purpose of the specific activities is defeated.

The Changpas move from one pasture to another throughout the year. The Government extension workers are located at particular stations. Although it is mandatory on the part of the extension centres to remain mobile with the Changpas, yet it is practically difficult to do so. There is a proposal to train some young Changpas in the use of simple medicine and other aspects of breeding and management of livestock to assure veterinary help throughout the year. The veterinary paramedics shall be provided with veterinary kits and a continuous supply of medicines.

Large areas close to China have been virtually denied their share in the development, and consequent tourist inflow because of security concerns. Sonam Tsering, a councillor of Changthang says people feel let down especially as they know that the Chinese are building a new city and an airport on their side while there

is no mobile connectivity on India's side (The Tribune, On Line Edition, 31st October 2008). At many places, Chinese Television Programmes are clearer than a fuzzy Doordarshan, which remains the only mode of entertainment for impoverished border people.

Under Border Area Development Programme (BADP), the department of handicrafts has provided various improved handloom machines, equipment and tools to the artisans at subsidised costs to enable them to carry out the handloom activities for raising incomes. Under this programme, 258 beneficiaries have been identified for distribution of the above equipment in Nyoma and Durbuk blocks. They have introduced foot-looms among women as part of an income generating scheme. The foot-loom can work faster and weave fabric of broader width. The government has promised to provide foot-looms as well as for arranging markets for their fabric. However, tradition forbids them to operate the loom with foot as weaving and loom are sacred to the women. As looms are pure and connected to gods and ancestors, the women do not want to operate these with feet. For them, it would be a religious error to make fabric on foot-loom. Belief system underlying weaving in the area demonstrates its links to Gods, the ancestors and advent of religion.

Animal production has stagnated in recent decades because herd expansion is closely tied to winter forage. Recurring snow disasters have also decimated herds. For the development of *pashmina* in Ladakh, various projects are going on. International Fund for Agricultural Development (IFAD) is helping the nomadic Changpas. The project is expected to benefit most households of Changthang through membership in marketing and processing co-operatives. The objectives of the projects are for overall development for forage resources, processing technologies and marketing infrastructure. The government instigated various development plans in order to improve the socio-economic conditions of tribals and other weaker sections of society. Officials treat these highly heterogeneous tribal groups, each with distinct ecological, social and economic characteristics, as a homogeneous whole. This has resulted in the funds for development often being allocated without due consideration for the felt needs of individual tribal groups.

The Changpas do not produce grain for harvest and storage for winter use. In the absence of stacked fodder grass during winter, livestock perish in thousands in case of heavy snowfall and abnormal weather conditions. The department has established feed banks in Changthang where more than 3000 quintals of feed/barley is stored every year for supply to breeders during the crisis period in winters. It came to the notice of the officials that Changpas are not able to pay the cost of feed. Consequently, the department had to arrange for subsidy for timely disposal of the feed stored at the feed banks. The department proposes setting up of fodder banks on the lines of feed banks at Kharnak, Samad, Angkung (Sumdo), Korzok, Tegajung, Deque, Karluk, Phobrang and Kargium villages in Changthang.

The new economic opportunities intimidate traditional social and environmental balance. Four wars, the closure of border, the considerable presence of the Indian Army and slow commercialisation of agriculture have played an important role in the socio-economic life of the people. Changes can be seen in the area. Many Changpa tents have stove with two burners. The supply of LPG cylinders is from the main encampment, where cylinders reach by the trucks. From the base encampment, the Changpas bring cylinders on yak or horse back. The lamp powered by the solar panels lights many tents. Gas lamps, ready-made garments, fabrics, health drinks, plastic buckets, bowls, nylon socks, paints, sports goods, cosmetics, soaps, shampoos, packages of noodles and chewing gums are available at shops. China-made things are well-liked among the Changpas. Crocs shoes are very popular with the Changpa children.

'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 Changpas residing in Changthang area raised sizable herds of yaks, sheep and goats until 1962. The

Changpas do not face the pressure of land-loss due to agricultural advancement, nor do they face the many other pressures to modernise. However, there is chain of adverse conditions, which are forcing the Changpas to abandon their transhumant lives, their traditions and total loss of their identity and culture. 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 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. In Changthang, the 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, Partition and Indo-Pakistan Wars

After independence, Ladakh became a part of the Indian state of Jammu and Kashmir and Baltistan became part of the Pakistan. Bloodshed due to partition of India left Ladakh untouched and Muslims and Buddhists continued to live side by side. In 1948, Ladakh was invaded by Pakistan, then in 1965 and in 1971. In 1999 Kargil- the other city of Ladakh was the scene of fighting.

Chinese Aggression

In 1949, China closed borders between Nubra and Sinkiang province. Traditional routes between India and Central Asia were blocked. In the 1950, Chinese forces invaded Tibet, resulting in Lhasa uprising in 1959. The Chinese forc-

es invaded Ladakh and occupied 28,500 sq. km of Aksai Chin in the north-east of the region, where they had built roads connecting Tibet and Sinkiang. In 1962, the Chinese launched a massive attack on Ladakh. Simultaneously, China closed the Tibetan border and broke 700 years old parental links with the gompas of Ladakh and Tibet.

Building of Roads and Highways

The strategic position of Ladakh encouraged massive military build up. Continuous military transport necessitated the start of military air services and the building of the Srinagar- Leh road, which completed in 1962. Proximity of the Chinese on the one side and the Pakistanis on the other and joint construction of the Karakoram highway posed a real threat to Indian security.

Indo-Tibetan Border Police (ITBP) has four battalions and has one core in Ladakh region. Both army and Para-Military have a number of posts in Changthang region. Motorable roads provide better access to the mountain valleys. With the spread of roads, for Indian army, transportation by motor vehicles has spread in the area and use of yak as a beast of burden has reduced. The advent of roads has prompted the Changpas to buy motor vehicles, trucks, small vehicles and motor cycles etc.

