CHAPTER- 2

LAND AND PEOPLE OF UTTARAKHAND

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In the Central Himalayan region lies Uttarakhand - the magnificent mountain state and the 27th state of Indian Union. This state came into existence on the 9th November 2000; earlier it was part of Uttar Pradesh. Being the abode of saints and Tapsthali of Shiv-Parvati, the
state has been known for its serenity for ages. It is an often mentioned region in the mythology. According to the *Puranas*, Uttarakhand region formed by the combination of *Kedar Khand* and *Manas Khand*.

The major part of Uttarakhand is hilly and the shape of the state is almost rectangular. It spreads from $28^\circ 53'24''$ to $31^\circ 27'50''$ N Latitude and $77^\circ 34'24''$ to $81^\circ 02'2''$ E Longitude. The state covers an area of about 53,483 sq. km.; the length and breadth being 358 km and 322 km respectively. Uttarakhand is generally known as the northern Himalayan Mountain region. *Kumaun* and *Garhwal* are two administrative regions of the state. The state consists of thirteen districts: Almora, Bageshwar, Chamoli, Champwat, Dehradun, Haridwar, Nainital, Pauri Garhwal, Pithoragarh, Rudra Prayag, Tehri Garhwal, Udham Singh Nagar and Uttarkashi.

On the north it is bounded by the China occupied Tibet, on the east by Nepal, on the west by the Indian states of Himachal Pradesh and Haryana and on the south by Uttar Pradesh. *Garhwal* and *Kumaun* are the political divisions of this region. The capital of Uttarakhand is Dehradun. *Tarai* region of the state stretches east-west to the south of Siwalik range. Most of the *tarai* region falls in the district Udham Singh Nagar. The high mountains of the Himalayan region are generally snow covered and these mountains receive heavy snowfall from November to March.
Uttarakhand is a significant part of the Central Himalayan region in terms of its valuable heritage with natural bounty. The state is famous for its age old traditional knowledge. Uttarakhand is one of the richest regions of the country from the point of view of its traditional knowledge systems and rich geo-diversity and bio-diversity. The people of this region developed indigenous systems of knowledge by trial and error, and the accumulated knowledge was passed from generation to generation through the word of mouth. (Tripathi 2006, Tripathi 1999, Sharma 1994, Bose 1972).

2.1. A SOCIO-CULTURAL CAULDRON

Till some decades back it was considered that the Uttarakhand region remained cut off from the rest of the world for centuries. But contrary to this, some important researches in the recent past have proved that the region did not remain isolated due to its natural barriers. This region has been the centre of activities of different ethnic, linguistic and cultural groups which came from different directions at different times. Aryans, Khasas, Doms, Kiratas, Kusanas, Hunnas, Bhotiyas, Gorkhas etc. tribes came into this region in the past. Khasas are considered most ethnic people of this region which came in the Central Himalayan from northern region. (Atkinson 1981:Pp. 439.) Nautiyal says, “The Khasas seem to have left their homeland in Central Asia due to some unknown economic upsurge or probably due to overgrowth of population sometime around the 2nd millennium.
Due to occurrences of Khasa this region was known as khasa Desh. (Vaishnav 1977: Pp. 21.). There was always influx of people into the region from different parts which gave rise to a composite set up of society in Uttarakhand. The movement was not one way but the people also moved to the other parts from here. The people of this region learnt a lot from the people who came here and on the basis of their own accumulated knowledge they developed their knowledge systems. This knowledge spread to the other parts due to the reverse movement of the people from here. This two-way movement of people resulted in a colourful socio-cultural mosaic in Uttarakhand. The region was always rich in flora, fauna and minerals e.g. iron and copper ores. The recent studies show that Uttarakhand contributed to the urbanisation of the Ganga valley by supplying metals; as the Ganga valley was devoid of any kind of metals due to its geological formation. The incorporation of about 700 medicinal plants from this region in the *Materia Medica* of *Ayurveda*, (Pandey, Tiwari, and Pandey 2006: Pp. 4-20). which developed in Ganga valley, *strengthens this belief that Uttarakhand was not an isolated and sleepy* region but was always buzzing with activities. The evidence shows that the region had close ties with other regions. It is also believed that Asoka, the great king of Mauryan dynasty, exported medicinal herbs, found in this region, to Greece. Besides, there are many *Munda* and *Monkhmer* words in Kumauni dialect. Because *Shilpkars* which are earlier called *Doms*, are supposed to be Kols, speakers of *Munda* dialects. (Sharma 1988, 1989, 1990, 1994a, 1994b.) All this was not possible without to and fro movement of the people.
As I am suggesting, Uttarakhand must have played a significant role in the urbanisation and development of sciences in the Ganga valley. The reason is simple: the origin of science depends upon the richness of the biodiversity and geodiversity of a region which is very rich in Uttarakhand. As we know that even today density of population in this region is very low (about 1 crore people in fifty-five thousand square km of land area). A few thousand years ago it must have been much less. But if you go to Lohaghat area, for example, there are large fields strewn over with iron slag. There are so many old workings in the area. This obviously means that they were producing iron on a much larger scale than could have been used by the local population. It is also believed that they were producing stainless steel vessels in this area which indicates an old tradition of iron technology. Trail also refers to export of iron from this region. We may not have a direct proof at this stage but the circumstantial evidence is quite strong that iron was being produced on a large scale and could have been supplied to the Ganga valley.

