

**A STUDY OF NON-LITERATE TRADITIONAL KNOWLEDGE
SYSTEM OF UTTARAKHAND**

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ABSTRACT:

Till a few decades back, Uttarakhand was supposed to be an isolated region from rest of the world due to its geographical constraints. But now it has become clear through some recent researches that this notion was wrong. On the contrary, this region was always in give and take relationship with other regions. It contributed a great deal to the urbanisation of the Ganga valley which took place during the 1st millennium BCE. The Ganga Valley availed the traditional technologies of Uttarakhand which were developed by the primitive people of the region over centuries in the course of their trial and error experimentation. Knowledge of metallurgy was one such area which was quite developed in Uttarakhand because iron and copper ore reserves were available in plenty. The urbanisation of the Ganga Valley was based on metals especially on iron but it was not amply available in the valley because there are no mineral occurrences in the alluvium of the doab, whereas there are evidence of copper smelting belonging to the 2nd millennium BCE from Pithoragarh and iron smelting near Dwarahat dating back to 1000 BCE. These circumstantial evidences strongly prove the relationship between the Ganga Valley and Uttarakhand based on supply and demand of metals. The early people of this region were totally dependent upon nature not only for their basic needs but also for many other things. The people learnt about various herbs and plants not only for food supplements but also for medicinal purposes. They had knowledge about the hardness and brittleness of various stones which were used by them for making tools, for hunting. Quite sophisticated technologies were developed by early people of this region through millennia of experience and trial and error experimentation. These traditional technologies not only reflect the religio- aesthetic aspiration of early people but also indicate their relationship with the environment to eke out their living. They lived in harmony with the nature.

KEYWORDS: Uttarakhand, geographical constraints, technologies, people, Knowledge, nature, relationship, environment.

INTRODUCTION:

The knowledge of early people of this region was not documented, but was stored in their memory and passed from generation to generation through the word of mouth and legends. Their knowledge about architecture, medicine, metallurgy and hydraulics was based on empirical observations and trial and error experiments. In ancient times, Uttarakhand was extremely rich in natural resources like minerals, medicinal plants, water, wood etc. In quest of taking these resources to their advantage for survival, humans consistently experimented with these. And over centuries he accumulated a lot of knowledge through learning by consistent trials.

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° 53' 24" to 31° 27' 50" N Latitude and 77° 34' 24" to 81° 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.

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 BC.” (Nautiyal and Khanduri 1986: Pp. 78.) 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.

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.

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.

DEMOGRAPHIC SCENARIO

Uttarakhand area is 58,483 sq km with a population of about 1,01,16,752 (2011 census), out of which 75per cent live in 16414 small scattered villages; 80per cent of villages have population less than 500 persons and almost 90per cent of villages have population of less than 1000 people; 62per cent of the villages are not connected by any pucca road. Male Population is 51, 54,178 (50.95per cent) and Female Population, 49, 62,574 (49.05per 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 88.33per 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).

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.

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 diseases. 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 extending 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.

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 (7,817m), 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. 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.

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.

4. Bhabhar and Tarai Zones: The Bhabhar and Tarai region is the southernmost stretch of Uttarakhand. 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 Bhabhar whereas Udham Singh Nagar comes under Tarai.

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^o to 10^o C during the winter season, and the average temperature during summer season varies from 20^o to 30^o C. Warm temperate conditions prevail in the Middle Himalayan valleys, with summer temperatures usually hovering about the mark of 25^o C (about 77^o 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^o -20^oC and the summer temperature crosses, on an average, 38^oC mark. Chilly temperate conditions dominate the higher regions of the Center Himalaya, where the summer temperatures are generally 15^o to 18^oC and in winters they drop below freezing point. 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.

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 Munsyari. 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.

VEGETATION AND SOILS

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 sun flower, 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.

his 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 bugyals (alpine pastures) in Uttarakhand. Buggyals are well known for rich and diversified vegetation. These grasslands or Buggyal are found between tree line and snow line that is between altitudes 4,000 and 5000 m. These Buggyals 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 Buggyals are near Joshimath, at an altitude of about 3049 m. Besides, Bedni Buggyal, Dayara Buggyal in Uttarkashi district and Panwali and Kush-Kalyani Buggyals lying on the way to Gangotri and Kedarnath, Rup Kund Ka Buggyal is another famous Buggyal. Dayara Buggyal is in Uttarkashi district and Bedni Buggyal is near mundoli and it is at a height of 3,354 m. Panwali and Kush- Kalyani Buggyals are on the way to Gangotri and Kedarnath. Chopta Buggyal (on the way to Ukhimath Gopewhwer), Jaurai Buggyal (on the way of sahastra tal), Masartal and Sahastra tal ke Buggyal (near Budha kedar), Kotaali ki hari Buggyal, Kalpnath Buggyal (on the way to Badrinath), Chayagaad Buggyal (in Uttarkashi district). Har ka dun Buggyal is one of the most beautiful Buggyals of Garahwl (in Uttarkashi district), Dayara Buggyal (in Uttarkashi), Auligurso ka Buggyal (about 5.0 km. from Joshimatah), Kathling ka Buggyal (after Gangi village) and Rup kund ka Buggyal (on the way to Rishikash) etc are some other Buggyals of this region. (Badoni & Badoni, 2001:Pp. 127-147.Melkenia and Tondon in Chadha 1988: Pp. 137-167.)

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.).

CONCLUSION

After a detailed multi-pronged study I have reached the conclusion that Uttarakhand region was not a cul-de-sac but contrary to the received wisdom, it served as a cauldron for the multiple cultural streams from other regions. This region assimilated people and knowledge from other regions and in return disseminated its own technology and culture, evolved through observation, trial and error experimentation over centuries, to the other regions. The geographical barriers give a false impression of the region as totally isolated from the rest of the world. In fact, during the prehistoric and historic periods there was a constant influx of various tribes and people into this region who also brought with them their own culture and technologies. In fact, the Kumauni dialect has a mixture of Arabic, Persian and even Monkhmer words. Uttarakhand constantly interacted with the Ganga Valley and there was an extensive exchange between Uttarakhand and the Ganga valley in terms of metallurgy, medicine, and hydraulics and thus the traditional knowledge of Uttarakhand did contribute to the process of urbanization, in the first millennium BCE, the Ganga valley went through. This exchange of knowledge and technology between two regions was further facilitated by trade, trade routes and pilgrimage centers located in this region

because there was a constant flow of people, their cultures and knowledge from and to this area. The relationship was purely based on give and take. The extensive archaeological remains indicate that metal industry was not only very ancient here but also quite prolific and probably catered to the large scale requirement of the Ganga valley, which was devoid of metals due to its geological situation. Whereas, Uttarakhand, especially Kumaun region, was rich in minerals - iron and copper ores - and it was the nearest source of metals for the Ganga valley because without metals the urbanisation was not possible at all.

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