Loss of Winter Pasture and Salt Trade

With the closure of border, the nomads of Changthang suffered profoundly. They lost their winter pasture at Skagjung near the Tibetan border and lost their salt trade, which they were carrying on along with their pastoral work. Skagjung is the main pasture where the entire nomad population of Samad and Korzok was coming for five-six months of winter. Skagjung is a very rich huge pasture, with relatively low altitude, little snow and plenty of grass. As a general rule Changpas preserved rich pastures of Chumoor and Skagjung for winter use for their herd. At Dungti, a motorable bridge was constructed for animals to cross over to other side of Indus for grazing, in the Indian Territory. However, that bridge was removed, because Chinese objected to it. Chinese are sending their livestock for grazing to Chumoor in the Indian Territory during six months of winter. Even at the time when the Changpas of Samad and Korzok were going there

with their livestock for winter grazing Chinese used to enter the Skagjung in the Indian Territory and harass the Changpa nomads. The Changpas traditional winter pasture shrunk considerably after China captured large portions of Skagjung and other pastures, in the Kuyul area. Indian and Chinese army posts were set up in the areas, which restricted the movements of nomads. According to the project report on the development of *pashmina* by Leh Animal Husbandry, a large portion of pastures reserved for the use in winter at Skagjung are grazed by animals brought from the Chinese side in summer. On the other hand, the movements of the Changpas of Indian side are restricted along the border.

Skagjung could still provide good grazing areas for the yaks, but these pastures are at high altitude and it is difficult for sheep and goats to climb. It takes seven to eight days journey to reach Skagjung from Korzok and many yaks for carrying heavy woolen *rebos* and lots of other equipment. Since the Changpas could no longer enter Tibet for salt extraction, it was not worth making so much effort only for yak grazing. Consequently, Changpas stopped going to Skagjung for winter grazing.

Influx of Tibetan Refugees

After the Lhasa uprising in 1959, number of Tibetans crossed the border and entered Changthang along with their livestock. Since then these Tibetans have been staying as refugees. The introduction of these Tibetans disturbed the existing balance of livestock and pastures, as 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.

Change in Grazing Pattern

The turmoil in Tibet and war saw an influx of Tibetan Refugees in Eastern Ladakh. 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. 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 shifting their camps from four- five to eight to ten times in a year, which meant more work and hard labour. Traditionally, Changpas had large herds of 1000 sheep and goat, 80-90 yaks and 10-15 horses and poor Changpas had a flock of 200 sheep and goats and three-four yaks. 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 Zanskar 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.

PASHMINA TRADE AND INCREASE IN GOAT POPULATION

In addition to brick tea and salt, another important commodity that was coming from Tibet was *pashmina*. The war of 1962 with China resulting in closure of border ended all Tibetan *pashmina* export. The demand for Changpa's *pashmina* increased overnight and Changpas economy took a new turn. This brought an increase in number of *pashmina* goats. 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.

The *pashmina* wool was initially traded on behalf of the rulers of Ladakh, the *Gyalpos*. The *Gyalpos* appointed agents known as *kha-stong*, who were all Arghons¹. By ancient customs, some privileged traders arrived from Gortok and Rudok to buy wool and interacted with Arghons, who exclusively controlled the wool-trade of Changthang in Ladakh under the treaty of 'Treaty of Tingmosgang'. All this was to change, only after the forces of Dogra General Zorawar Singh (representing Maharaja Gulab Singh) conquered Ladakh. The *pashmina* was one of the main reasons of the Dogra invasion. In addition to the palace traders, traders from other parts of Ladakh also started arriving. These Ladakhi traders

acted as intermediaries. They bought raw fibre from Changthang and sold the same to Kashmiri traders for *pashmina* shawl industry. With the entry of the traders from Leh, the traders from neighbouring valleys stopped coming to the region, as they could not afford to buy raw fiber on such high rates. The farmers from lower and central Ladakh no longer visited the area for purchase. Some traders from Himachal Pradesh still come to purchase wool from this area. In the last fifteen years, the increased economic value of *pashmina* has caused changes in the trade. In addition to traditional buyers from palace, Leh, Himachal Pradesh, a new group of the Changpa traders has emerged. The Changpa group consists of men from families of Changthang who have migrated and settled in Leh. The main portion of the trade still remains in the hands of Muslims, which saw a bad period between the summer of 1989 to 1992, when Ladakh Buddhist Association (LBA) called for social and economic boycott of Muslims. During the boycott, the LBA tried to promote new Buddhist traders, who they thought would take over the trade and infringe the domination of the Muslims in the *pashmina* trade. The new traders, the Changpas who were used to barter could not understand the working of the trade and subsequent to the revoking of the boycott, traditional pattern was resumed. Because of this rapid increase in the price of *pashmina*, the government of Jammu and Kashmir attempted to control the *pashmina* trade. They set up the Jammu and Kashmir Wool Board, which via raw *pashmina* wool (Control) Order gave them the right to prescribe the price of *pashmina* and prohibited the export of *pashmina* outside the state of Jammu and Kashmir without the prior permission from the government. In 1972, the state government set up *pashmina* goat farms in Upshi and Nyoma in Changthang with the aim of breeding high quality goats. In all the three communities of Samad-Korzok and Khar-nak, the proportion of goats has increased (Sheep Husbandry Department 2002). 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. Same change was observed among the Tibetan nomads: "Since the price of cashmere is rising much faster than wool, goats may well

end up the basis of a new affluence for the nomads (Goldstein and Beall 1990).

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.

TOURISM

Adventure tourism in Ladakh started in the 19th century. Ladakh was virtually closed to the outside world from the end of World War II up to 1974, when it was opened to tourists. About 18,000 tourist visit Ladakh every year. The Changthang area was opened to tourists in 1994. 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 those on four wheels. Though tourism has not benefitted the local Changpas, as it employs low percentage of the working population, yet tourism has brought local people in contact with outsiders. Initially the Changpa nomads were not part of tourism activities as everything was organised from out of Changthang. The local Changpas have also started making private boarding and lodging arrangements for trekkers and tourists who come privately on motorbikes etc. The communication with tourists and people living in larger cities also increased ambitions of the local population for a better way of living. With the advent of money into their economy, it was possible for the Changpas to educate their children. The use of money reduced the importance and need of social barter. The area is connected by land and air. Until 1979, there was no civilian flight into Ladakh, though defense flights were regular. Even now, the main highway remains close for six months in a year because of harsh weather conditions. Initially, the tourists were not allowed in Changthang region as this area was restricted to outsiders as it lies within 'Restricted Area Zone'. It was accessible to only Indian citizens, that too with prior permission from the Deputy Commissioner of Leh and only for a limited period.