Even during the Indus Valley Civilization, timber was being exported to the Harrapan towns as is indicated by the presence of Deodar wood from the Harappan sites. Even Silajeet is known from the Harappan sites which could have been imported only from the hills. Only this area is very rich in high quality talc which was very popular for bead making amongst the Harappans. (Agrawal et al 2010: www.antiquity.ac.uk.).
2.1.1. Society

At different points of time people from different parts of the world came and got assimilated with the original inhabitants and created a sort of socio-cultural cauldron. The society of Uttarakhand is an outcome of a long process of migration to the Himalayan region from almost all directions, shaping its social diversity. Many known and unknown cultures and societies, such as the Kol (related to the munda ethnic group), Kirat, (Mangoloid), Khash, Shak, Dravidians, Aryans and Hun etc have made an invaluable contribution to the formation of the society. Their present representatives in this region are, the Shaukas (Bhotiya), the Vanrot or the Raji, the Tharu, the Bhuksa, the Kol or Shilpkar, the Khash and several other groups which came during medieval period. It is argued that the Kunindas (3rd -2nd century BCE) and Katyuris (6th to 8th Century CE) were the early rulers of Uttarakhand. The Khasa, the Nanda and Mauryas had also ruled over Uttarakhand before the advent of Katyuris. The Monkhmer words found in the local dialect show that the Monkhmer speaking people came to this region from south China, and these people entered the region through Himalayan corridors. It is also believed that rice technology was brought here by the same people and subsequently spread to the other parts of the world, as rice holds a high place in local rituals which shows its antiquity. (Joshi, 1990:709-26, Joshi, 1990: Pp.39, Sankrityayana 1953, 1958, and 1964.).
2.1.2. Culture

The culture of the people or community cannot be seen in isolation from the environment they subsist on, for it is the environment that shapes their mind and body, their subtle dreams and behaviour patterns, their proclivities and their aversions, and in fact all that they come to build or nurture as culture, a civilisation or a knowledge system. In a broader context, the cultural aspects of Uttarakhand bear a strong imprint of the geo-ecological setting of the various environment types of the region (Shah 2011).

D.P. Agrawal and Kharakwal in their book *The Central Himalaya* (1998) say that this region provides a mini-model for understanding the Indian civilisation processes. Through the millennia different tribes and people – Protoaustroloids, Mundas, Kiratas, Mongoloids, Indo-Aryans, Khasas, Sakas and others - have been pouring into this cultural melting pot and leaving their signatures and producing a mosaic of cultures, which got integrated in the course of time. For long years this region of Central Himalaya was considered a *cul-de-sac*. But now it is becoming clear that this region has provided a matrix for cultural interactions.

Uttarakhand is referred to as the *Dev-Bhoomi* or the land of gods. Since historical times it has prided itself as a place of *Sanskritic*
learning and the custodian of faith. The lives of the people in Uttarakhand though generally poor have always been steeped in religion and tradition. Their exposure to modern world till very recent times hovered around the verge of ignorance. Though casteism never did create much conflict in society, yet caste norms were very much in place and were stringently observed through the life processes. Through history, the natives and the people who came to inhabit the difficult terrains of Uttarakhand developed a cultural life style that was characteristic of their innocence. Everyone had to strive hard to survive in the hostile physical environment. Therefore, the culture, ‘the little tradition’ that evolved through the knowledge of the ambient environment in the absence of any centralised domineering political authority was based on belief in god, hard work, honesty, sharing, cooperation, compassion, humour and a sense of contentment. *Hurkia-Bol,* (Fig 2.1) the practice of cooperative work of the villagers on the agricultural fields of different households, one after the other, during the season of paddy cultivation in the *Someshwar Valley* or the *Chaukhutia Valley* is one good example in this regard.

In Uttarakhand, cultural areas are generally defined by river valleys, and watersheds in general represent boundaries between different areas. In a broader context, the cultural aspects of Uttarakhand bear a strong imprint of the geo-ecological setting of the various environment types of the region. Throughout the length and breadth of the area, the influences of geographic environment are reflected in the
distribution and density of population as also the variability in the types of settlement and the building material used (Shah 2011).

The Uttarakhand Himalaya, being situated centrally in the long sweep of the Himalayan range, forms a transitional zone between the hyper-humid Eastern and the rather dry to sub-humid Western Himalaya. The environment of the Himalayan region has influenced the cultural patterns of the communities living in its proximity in a unique way.