THE END OF POSITIVE RESTRAINS TO REDUCE FERTILITY

In addition to economic strategies, the Changpas used positive restraints to reduce fertility. Family and marital structure and mode of inheritance maintained population at low level. Monogamous system with fraternal polyandry monasticism limited population while maintaining an effective labour force in the household.

Today polyandrous marriages are becoming less, since it is not a legal form of marriage. The cohabitation of brothers with a wife of one of them is purely informal arrangement for economic benefit. There is a change in inheritance pattern. Primogeniture, eldest son inheriting the *rebo* and livestock, is also under strain. Decline in the temporal role of religion; introduction of the 'Buddhist Polyandrous Marriage Abolition Act', equal inheritance among siblings, individual rights; and opening of Ladakh to tourism in 1974, are the major impulses symptomatic of changes in the environment, population dynamics, economics and sociocultural value systems.

PROTECTED AREAS

The marginal land of Changthang, the home of the pastoral nomads has come into focus as the reserve of biodiversity. Changthang's very inaccessibility has allowed the survival of species. This has put the government under pressure to declare the whole region of Changthang as protected area. The demand of conservationist lobby and the potential income from tourism made this possible. In 1987, the State government had notified its intention to constitute Changthang as Wildlife Sanctuary along with other two regions of Ladakh. The creation of protected areas poses new threats to the very existence of the Changpas and their livestock. 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. Many of the Changpas tents are near the lake, if this area is out of bounds for taking their animals to pasture, it will threaten their traditional subsistence pattern.

Some rare and threatened animals like snow leopard, Tibetan wolf, Tibetan argali, wild yak,

Tibetan gazelle and the Tibetan antelope inhabit the area. One of the most endangered birds, the Black Necked Crane, breeds in the marshes of Lake Tso-Moriri before departing to its winter home in north-east India. The Supreme Court order of September 2002, restricts human activities in protected wildlife areas and to reserve Pangong Lake for many species of migratory birds. However, this has engendered conflicts between protected areas, managements and local communities that suffer from restrictions on their economic activities.

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. For example, the black-necked crane is highly sacred to the Changpas. The arrival of this species in summer is a good omen for the year. Tso-Moriri is also sacred, and people do not take bath in it or do any thing that will pollute the water. The Changpas have an old history of resource utilisation according to their traditional systems. The decisions by Jammu and Kashmir government to declare the Changthang region of Leh district a high altitude wildlife sanctuary has put Ladakh's Changpa nomads in a fix. 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.

The Changpas have always been maintaining the homeostasis in the area. According to the Changpas, factors like the presence of army, influx of TRs and their livestock and tourists in the area are a threat to wildlife, who do not essentially ensue the practices of restraint and mobility of the Changpas. Construction of roads and influx of human and animal population resulting in severe erosion of some pastures is having negative impact on the Tibetan argali and Tibetan 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.

However, there is no clear policy with legal, institutional and planning frameworks for sustainable development in Changthang. Wildlife development is a specialised field and requires skilled workers to implement the integrated development programme. Development of animal husbandry is a major government goal. For development of animal husbandry, infrastructure like fodder banks and animal husbandry stations in different parts of Changthang have been started. Western development experts' help and opinions are being sought. The impetus to increase livestock productivity by scientific methods is strong in Changthang. However, intervening in fragile environments with complex ecological systems is a difficult undertaking. Many pastoral programmes in other areas of world have resulted not in progress, but rather in destruction of the way of life of the inhabitants and an environment in poorer condition than before (Swift 1977; Helland 1980; Sandford 1983; Swift and Maliki 1984; Ellis and Swift 1988). To avoid this, it is extremely important that planners understand the traditional livestock management systems.

Changpas rationally make use of their resources, and are perceptive and practical pastoralists. 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.

Instead of pinpointing the focus areas of biological importance, the authorities have outlined the whole of the Changthang for sanctuary. However, it was seen that conservation has mostly remained nominal inside these PAs due to the poor infrastructure including low staff strength, proper designation of boundaries that include many settlements and disputed international boundaries, lack of implementation of park rules or inability or incapacity to implement these (Bhatnagar et al. 2006; PSI 2006). The PAs in Changthang still have human settlements and are subject to persistent human use. In late 1990s, attempts were made to relocate population in the Pin Valley NP, Spiti but were met with stiff

resistance. Here in Changthang relocation is not a plausible approach for conservation due to a variety of reasons. The wildlife including endangered ones is pervasive in the larger landscape. Traditional use of land by people for marginal cultivation and pastoralism is insidious in this environment. However, scarce resources, the lack of alternatives and the traditional practices of precise division of all useable areas and pastures between communities make resettlement of people outside PAs extremely difficult.

The Biodiversity Conservation and Rural Livelihood Improvement Project (BCRLIP) were conceptualized in 2005 to resolve the conflict between man and animal among people living on the fringes of important protected areas. The primary aim of the project is to engage local communities in sustaining biodiversity conservation while improving their livelihood.

SUSTAINABLE DEVELOPMENT, PROTECTED AREAS AND OUT MIGRATION

The Changpas with modest physical assets, with limited education and feeble claims to public goods are lagging behind in overall development. Apart from physiographic and techno-ecologic handicaps, region's low level of literacy hinders socio-economic development. Development in the Changthang is linked to the overall development of Ladakh. Ladakh had an important place in the region. The economic gains of crossroad trade were limited to Leh and a few of the surrounding villages. Most Ladakhi villages were self-sufficient and self-sustained agricultural communities. The customers of *pashmina* wool, produced in Changthang were outsiders. The gains from *pashmina* trade for the most part evaded the rest of Ladakh.

Since the incorporation of Ladakh into national streamline, the traditional way of life of the Changpas has been changing. The resultant changing conditions due to above listed factors are pushing the Changpas to emigrate. The Changpa lost their winter pasture at Skagjung near Tibetan border and lost their salt trade along with it. Recurring snow disasters have also decimated herds. During winters the food and fodder becomes scarce. The Changpas main concern is to prevent impoverishment from this type of scarcity. The government and non-government agencies are continuously helping the

Changpas through various development schemes and given food and fodder, trying to bring them into the mainstream of the society and to lessen their dependence only on pastoral activities. They are threatened repeatedly by the vagaries of nature. For the development of *pashmina* in Ladakh, various projects are going on. Poorer households are provided with small livestock loans to increase their income and breeding stocks. The government instigated various development plans in order to improve the socio-economic conditions of tribals and other weaker sections of society. In the last few years, Changpas have suffered greatly as weather gods went against the normal routines. It came in the form of unusually heavy snowfall in late September followed by severe cold weather, which prevented snow from melting. Additional snowfall deposited more snow, resulting in winter grazing buried under a meter of snow. This led to starvation and death of livestock in large numbers. Economic losses from livestock for the Changpas were enormous who depended entirely on livestock for a livelihood. Organisation, management and planning of the Changpa economy and coping strategies are always towards the goal of keeping alive and stay out of debt. The Changpas have their traditional strategies to deal with severe cold. They dispose off a number of old, weak and sick animals before winter months and purchase as much grain as they can afford. 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. They have been facing such hardships for a long time and are a deprived lot. Their deprivation is not just a matter of consumables and wealth but also one of helplessness and exposure to vagaries of nature. Under such circumstances, most crucial government aid comes in the form of emergency relief as a response to drought or severe winters. 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. During winter, medical help is not available to the human as well as animal population.

There is conflict with the wildlife around the encampments. Frequently wild animals attack

and kill sheep and goats and the Changpas have no safety mechanisms to prevent this. The herds are kept in pens, if not they are prospective targets of predators. The wolf-pack generally stampedes the herds. After the flocks are scattered in the hills, wolves pick these one by one. Like this, many sheep and goats are lost in one attack. In some areas, the government pays compensation for such losses, but it is a long procedure and nomads do not bother. Snow leopards commonly attack the Changpas' male yaks and horses that are left unprotected in the mountains to graze. The Changpas use indigenous traps to catch snow leopards, and wolves in which they are rarely successful.

Hence, the Changpas were looking for other options. Employment opportunity in government sectors was limited as majority of the population was illiterate. The earlier employments were mainly as casual labourers in army bases or on border roads. In the new money economy that Changthang has been thrust into ever since it was opened up to the outside world in 1994, tourism has come up as most prominent sector. If handled properly with a marketing initiative to support it, the tourist industry can solve a number of problems of the Changpas.

Besides these pushes there are pulls of prospects of better education for children and good medical facilities for the sick. The development in Ladakh was set in motion after 1962 by government agencies. Ladakh is only part of India with a border with both China and Pakistan and stands facing danger from both the fronts. Government made available roads, subsidies, grants and loans for the betterment of trade. Flexibility, movements and risk aversion have been the most important strategies adopted in the changing environment in Changthang. The placement of army bases in Changthang provided job-opportunities for the Changpas. Like other parts of Ladakh, the employment commenced cash economy in Changthang as well. Until this time, the area remained comparatively isolated, though pastoral households have always been part of largescale economic and social structures. Among the Changpas, such integration has provided the basis for the continued viability of pastoral adaptations. 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. Roads built for strategic interests work as agents of change.

This caused change in their thought process and they too started aspiring for a better life, education for their children and medical aid for their families.

Veterinary care, controlled price rations through Public Distribution System (PDS) and education came within reach. Education occupies an important position in the social and economic development. The importance of education in India is evident from the large budgetary allocation in the National Development Programmes. However, it is difficult to educate the Changpa population. The opening of schools and health centres brought no change in the lives of the Changpas.

Though the development programmes and the official propaganda increased the expectations of the local people, the implementation was not as successful. The Changpas did not benefit from these as the education, medical facilities were stationary, and the population of the area was mobile. The government started mobile tent school in Samad but recently discontinued the practice and established a residential school in Dumdo, creating a problem for these nomads. The government servants whose job is to run school and health centre here were from outside the Changthang and unwilling to stay yearlong. Solar heated residential schools in Changthang are in progress since 2001-2002. This may solve many problems of the nomadic Changpas in remote villages who want to educate their children.

The Changpas have always had to exchange some pastoral products with outsiders in order to acquire basic foodstuffs and other necessities of the household. They exchanged animals, animal's products and salt for barley and other household necessities. Cash played minimum role in the Changpas' lives and household economies. The introduction of a Public Distribution System (PDS) of food grains was an important factor of change. This led to altering food habits and less reliance on barley, their staple food. Rice has become the favourite food of the young Changpas. Even women prefer rice as it is easier to cook and takes lesser time. When Changpa started getting grains at their doorstep through PDS, they felt no need to travel long distances with animals laden with wool and salt for bartering.

For buying food grains from the shop, the Changpas require cash. For earning cash, it is essential for the Changpas to have some means, either large herds or other avenues of income.

They cannot afford to expand their herds because herd expansion is closely tied to winter forage. As the area has no potential for industrial growth, they start thinking of migrating. They migrate with their families from their residential areas to Leh town and its surrounding areas and look for other alternatives, mainly labour. One of the most significant social changes prompted by the increased connection and the growing prosperity has been the disappearance of fraternal polyandry. The growth of nuclear families has resulted in increase in human as well as livestock population. Simultaneously, there was an increase in the number of tourists, their pack animals and the large number of supporting and attendant staff aggravating the already distressing situation. The Changpas migrate either because of dwindling resources or for the betterment of their children.