2.2. DEMOGRAPHIC SCENARIO

Uttarakhand’s area is 58,483 sq km with a population of about 1,01,16,752 (2011 census), out of which 75% per cent live in 16414 small scattered villages; 80% per cent of villages have population less than 500 persons and almost 90% per cent of villages have population of less than 1000 people; 62% per cent of the villages are not connected by any pucca road. Male Population is 51,54,178 (50.95% per cent) and Female Population, 49,62,574 (49.05% per cent). The average population density of the state is low at 189 persons per sq km and there are hardly any industries worth the name. Population density is very low in hill districts as compared to the districts in plain areas. Total literacy rate is 79.63 per cent in which 88.33 per cent males and 70.70 per cent females are literate. Throughout the length and breadth of the area, the influences of geographic environment are reflected in the distribution and density of population as also the variability in the types of settlement and the building material used. The pace of
urbanization has been very slow and with hardly 25.6 per cent of its total population being classed as urban, Uttarakhand is dominantly a rural area (Government of India: Census of India 2011).

2.3. **ENVIRONMENT**

Uttarakhand is mostly hilly, situated in the Central Himalayan region and a recently formed state of India. From the point of view of area, the region is fairly large. On the north Uttarakhand is demarcated by the river Kali and on the west by the river Tons. Many well known mountain peaks of the Great Himalayan range fall in Uttarakhand such as Kamet, Badrinath, Trishul, Dunagiri, Mana, Chaukhamba, Bandar Poonch, Panchachuli, Nandakot etc. The highest mountain peak in this region is Nanda Devi which is about 7,817 m. above the sea level. Gaumukh and Yamunotri are the main glaciers of this region which give birth to the s Bhagirathi and Yamuna respectively. Several rivers and their tributaries originate and pass through Uttarakhand; the Ganga, the Yamuna, the Ram Ganga, Kali and the Alaknanda etc are the main rivers of Uttarakhand. Uttarakhand is also known for some mountain peaks and world famous glaciers like Milam, Pindari, Kafni, Khatling etc which are situated in the greater Himalayan zone of Uttarakhand. The greater Himalayan zone serves as the barrier for monsoonal winds which cause good rainfall. This region is a massive water store for the abundance of perennial rivers, flowing southwards. So the entire region is well drained by the perennial rivers.
The Khatling glacier is associated with some famous legends and is the source of the river Bhilangana. According to a local belief, a beautiful Bhil lady tried to entice the meditating Shiva but she was spurned by Shiva and dissolved into liquid which turned into the river Bhilangana. The Milam glacier is considered one of the largest glaciers of the Himalayan region. Extensive snowfields are found in the Gori basin of this region which mainly comprises the Milam and Kalabaland glaciers. The Lasser is an important tributary of the river Dhauli, which flows parallel to the river Gori which is fed by many small glaciers.

The river Kali originates some 100 km from Dharchula in district Pithoragarh; initially, it is known as river Kali and later as Sharda; the Lasser, and the Dharma are its important tributaries. The Gori, Saryu, Lohawati, Dhauli Ganga are other tributaries of the river Kali. The Kali forms the whole eastern border of Kumuan region of Uttarakhand and separates it from Nepal. After flowing a distance of about 160 km the Gori Ganga meets it at Jauljibi. The river Saryu is also one of the major tributaries of the river Kali, and joins it at Pancheswar, about 45 km from Jauljibi, which comes from village Khaljhuni, Malla Danpur on the extreme north of Almora district.
The river Yamuna is one of the main rivers of Uttarakhand, which originates from Yamunotri glacier, some 8 km from Uttarkashi. The Tons, Asan and Giri rivers flow together with it. The Tons is the biggest tributary of the river Yamuna. Finally it merges with the Ganga at Allahabad (in Uttar Pradesh). The Pindar is also an important tributary of the river Alaknanda. It originates from the Pindari glacier. The Ramganga originates from the southern part of Kumaun. “It has wide open fertile alluvial terraces along its course between Chaukhutiya and Bhikiyasain. The Ramganga drains the entire western Kumaun (Agrawal and Kharakwal 1998: 8)”. After covering a distance of about 144 km of hilly terrain it reaches the plaina at Kalagarh.

The Central Himalayan region includes low valleys, hills with subtropical to alpine vegetation. People, in the course of cyclic migration and also in their efforts to eke out their survival from a basically unkind environment, learned a great deal about their environment. In these hills, environment is an integral part of their being. And it is replicated in the local tradition. According to a legend Nanda, the local goddess, asks the pine tree about her maika. The pine rebukes her so Nanda curses it; her curses are basically the ecological properties of pine. Next she goes to the oak tree and requests it to allow her to relax in its shade and in return Nanda showers blessings on it which are again ecological properties of an oak tree, where animals, birds and flora flourish and where there are abundance of spring wells.
Uttarakhand is extremely rich in its bio-diversity as the forests and mountains serve as the best habitat to flora and fauna. At present the increasing population, prosperity of people and other factors are threatening the ecology of this region, and consequently it is gradually losing its natural wealth. Large scale deforestation and overgrazing on the high grazing lands have led to soil erosion and other environmental problems. Construction of roads, increasing demand for fire wood, extensive tree trimming one by one to give food to domestic animals all are increasing the destruction rate of forests. The Himalayan watercourses that were once crystal clear are now getting polluted at an alarming rate because of rapid population growth. At present its ecology is suffering from lots of adverse change, the water sources have alarmingly got polluted. The hill communities who are using this water are, at the same time, suffering from typhoid, cholera, dysentery and many skin deceases. Not only water streams but also some lakes like the Naini lake (Nainital) have got polluted too.