Rural to Urban Migration

The Changpas are not entirely detached from social and economic environments that have seeds of social modernisation and economic development. However, the process of sedentarisation and settlement of the Changpas to these economic and social structures has gained momentum in recent years. Sedentarisation was not a large-scale collective event. Every now and then, few individuals or families migrated between a nomadic way of life and sedentary life style and back depending on the circumstances. With the change in political circumstances and government policies of providing the economic opportunities, the nomads of Changthang are experiencing important changes. Some of these changes are good for these people but others are not. One of the most undesirable outcomes of these changes is the threat of emigration in these communities. Present day pastoral pattern should be viewed as rational responses to everchanging conditions. Over the past four decades, the many original Changpas of Samad-Korzok and-Kharnak have settled in and around Leh town. It is a dynamic evolution whereby the Changpas alternate between varying degrees of nomadic and sedentary modes of living.

The area has been invigorated by market reforms causing unprecedented rate of change, which these pastoral communities are facing. 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 percent 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. In the three Changpa communities, the degree and character of out-migration varies. 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 outmigration is different. The community level factors play an important role in arresting the out-migration.

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 for more than two years due to restrictions regarding taxes and traditional village duties. Hagalia (2004) reports that in Samad these rules changed in 2003 and it is not permissible to keep animals in the encampment for absentees. 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 studies, work or retirement. In cases, where retired parents are staying in Kharnakling, the young parents leave their children for studies with the grandparents and lead 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 pastoral work. They faced many difficulties in settling there that too with the help from the family members or relatives who stayed back in the Changthang. Remittance is 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. Changpas have shown extremes in continuation of adaptation from full-time nomadic pastoralism to full time wage-employment. Changpas think that salaried employ-

ments are good because of regular income and food security. Changpas have positive attitude towards education. Investment in education among Changpas is a viable means of acquiring salaried employment, long-distance trade and shop ownership. Access to formal education is a condition for attaining salaried employment. Here, school level or secondary education can help pastoralists to attain waged employment.

Kharnak

In the case of Kharnak, over the last twenty years, large numbers of families have moved from Changthang. From Kharnak, about 80 percent nomadic pastoralists have emigrated to Leh, in Kharnakling colony. This locality has become a meeting place for visitors from Samad, Korzok and Kharnak. 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 IndoChina war of 1962, the Samad Changpas claimed their traditional winter pasture creating difficulties for 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 the 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. Anyone 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 condi-

tions. 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.

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 them 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 any foreign language. However, they know their terrain well and can transport food and goods around the area in their trucks. Those who own vehicles and do not drive, become navigators or guides. 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 pastoral 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 institutions and 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 gompa 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 gompa and the resultant wrath of god is more acute than ever. Smutylo (2008) narrated the incidence of a lama who was scheduled 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 healthcare facilities in Kharnak. Traditionally, the lineage *amchi* had a monopoly on medicine giving, and in exchange the villagers helped him 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 only medical practitioners but also serve as consultants and advisors in the village affairs as well. 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 the returning of a fellow villager if somebody wants to do it.

Korzok

In comparison to these two communities, the rate of emigration to Leh is low from Korzok. The Changpa community of Korzok is composed of two parts, the permanently located (*Yulpa*) in Kozok and nomadic pastoral population.

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

With increasing recognition to preserve environment along with development of tourism in this resource scare area, community based ecotourism is being promoted in this area (Worldwide Fund for Nature-India). As unplanned tourism was posing threats to Korzok village on the banks of Tso-moriri (designated Wetlands of international importance or Ramsar site (Gujja et al. 2003), conservation of high altitude wetland is of prime importance along with the needs of generating alternate livelihood opportunities.

Studies have shown that tourism effects at both micro and macro level. At micro level, tourism provides local population an opportunity to create an extra source of income than preventing out migration besides upgrading living condition (Lorio and Corsale 2010). At macro level it helps maintaining the social structure of the community as it creates Job opportunities which put an end to displacement of population (Anand et al. 2012).

The homestay model of Korzok as in other parts of Ladakh and India is designed on the principle of unbiased approach and can be adopted by any household across population. Before recommending homestays among Yulpas of Korzok, the 23 permanently settled Changpas families were consulted. It was necessary to know about Changpas culture and traditions of reciprocities, rules and regulations. A homestay is different from the hotel because it entails owners sharing their beliefs, experiences and lives with outsiders. The participation of locals as stakeholders play an important part in conservation of environment and earning money to add to their meager resources.

The Changpas are simple people, so they were trained to deal with outsiders. The recourse

person were fellow Ladakhis who had been running homestays near Hemis National Parks. Youths were trained to be wildlife guides (for details see Anand et al. 2012).

Not much construction was needed as traditional homes and monasteries' are built of stones packed with mud and wooden roofs which can withstand heavy snow fall².

The Ladakh region has an extensive surface water system which could be tapped due to gravitational problem. Water is divided according to the inheritance fraction which each holder represent by virtue of his position in his genealogical tree (For details see Bhasin 1992).

A major challenge facing environmental and development organisation is the human waste. This form of waste needs proper depositing and recycled. The Changpas of Ladakh follow the method using traditional lavatory (*Chaksa*) (For details see Bhasin 2002). 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 under-representation of young people in the migrant population.

This is because, the young population between the ages of 10 to 18 constitutes the major working force in the household work and is 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 cultural tradition. 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; Blaikie 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 land 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" (Goodall 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" (Goodall 2004). A process occurs-whether originating in external pressure, inter spontaneous adaptation and response to both -which generates 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 the 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. The Changpa families, who have migrated

and settled near Leh town pursue alternate livelihoods that include wage labour, trade, guides and helpers with tour operators and government jobs. 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.

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 socioeconomic life of the people.