Regional dissimilarities in ecological degradations are present in the Himalaya. If hasty development goes on in this region without due regard for protection, the problems may prove dangerous in the near future. If these changes are not stopped in time they will prove harmful for the environment. Before finding solutions to these problems we will have to understand the environment and its related parts. A human being, in his life time, is directly affected by
environment. Existence of any living being is not possible in the absence of its environment. The study of humans, animals, plants and other living beings in close relationship with their environment is known as Ecology. There are two main parts of ecology Biotic and Abiotic which are combined to form ecosystem. In any ecosystem there are continuous interactions between abiotic and biotic factors, due to which the atmosphere of a region remains in balance. These activities of energy transfer or biogeochemical cycles make the environment balanced. If there is any disturbance in these activities then environment related problems cause danger to human existence. Therefore, it is clear that to create a balance in environment, it is necessary to take care of important groups of ecosystem.

Most parts of Uttarakhand are hilly so the environment of Uttarakhand is fully dependent upon forests, as it the major element. The total forest cover is about 34,359 hectares which accounts for 63 per cent of the total area of the state. The degradation of environment in the name of so called development has become a burning problem of the state. The violation by pine tree is contributing a great deal in this respect. The need of the hour is to plant more and more broad leaves trees especially oak because banj (oak) tree has miraculous properties. Its long and expending roots strongly bind the soil lumps together to help stop soil erosion and retaining soil fertility and even can reduce frequently occurring landslides during rainy season. The oak tree also provides suitable conditions for the growth of other plant species because the land close to it remains moist. It is also useful for
making different types of tools. Plantation of broad leaves trees is not the only way out but the construction activities should also be stopped because the landscape of the state is fast being eaten away. (Bose, 1972. Saklani, 1993, Rupke, 1974, Nakata, 1972).

Uttarakhand can be divided into four physiographic parts (Fig. 2.2):

2.3.1. The Greater Himalaya

2.3.2. The Lesser Himalaya

2.3.3. Siwaliks and Doon

2.3.4. Bhabhar and Tarai zones

2.3.1. The Greater Himalaya

The extreme northern belt of the region is above the snowline and the mountains are always snow covered. Therefore this zone is also known as Himadri. The width of this zone is about 50 km. This zone is made up of rich fossiliferous sedimentary structures and is quite prominent (Agrawal and Kharakwal 1998: 7). This zone is also known as the Bhot region because it is the summer base camp of the Bhotia tribe which is an industrious tribe. “This zone consists of a magnificent series of glacier-garlanded peaks: Bandar Punch (6,315 m), Gangotri (6,614m), Kedarnath (6940 m), Chaukhamba (7,138 m),
Kamet (7,756 m), Nanda Devi (7,817 m), Dunagiri (7,066 m), Trisul (7,120 m), Nandakot (6,861 m). The topography of the Greater Himalaya (Himadri) is highly rugged and difficult with precipitous slopes. Horned peaks, serrated crests of high ridges, cirques and glaciers, snow-clad slopes, hanging valleys, cascades of sparkling water coming from the melting ice, torrential rapids, and gigantic escarpments comprise a gorgeous topography. Deep canyons, roaring streamlets, huge boulders and glistening lakes create a breath-taking scenery. The zone of perpetual snow is characterized by many high peaks with numerous mountains and valley glaciers. It is South and South west of the Trans-Himalayan zone. Here also the habitation is sparse” (Singh 2004: 447-448).

2.3.2. The Lesser Himalaya

The Lesser Himalayan belt expands between the Greater Himalaya on the north and sub-Himalaya or Siwaliks region on the south. This region covers about 50 per cent area of Uttarakhand. It is composed of crystallines, granites, gneisses and schist rocks. “In this zone of separation the Precambrian and Paleozoic, sedimentaries with granites injected metamorphics, are divisible into the succession of the three thrust sheets or Nappes: a) the Krol belt; b) Almora Dudatoli crystalline mass; c) Deoban–Tejam group (Valdiya 1979: 150-51).