The process of migration from Changthang started three-four decades back. In the initial stages, the out-going process was slow. It did not shatter the community's social and religious life, as the number of out-going people was small. At that time, the out-going families had individual reasons to abandon their traditional way of life. The first families to leave Korzok, as well as Kharnak, were either very rich or very poor. The rich aspiring migrants tended to have good information outside the community. Using their contacts, they bought land and invested wealth in and around Leh. The very poor also migrated at the same time as they had nothing to lose. The economy of Leh does not offer highly attractive employment opportunities, as Changpas are not skilled or trained for any work. The wage difference between the place of destination and origin is not great and in many instances, less. It has been shown by studies that eco-

nomical factors have limited explanatory power in relation to migration (Massey et al. 1998). Many Changpas have migrated to Leh without any economic incentives. They migrated to Leh to educate their children, so that children could have a secured life with regular employment. However, as the process of out-going has gained momentum, it points towards the broader social and economic changes in the region. The recent migrations are the outcome of the slight shift in awareness among the communities because of development programmes, tourists, and exposure to media, visits from NGOs and from trusted kin returning from Leh. It is mostly men who have access to new information because of traveling beyond pastoral areas and contact with outsiders. Migration is a household level decision taken within a broader context of structural change. Apart from stress in continuing the mobile way of life with shrinking winter pasture and abnormal weather conditions, communications with tourists augmented local aspiration for an improved way of life. The injection of money into the economy helped local people sustain the changes in their lifestyle. All the three communities are subject to similar structural conditions. But their response and levels of outmigration from each community are different. The community level factors play an important role.

The government of Ladakh generates a large amount of revenue from this area and wants to stop this out-migration. Without the Changpa nomads and their herds, there will be no *pashmina*. For the last ten years, the government is initiating plantation of willow trees to stop desertification. Government is offering Rs. ten for planting one tree and fence. This has not been successful as goats in spite of barbed wire eat the saplings. Besides this, the shortage of water and lack of moisture in the air does not help the plants to grow. A several mile long canal was taken out to transform the stony stretch into green meadows. Nevertheless, the flow of canal was not good enough in June for irrigating the plants. Finally, the government chose to distribute granulated fodder, a practice that experience has shown in other regions of the world, is ineffective in long term.

For the betterment of the Changpas, the Government is trying to improve the infrastructure. After failing in the construction of buildings with concrete walls and roof sheets, materials not adapted to fluctuations in temperatures and

strong winds that characterise the region, they are building storehouses of stones with carved doors and window for winters. It has also funded the construction of tracks between settlements, installed hydraulic pumps for water in off-season, when the daytime temperature has melted snow around the camps, but insufficient to melt on the peaks. After all these efforts, the out-migration has not stopped. To counter this emigration, government has proposed that Changpas should settle at one place and build permanent homes. Government suggested two places, Thugje and Tasa Phug that have permanent water sources.

CONCLUDING REMARKS

Changthang's unique landscape, rich biodiversity and high number of endemic species, makes it a special area for conservation. In 1987, the State government had notified its intention to constitute Changthang as Wildlife Sanctuary along with other two regions of Ladakh. The main challenge for the authorities in advance of the implementation of a large protected area is the communication of its benefits and needs to interest groups, which are concerned. At the same time, it is difficult to convince the local population about the advantages of a protected area, because they are wary of restrictions being imposed on their rights and activities. Their typical fears are the loss of decision-making ability, the dictate of land use, economic disadvantages, or the loss of personal freedom. 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.

Wildlife conservation, Protected Areas and the livelihoods and development needs of the Changpas are contrary. Protected areas are often perceived as benefiting only nature and biodiversity. According to Mose (2006), protected areas are socially constructed "landscapes of hope". Sociologists have detected a large change in paradigms, bringing protected areas from the "static-preservation approach" to a "dynamic innovation approach" (Weixlbaumer 1998). These new approaches are characterised by: nature conservation as a general concept of spatial and integrated rural development instead of separating nature conservation and econom-

ic development. All these theories are correct from scientific point of view but the Changpas do not acknowledge these. 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 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 Changpas 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 pastures are forcing the Changpas to abandon their nomadic lives, their traditions and total loss of their identity and culture. Traditionally, under such conditions, 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 Changpas 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 of Kharnak 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 reserved 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 Changpas 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 ultimately 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.

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.

Communications with tourists augmented local aspirations for improved standards of living as well. The introduction of money into the economy facilitated local people and sustained these changes 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. Each Changpas 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 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 values. Though the landscape remains punctuated by the traditional black tents *-rebo* and livestock, it is also marked by new white canvas tents. Changpas have bought vehicles and have started using trucks during migrations for carrying household goods. Likewise, educated Changpas are not interested in the 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, prefer partition into smaller nuclear families, even though they work collectively (Bhasin 1988). By the changes brought in the area with the opening of the same for tourism, introduction of education and moving out of the area, the young Changpas are opting out of the polyandrous system of marriage. With the increase in number of nuclear families, the population of Changthang is on the rise. Pastoral nomads system is particularly sensitive to population growth, because the environment here has no potential and technical possibility for raising productivity and tend 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 a cash crop and is sold for cash.

As a result, of the above-mentioned factors, Changpas have to look for new strategies in addition to traditional strategies of mobility and herd diversification to meet 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, 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 livelihood 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. 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 Changpas 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 females' (girl's and women) 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 Changpas 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 affected 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 become 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 areas 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' 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 Changpas 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 Changpas herders invested in land and in transportation, while poor Changpas herders are working as labourers at construction sites or with tour operators to act as porters. These jobs are extremely labourious and generate little income.

The Changpas have always been mobile, but this migration is a complex process, embedded in the Changpas responses to three-four decades of rapid change. Causes and consequences of out-migration among the Changpas show that the traditional adaptive system is under stress and strain. 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 with assistance from government and non-government agencies. Agriculture Department, Leh has enabled cultivation of grains and forage. Presently, almost 70 percent 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 Samad-Korzok and - Kharnak, where Changpas responded differently. In Korzok, they opted for tourism and homestay and in Kharnak people are moving to urban centre Leh. Number of Changpas in Korzok are operating homestay programme in Korzok, offering tourist a comfortable place to live in with local food. As these area are without hotels. This has also resulted in income generating in these isolated areas and boosting tourism. The strategy of homestay operating in proved successful in isolated valley of Lachen and Lachung in North Sikkim (Bhasin 1989). In 1982 these areas were prohibited to outsider and new tourism, is a burgeoning industry.