This region is full of mineral resources like limestone, talc, dolomite etc. Besides, this region is also rich in metals, as many copper ore, iron ore, sulfur, lead mines have been found. Many ancient mining
and smelting sites have been discovered by D.P. Agrawal and his team through his research project in metallurgy, it clearly indicates that metallurgy was practised here on a large scale in ancient times. The region is characterized by a varied relief - consisting of deep river valleys, the ridge and mid-slope areas and the high upland zones. The average rainfall in the region varies from 1000 to 1500 mm. The climate is cold to temperate. The ecology and environment of these hills are marked by certain specificities such as fragility, inaccessibility, marginality and diversity. The area is prone to natural hazards and disasters aggravated by anthropogenic activities. These difficult and unique conditions have resulted in a symbiotic relationship between the people and their environment, which is based on the continuous observations, experiments, experiences and intimate understanding of the immediate surroundings. It is realized that the life of local people is very much tied to local environment. Environment is not something out there for these hill people but a part of their being. They depend upon the local flora and fauna to eke out their living, but it’s a symbiotic relationship. They realize that preserving the environment is a matter for their survival also. They depend upon the environment and plants not only for their livelihood, but also for their healthcare. Massive deforestation, unchecked mining and quarrying activities due mainly to the pursuit of mindless material development has caused soil erosion problems in this region of Uttarakhand, damaging watersheds and the livelihood base (Shah 2011).
2.3.3. Siwaliks and Doon

This region is located south of the Lesser Himalaya. Narrow valleys are found in between the Lesser Himalaya and the Siwaliks. There is a local belief behind the name of Siwaliks, that in ancient time 125 lakh mountains were found in this region due to which the region is known as Siwaliks but according to another belief, the word Siwaliks is formed by the combination of two words Shiva and Alak which literally mean God Shiva and eyebrows of Shiva. These ranges are separated from the main Himalayan ranges by the main boundary thrust. Lithologically, these ranges are quite different from those of the Lower Himalaya. This is the outermost and the youngest zone on the south of Lesser Himalaya. These are also the lowest ranges of the Himalaya and the altitude varies between 500 m along the deep river valleys to about 1200 m at the ridge tops (Singh 2004:449).

2.3.4. Bhabhar and Tarai Zones

The Bhabhar and Tarai region is the southernmost stretch of Uttrakhand. This spreads from east to west, on the south of Siwaliks range. This belt is about 35 km wide on the west but it becomes narrow continuously towards east. Haldwani, Ramnagar etc of district Nainital and Jaunsar Bhabar in district Dehradun fall in Bhabar whereas Udham Singh Nagar comes under Tarai.
2.4. Climate

The climate of this region is tremendously varied, largely due to variations in altitude it changes from tropical to temperate and remains harshly cold near the snowline. Moreover, the climate changes within a few kms. Since Uttarakhand is a hilly region and its major part lies in Central Himalaya, the state generally enjoys a temperate climate. In case of its two different geographical divisions, the climate of Uttarakhand is sharply distinguished: the average temperature of the larger hilly region varies from $5^0$ to $10^0$ C during the winter season, and the average temperature during summer season varies from $20^0$ to $30^0$ C. Warm temperate conditions prevail in the Middle Himalayan valleys, with summer temperatures usually hovering about the mark of $25^\circ$ C (about 77° F) and the winters are comparatively cool. On the other hand, the climate of the plains area is hot and dry; the average temperature during winter remains around $18^0-20^0$C and the summer temperature crosses, on an average, $38^0$C mark. Chilly temperate conditions dominate the higher regions of the Center Himalaya, where the summer temperatures are generally $15^0$ to $18^0$C and in winters they drop below freezing point.

At altitudes above 4880 m (16,000 feet), the temperature is harshly cold which mostly remains below freezing point. The region
experiences heavy snow fall from December to March and is perennially covered with snow and ice. The higher reaches of Nainital, Almora, Chamoli, Ranikhet, Pithoragarh, and Tehri Garhwal districts receive heavy snow-fall during winter. The climate in the northern division of Uttarakhand normally remains cold. This mountain range itself exerts an appreciable influence on monsoon and rainfall patterns. Within the Himalaya, temperature differs depending on elevation and location (Fig. 2.3).

During the rainy season (mid June – mid September), there is abundant rainfall in the region. The eastern part of the Himalaya receives heavy rainfall and the western part remains comparatively drier. The average annual rainfall in the state is 185 cm. Maximum rainfall is received by Nainital, Dehradun and Munisyari. Up to the height of 1500 m the region receives abundant rainfall and in between 1500-3000 m there occurs heavy snowfall. Out of the total rainfall 85 per cent occurs between the month of June and September and the maximum average rainfall in the state is 1079 cm.

2.5. VEGETATION AND SOILS

2.5.1. Vegetation

Its vegetation cover is about 60 percent of the total surface area. Uttarakhand is very rich in terms of flora and is replete with a tremendously wide variety of vegetation. There is significant diversity
in natural vegetation, because of its variation in geographical conditions. The diverse climatic conditions along with other features like soil quality, rainfall, temperature etc. are responsible for the variety of vegetation which grow at different altitudes. The flora of this region can be categorized into tropical, Himalayan sub-tropical and sub-alpine and alpine type. The sub-tropical region up to an altitude of 4000 ft. is the abode of Sal forests and at an altitude of about 5000 ft. pine begins to dominate along with Oak. Apricot, guava, plum and peach are the major fruit species of the state. Flowers like sunflower, geraniums, asters, lilies, roses, anemones, marigold, primula, gerberas, dahlias, hydrangeas, gladiolas are commonly found in this region. *Brahma kamal*, aconites, *buras*, poppy, *roji*, pastoris, *ligujeriya*, *Thimus lainearus*, *jaisiyana* etc are some other flower plants which are abundantly found in the *Valley of flowers* in district Chamoli. This region also has 225 species of ornamental plants which have immense horticultural and potential importance. Acrides, coelogyne, thunia, dendrobium etc are some examples of ornamental plants which are found at places like Mandai, Baram, Dafia Dhoora, Kaflani, Shandev etc. An amazing range of medicinal plants and herbs also grow in the state. Ranikhet area is replete with approximately 4000 species of medicinal plants.

There are thick forests of pines, deodars, rhododendrons and birches in this region which are valuable and mostly their wood is used for making window and door frames and beautiful carving is done on them. Uttarakhand has thick forests near Jangle-chatti below
Tungnath and dense birch forests on top of Gangotri, the Arau valley and many other places (Bose 1972: 61). Chir pine or Pinus roxburghi is found from the height of 1,200 to 2,200 m, which is the most common conifer of Uttarakhand region. Besides timber, pine yields resin from which turpentine oil is obtained. Some shrubbery types of this region are: Ghingharu, Jhatalu, Hinsalu, Kilmori. This area also has moist mixed deciduous forest and sub-alpine grazing land in abundance.

This region is replete with diverse flora and fauna because of the complex topography e.g. high mountains and valleys. The slopes of the mountains are covered by immense grasslands, which are called bugylas (alpine pastures) in Uttarakhand. Bugyals are well known for rich and diversified vegetation. These grasslands or Bugyal are found between tree line and snow line that is between altitudes 4,000 and 5000 m. These Bugyals are flat and sloppy lands carpeted with green grass and seasonal flowers, which is very nutritious fodder for goats, sheep, cattle and other animals. These grasslands were covered with birch and juniper in the past but now they have been cleared to serve many purposes. Dol, Hatthajari, Bal chari, Kutaki, Jatamansi etc are some other common plants, which are used for curing many incurable disease. The World famous Auli and Gorson Bugyals are near Joshimath, at an altitude of about 3049 m. Besides, Bedni Bugyal, Dayara Bugyal in Uttarkashi district and Panwali and Kush-Kalyani Bugyals lying on the way to Gangotri and Kedarnath, Rup Kund Ka Bugyal is another famous Bugyal. Dayara Bugyal is in Uttarkashi
district and *Bedni Bugyal* is near mundoli and it is at a height of 3,354 m. *Panwali* and *Kush- Kalyani Bugyals* are on the way to Gangotri and Kedarnath. *Chopta Bugyal* (on the way to Ukhimath Gopewhwer), *Jaurai Bugyal* (on the way of sahastra tal), *Masartal and Sahastra tal ke Bugyal* (near Budha kedar), *Kotaali ki hari Bugyal, Kalpnath Bugyal* (on the way to Badrinath), *Chayagaad Bugyal* (in Uttarkashi district). *Har ka dun Bugyal* is one of the most beautiful Bugyals of Garahwl (in Uttarkashi district), *Dayara Bugyal* (in Uttarkashi), *Auli- gurso ka Bugyal* (about 5.0 km. from Joshimatah), *Kathling ka Bugyal* (after Gangi village) and *Rup kund ka Bugyal* (on the way to Rishikash) etc are some other Bugyals of this region. (Badoni & Badoni, 2001: Pp. 127-147. Melkenia and Tondon in Chadha 1988: Pp. 137-167.)

2.5.2. Soil

The soil of this state is known as mountainous forest soil which. The thin cover of soil commonly occurs on the temperate dip-hills; on the other hand the southern slopes contain colluvial deposits. Therefore the northern hills support forests, while the southern faces are generally naked. Generally five main types of soil are found in this region: Quartzite soil; Volcanic soil; Brown soil; Alluvial soil; and Tertiary soil.

Quartzite soil is generally found in Nainital district. This soil is light and infertile, which contains cysts and quartz. Volcanic soil is very
fertile and suitable for the agriculture, which is found in the hilly tract with igneous rocks. It is sandy and light and contains sizable amount of dolomite and granite. Brown or grey soil is found in Nainital, Mussoorie and Chakrata. It has high percentage of lime. The high altitude areas have a brown soil cover which is rich in humus. The Alpine zone, extending above 3000 m, has a soil of glacial origin with granitic sandy loam. Alluvial soil is also suitable for agriculture; it is fertile and found in the valleys which have colluvial and alluvial deposits. This type of soil is also found in lower slopes of Siwaliks range, Doon valley and Tarai and Bhabhar region. Tertiary type of soil is commonly found in the Siwaliks Mountains as well as the Doon Valley. The soil is very light, porous and contains sand. It is replete with iron-oxide, biological remains and humus. It is suitable for the cultivation of tea. (Agrawal & Kharakwal 1998: Pp.7, Bose 1972: Pp. 56-57, Joshi 2004: Pp. 76-83.).