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. As already mentioned that breaking up of traditional laws of inheritance (primogeniture) and polyandry which helped Changpas to carry on pasturing duties with more hands and polyandry assisted in control of population. 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 schools, 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 lose 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 the Kharnak community 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 cannot 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 that the 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 socioeconomic 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 Changpas 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 become 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 sources throughout 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 ecosystem 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 adapta-

tions 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. However, another analogous area in Changthang shows a different type of adaptation. A study has been carried in the Hanle Valley, located at about 270 km. southeast of Leh the district headquarters (Namgail et al. 2007). The data was carried out between June-August 2004, and January-March 2005. They carried out fixed work in six villages with a population of 1500. The data was collected among Changpas as well as Tibetan Refugees.

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 Changpa 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 the grievances of the people.

NOTES

- ¹ Arghons were the descendents of immigrants from Kashmir valley and Central Asia who intermingled with the local Ladakhi community.
- ² However these houses and monasteries cannot face frequent rain coming seepage and erosion problem. However Changthang does not face such problem and Changpas home remain the *Rebo* (tent). It has been reported by researchers that two decades have seen increasing rain and correspondingly less snow. The flash floods of 2010 and landslide killed over people near Leh.

REFERENCES

- Ahmed Monisha 2002. *Living Fabrics: Weaving among the Nomads of Ladakh Himalayas*. Trumbull, USA: Weatherhill, Inc.
- Ahmed Monisha 2004. The politics of Pashmina: The Changpas of Eastern Ladakh. *Nomadic Peoples*, 8(2): 89-106 (2004).
- Anand Anupam, Chandan Pankaj, Singh Ram Babu 2012. Homestays at Karzok: Supplementing rural livelihoods and supporting green tourism in the Indian Himalayas. *Mountain Research and Development*, 30(2): 126-136.

- Bhasin Veena 1988. *Himalayan Ecology. Transhumance and Social Organisation. Gaddis of Himachal Pradesh*. Delhi: Kamla-Raj Enterprises.
- Bhasin Veena 1989. *Ecology, Cultural and Change: Tribals of Sikkim Himalayas*. New Delhi: Inter-India Publications.
- Bhasin Veena 1996. *Transhumants of Himalayas: Changpas of Ladakh, Gaddis of Himachal Pradesh and Bhutias of Sikkim*. Delhi: Kamla-Raj Enterprises.
- Bhasin Veena 1999. *Tribals of Ladakh: Ecology, Human Settlements and Health*. Delhi: Kamla-Raj Enterprises.
- Bhasin Veena 2002. Traditional knowledge research: recycling human waste among Ladakhis. *J Hum Ecol*, 13(3): 177-180
- Bhasin Veena 2012. *A Desert in the Sky: Life on an Edge among the Changpas of Changthang*. Delhi: Kamla-Raj Enterprises.
- Bhasin Veena 2012. Life on an edge among the Changpas of Changthang, Ladakh. *J Biodiversity*, 3(2): 85-129.
- Bhatnagar YV, Wangchuk R, Pris HHT, van Wieren Se, Mishra C 2006. Perceived conflict between pastoralism and conservation of the the Kiang Equas Kiang in the Ladakh Trans Himalaya, India. *Environment Management*, 38(6): 934-941.
- Bishop Isabella 1894. *Among the Tibetans*. London: The Religious Tract Society, 1904.
- Blaikie C 2001. *Why do the Nomads Settle? Livelihood, Sustainability and Rural-Urban Migration among the Kharnak Community of the Chang-pa of Ladakh*. MSc Dissertation. London: University of London.
- Burton I, Kates RW, White GF 1993. *The Environment as Hazard*. 2nd Edition. New York: Guilford Press.
- Census of India 2001. *Provisional Data*. Web Edition. From <www.census.India.net.>
- Chaudhari A 1999. The Changpas of Rupshu-Kharnak. An Inquiry into the Survival Strategies of an Amazing People. *Unpublished Report of Action Aid*, New Delhi (1999).
- Cunningham A 1853. *Ladak, Physical, Statistical and Historical with Notices of the Surroundings Countries*. Simla (1853). Reprinted. New Delhi: Sagar Publications, (1970).
- Dainelli Giatto 1932. Expedition to the Eastern Karakoram 1930. *Himalayan Journal*, 4.
- Darrah HZ 1898. *Sports in the Highlands Kashmir*. London: Rowland Ward.
- De Haan A 1997. Livelihood and poverty: The role of migration. A critical review of the migration literature. *Journal of Development Studies*, 36(2): 1-47.
- Dollfus P 1999. Mountain deities among the nomadic communities of Kharnak (Eastern Ladakh). In: M Van Beek, K Brix Bertelsen, P Pedersen (Eds.): *Ladakh: Culture, History and Development between Himalaya and Karakoram*. Aarhus, Denmark: Aarhus University Press, pp. 92-118.
- Drew Frederic 1875. *The Jammoo and Kashmir Territories. A Geographical Account*. Edward Stanford. London (1875). Reprinted, New Delhi: Cosmo Publications (1976).
- Ellis JE, Swift DM 1988. Stability of African pastoral ecosystems: Alternative paradigms and implications for development. *Journal of Range Management*, 41: 450-458.
- Francke AH 1907 *Ladakh, The Mysterious Land* (1907). Reprinted, New Delhi: Cosmo Publications (1978).
- Goldstein Melvyn C, Beall Cynthia M. 1990. *Nomads of Western Tibet the Survival of A Way of Life*. University of California Press Berkeley Los Angeles.
- Goodall Sarah K 2004. Rural to urban migration and urbanisation in Leh: A case study of three nomadic pastoral communities. *Mountain Research and Development*, 24(3): 220-227.
- Gujja Biksham, Chatterjee Archana, Gautam Parikshit, Chandan Pankaj 2003. Wetlands and lakes at the top of the world. *Mountain Research and Development*, 23(3): 219-221.
- Hagalia Wenche 2004. *Changing Rangelands Use by the Nomads of Samad in the Highlands of Eastern Ladakh, India*. Master Thesis, Agriculture University of Norway.
- Heber A Reeve, Heber Kathleen N 1923. *Himalayan Tibet and Ladakh*. London (1923), Reprinted, Delhi: Ess Publications (1976).
- Helland J 1982. Social organisation and water control among the Borana. *Development and Change*, 13(2): 239-258.
- ICIMOD 1998. Conclusions and Recommendations for Rangelands and Pastoral Development in Hindu Kush Himalaya. Online Report by the International Centre for Integrated Development. From <www.icimod.org> (Retrieved on 5 May 2003).
- Iorio Monica, Corsale Andrea 2010. Rural tourism and livelihood strategies in Romania. *Journal of Rural Studies*, 26(2): 152-162
- IPCC Report 2001. Climate Change Report 2001. The Scientific Basis Contribution of Working Group, II and III to the Third Assessment on Climate Change. Report of the Intergovernmental Panel.
- Jina PS 1995. *High Pasturelands Ladakh Himalayas*. New Delhi: Indus Publishing Company.
- Keenan J 2006. War on terror: The implication of America of New Imperialism for Saharan Peoples. *Journal of North African Studies*, Special Volume.
- Khan GM, Wani MY 1986. Soil and Water Management in Increasing Productivity of Crops in Cold Arid Region of Ladakh. *Proceedings: National Seminar-cum-Workshop on Development of Cold Desert of Ladakh*. Leh Desert Development Agencies, 23-25 September, 1986.
- Khazanov AM 1984. *Nomads and the Outside World*. USA: Cambridge.
- Kitchloo NA 1977. *Unified Ecosystem Wildlife Plan for the Wilderness Area*. Department of Wildlife Protection. Jammu and Kashmir Government, Srinagar.
- Leh Nutrition Project 1993. *A Joint Report Submitted by Ethnographic and Visual Archive and Leh Nutrition Project*. P. 6.
- Marx Karl 2006. *Capital. A Critique of Political Economy*. Vol. 1. Harmondsworth: Penguin Books.
- Massey DS, Arango J, Hugo G, Kouaouci A, Pellegrino A, Taylor JE 1998. *Worlds in Motion: Understanding International Migration at the End of the Millennium*. Oxford: Clarendon Press.
- Moorcroft W, Trebeck G 1837. *Travels in the Himalayan Provinces of Hindustan and the Punjab, in Ladakh and Kashmir, in Peshawar, Kabul, Kundwz and Bokhara*. In: HH Wilson (Ed.): 2 Volumes. London: John Murray (1837) Reprinted, London: Oxford University Press (1979).