2.6. FORESTS

Uttarakhand is one of the densest forest areas of India because it is extremely rich in natural resources and a rich biodiversity. Forests have been an integral part of cultural, social and economic life of Uttarakhand. Uttarakhand mainly consists of a hilly terrain except the tarai and bhabar areas. Most of this region is covered with forests. About 35, 399 sq km. area that is 5.2 million hectares (about two-third of the geographical area) of this state is under forest cover, out of which 23000 sq km is under the control of the forest department. At
present, the government of Uttarakhand earns revenue of Rs 100 crores per annum from the forests. Chamoli and Pithoragarh districts have comparatively less forest cover because sizable parts of these districts remain snow covered all round the year.

The forest area constitutes 44 per cent of the total geographical area. According to the forest policy of 1952, there must be at least 33 per cent area under the forest department, so in Uttarakhand it is well above the set limit. Forests play a significant role in the economy of the state. Forests are the main sources of the raw material for industries, buildings and other tertiary sectors. The new state of Uttarakhand has good potential for the development of forest resources. Peoples who live in remote villages or far flung areas depend completely upon forests for meeting their day to day needs, like timber, fuel, fodder for animals, drugs etc. The First Forest Research Institute of the country was founded at Dehradun in 1914; a forest ranger college was established in Dehradun and forest rangers were trained there. At that time the income of the state was around Rs.600 crore from the forest resources. Most of the hilly area of this region is covered with thick forests with pine (chir), spruce, mainly oak, rhododendron, deodar, sal, teak, khair, behara, haldu, semal, shisham at different altitudes.

Forest of Birch and Rhododendron are mostly found below the snowline. These are succeeded downhill by forests of silver fir,
spruce, *deodar*, *oaks* and *chir* (pine). On the foothills, in *Bhabbar* and *Tarai*, the valuable *sal* forests are found.


Geographically, the forests in Uttarakhand can be classified into four categories:

2.6.1. *Himadri Forest*

These forests are found at the height of about 3000 to 3800 m and are dominated by little shrubs and rhododendron. These forests are mostly found in Tehri Garhwal, Dehradun and Almora districts.

2.6.2. *Tropical Pine Forests*

These forests are found at the height of about 1000 to 1800 m and are known as tropical-pine forests. These are evergreen forests and are found in the lower Himalayan region, in between the moist semi-temperate forests and tropical moist deciduous forests. Pine is the dominating species of this zone. Extensive presence of pine forests is quite evident in Ranikhet and Almora. The temperate forests are generally found between 1,050 and 1,900 m on the southern slopes and between 900 and 1,800 m on northern slopes.
2.6.3. Himalayan Moist Semi-temperate Forests

These forests are found at the height of about 1600 to 2900 m. These are evergreen and have needle shaped leaves. Deodar is the main species which is called gold wood because of its durability, strength and long life span. Other trees are blue pine, silver fir, bamboo, birch, *chinar*, maple. Rhododendrons are the most commonly found species in this region.

2.6.4. Tropical Forests

These are mixed forests and are found below the height of 1000 m. Commercially these forests are very important and are of deciduous type. *Sal, shisham, haldu, khair, teak, mahogany*, mulberry are the main species.

### Table 2.1

Total District wise Forest Area of Uttarakhand (From Internet)

<table>
<thead>
<tr>
<th>District</th>
<th>Geographical Area (GA) (sq)</th>
<th>Very Dense Forests (sq)</th>
<th>Mod. Dense Forests</th>
<th>Open Forests (sq)</th>
<th>Percentage of G.A.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>District</td>
<td>km)</td>
<td>sq km)</td>
<td>(sq km)</td>
<td>km)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>-------</td>
<td>--------</td>
<td>---------</td>
<td>-----</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Almora</td>
<td>3,139</td>
<td>168</td>
<td>969</td>
<td>440</td>
<td>50.24</td>
<td></td>
</tr>
<tr>
<td>Bageshwar</td>
<td>2,246</td>
<td>159</td>
<td>875</td>
<td>346</td>
<td>61.44</td>
<td></td>
</tr>
<tr>
<td>Chamoli</td>
<td>8,030</td>
<td>406</td>
<td>1,558</td>
<td>734</td>
<td>33.60</td>
<td></td>
</tr>
<tr>
<td>Champawat</td>
<td>1,766</td>
<td>327</td>
<td>605</td>
<td>230</td>
<td>65.80</td>
<td></td>
</tr>
<tr>
<td>Dehradun</td>
<td>3,088</td>
<td>487</td>
<td>664</td>
<td>442</td>
<td>51.59</td>
<td></td>
</tr>
<tr>
<td>Pauri</td>
<td>5,329</td>
<td>450</td>
<td>2,065</td>
<td>756</td>
<td>61.38</td>
<td></td>
</tr>
<tr>
<td>Haridwar</td>
<td>2,360</td>
<td>29</td>
<td>327</td>
<td>274</td>
<td>26.69</td>
<td></td>
</tr>
<tr>
<td>Nainital</td>
<td>4,251</td>
<td>548</td>
<td>1,436</td>
<td>604</td>
<td>72.64</td>
<td></td>
</tr>
<tr>
<td>Pithoragarh</td>
<td>4,251</td>
<td>548</td>
<td>1,436</td>
<td>604</td>
<td>29.29</td>
<td></td>
</tr>
<tr>
<td>Rudraprayg</td>
<td>1,984</td>
<td>179</td>
<td>605</td>
<td>336</td>
<td>56.45</td>
<td></td>
</tr>
<tr>
<td>Tehri</td>
<td>3,642</td>
<td>227</td>
<td>1,255</td>
<td>656</td>
<td>58.70</td>
<td></td>
</tr>
<tr>
<td>U.S. Nagar</td>
<td>2,542</td>
<td>144</td>
<td>246</td>
<td>174</td>
<td>22.19</td>
<td></td>
</tr>
<tr>
<td>Uttarkashi</td>
<td>8,016</td>
<td>408</td>
<td>2,062</td>
<td>674</td>
<td>39.22</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>53,483</strong></td>
<td><strong>4,002</strong></td>
<td><strong>14,396</strong></td>
<td><strong>6,044</strong></td>
<td><strong>45.78</strong></td>
<td></td>
</tr>
</tbody>
</table>