- Mose I 2006. Protected Areas and Regional Development. Materials for the M.Sc Programme. Management of Protected Areas. Klagenfurt: University of Klagenfurt. Unpublished. c.f. Protected Areas: Biological Diversity as an Investment. From <alpsknowhow.cipra.org.> (Retrieved on 20 August 2009).
- Namgail T, Bhatnagar Y, Misra V, Bagchi S 2007. Pastoral nomads of the Indian Changthang: Pastoral system, land use and socio-economic changes. *Human Ecology*, 35: 497-504.
- Oberai AS, Singh HKM 1983. *Causes and Consequences of Internal Migration: A Study in the Indian Punjab*. New Delhi: Oxford University Press.
- Pathak P, Mehta D 1995. Trends, patterns and implications of rural-urban migration in India. In (UNESCAP) United Nations Economic and Social Commission for Asia and the Pacific. *Trends, Patterns and Implications of Rural-Urban Migration in India, Nepal and Thailand*. Asian Population Studies. Series No. 138. New York: United Nations, pp. 9-64.
- Peter Prince of Greece and Denmark HRH 1955. Polyandry and the kinship group. *Man*, 55(198): 179-181.
- Peter Prince of Greece and Denmark HRH 1963. *A Study of Polyandry*. The Hague: Mouton & Co. Perspectives of Systems Informatics (PSI) 2006. 6th International AndrieErshov Memorial Conference, PSI 2006. Novosibirsk, Russia, June 27-30, 2006, (Revised Paper)
- Rawat GS, Adhikari BS 2002. *Vegetation Structure and Patterns of Livestock Grazing in Tso-Kar Basin, Eastern Ladakh*. IRS-Liss with the Help of Global Positioning.
- Rizvi Janet 1999. *Trans-Himalayan Caravans: Merchant Princes and Peasant Traders in Ladakh*. New Delhi: Oxford University Press.
- Rosing, Ina 2006. *Shamnic Trance and Amnesia with the Shamans of the Cjhanggpa Nomads in Ladakh Changthang*. New Delhi: Concept Publishing Company.
- Salzman PC 1980. *When Nomads Settle*. New York: Praeger.
- Sandford S 1983. *Management of the Pastoral Development in the Third World*. New York: J. Wiley and Sons.
- Skeldon R 1990 *Population Mobility in Developing Countries: A Reinterpretation*. London, UK: Belhaven Press.
- Smutylo A 2008 Allen Smutylo's trip in 2008 to Brokpa. Allen is a Canadian artist creating paintings and prints inspired by landscapes, at his studio in Big Bay.
- Spooner B 1973. *The Cultural Ecology of Pastoral Nomads*. Massachusetts: Addison Wesley Publishing Co.
- Swift J 1977. Pastoral development in Somalia: Herding cooperatives as a strategy against desertification and famine. In: MH Glantz (Ed.): *Desertification and Environmental*, Boulder, CO: Westview Press, pp. 275-305.
- Swift J, Maliki A 1984. A Cooperative Development Experiment among Nomadic Herders in Niger. *Paper 18c*. London: Overseas Development Institute.
- Voronkov Andrei, Virbitskaite Irina (Eds.) 2006. Perspectives of Systems Informatics 6th International Andrei Ershov Memorial Conference, PSI 2006, Novosibirsk, Russia, June 27-30, 2006, Revised Papers. Conference Proceedings PSI 2006.
- Weixlbaumer N 1998. Gebietsschutz in Europa. Konzettion, Perzeption Akzeptanz; Ein Beispiel angewandter Soziogeographie am Fall des RegionalparkKonzeptsin Friaul-julish Venetien. Wein. Tnstitute fur geography. (1998) c.f. Protected Areas: Biological Diversity as an Investment. From <alpsknowhow.cipra.org.> (Retrieved on 20 August 2009).

Paper received for publication in February, 2018
Paper accepted for publication in July, 2018