Forests are useful in having a check on floods, as rain water runoff is reduced and less water goes to the rivers, prevent land degradation,
and also help maintain natural landscape of the area. Roots of trees tightly bind soil particles together and thus forest cover has a check on soil erosion. Forests also provide raw materials to a large number of industries. Our existence is fully dependent upon forests because many medicinal plants which are effective in curing diseases are provided by forests. Besides, timber, fuel and many other valuable things are provided by forests to us which sustain us.

In the past, some massive movements were organised by the people of Uttarakhand especially in Garhwal region to save forests. The world famous *Chipko Movement* was started at Gopeshwar in 1973 by a 23 year old widow Gaura Devi to stop the reckless and illegal exploitation of forests in Uttarakhand (Guha, Ramachandra. 1989: Pp. 152-179). The women of the region stood united against the government contract for felling trees, they hugged trees to save them from felling. They spent long hours walking from village to village, gathering support for the movement. A slogan was given by the revolutionary women in 1977:

*Kya Hain is Jangle ke upkar, Mitti, pani aur bayar,*

*Mitti pani aur bayar, jinda rahne ke aadhar*

It means ‘the blessings of the forest are soil, water and pure air which are the basic elements for life on the earth. The environmentalists Sunder Lal Bahuguna and Chandi Prasad Bhatt played key roles to
make the movement successful. Chandi Prasad Bhatt was given Magsasay Award for his key role in the movement.

*Maitri movement* was started by the women of Garhwal region to spread awareness about environment. This movement was led by Mr Kalyan Singh Rawat. Simultaneously, under the banner of this movement a large scale aforestation drive was also started. The whole movement was meant to save the deteriorating environment.

In order to connect people with forests, the plan *Apna Gaun Apni Van Yojana* was started by the government of Uttarakhand some time back. Initially, violation of forest rules was checked in Haldwani, Udham Singh Nagar and Haridwar. Subsequently, tree plantation was started for the development of forests on the barren stretches. *Rambans* and *ringal* species were abundantly planted to turn them into habitat for the animals. *Chir* (pine), oak, *sal*, *sagaun*, *tun*, etc plant species were also planted and *kachnar*, *kharig*, *bhimal*, *biton* like species were planted to meet fodder requirement of animals. Besides, some valuable medicinal plants and wild fruit plants were also planted.

*Pani Rakho Movement* was started by the youths of Ufraikhal village in Pauri Garhwal district of Uttarakhand some 23 years ago. As a result of this movement, the barren land of this region has now
completely turned fertile. Because of the afforestation drive the barren land has now turned into dense forests. About 15 lakh saplings were planted here; because of this the area is now replete with natural resources and water is available all round the year. The saplings were planted by the people of all the age groups. Mahila Mangal Dal also played a key role in maintaining the ecosystem of this region.

Although sizable portion of forest cover is present in Uttarakhand and serious efforts have been made by some people to save it but still large scale deforestation is going on. People living near forests are dependent on them for firewood and fodder for their animals. They lack awareness, instead of collecting leaves they cut the whole branch causing a big loss to the environment. Community participation can be increased by making them aware of the degrading environment and its impact. They should be made aware of usefulness of different types of plants. Oak tree plantation should be encouraged because the oak tree raises water level and provides plenty of fodder for animals. Besides, it is useful for humans due to its commercial value as oak is used as timber for building, construction and agricultural implements too. Along with this the fuel which we get from this tree is of high quality. So in order to save the forests we it should be covered with broad leaves trees and banj (Oak) should be preferred.

2.7. CONCLUSION
The chapter aims at giving a general view of the present Uttarakhand in the context of the past, as to understand the past it is necessary to have a look at the present. The ambient environment, climate and ecology have a determining effect on the people and their culture and history. The next chapter will shed light on ‘how the past circumstances in Uttarakhand e.g. to and fro movement of people, geo-diversity and bio-diversity’ led to the genesis of its own knowledge systems.

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