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Economic Activities And Their Impacts On The Environment Of Khaplu, Gilgit-Baltistan

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ABSTARCT

This research focuses on the correlation between human beings, their economic activities and their natural environment in the Gilgit-Baltistan region of Pakistan. It provides an examination of how individuals have coped with and exploited their natural environment. The degree to which a society's culture is determined or influenced by their surroundings is a query that originated in the late 19th century. The emergence of environmental determinism coincided with the recognition of the environment as a pivotal influence on the development of human civilization. The significance of educators' contributions to the development of human culture was diminished starting in the latter portion of the first 25% of the twentieth century. According to their ideology, individuals' behaviors are constrained by the condition of the earth. The notion of environmental possibility arose as a consequence of this. The objective of this study is to ascertain the extent to which the local environment in a secluded mountainous area of Pakistan has shaped cultural practices, as well as the degree to which these trends have been influenced by human factors.

Keywords: *Khaplu, Economic activities, Nature, Environment, Humans.*

INTRODUCTION

Khaplu possesses a wide range of natural resources. The region possesses three fundamental resources: land, water, and natural vegetation, which enc[1]ompass woods, rangelands, and pastures. These resources hold significant value in the region. The primary economic activities in the valley are predominantly centered around agriculture and livestock husbandry. Agriculture encompasses the cultivation of both field crops and horticulture. Over time, non-agricultural activities in and out the valley, such as cities in the plains, have gained importance and now provide a considerable contribution to the local economy(Ali & Mahmud, 2023).

Agriculture:

Agriculture and the rearing of domesticated animals serve as crucial sources of income for the majority of individuals who possess tiny plots of land. Typically, both males and females engage in agricultural chores. Villagers cultivate wheat as a primary crop, and they also produce millet, buckwheat, or maize as a secondary crop for fodder purposes. The fruits cultivated in the valley also serve as a significant source of revenue for the local inhabitants. Potatoes have a significant role in the production of marketable goods. Animals are closely

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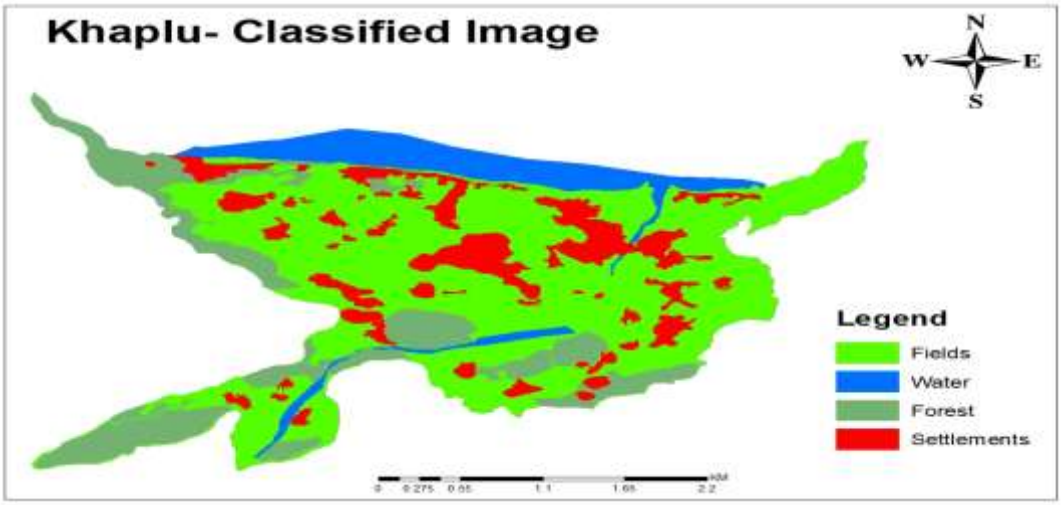
associated with farming as they provide valuable manure for the crops and are a source of dairy products, meat, fur, and skin(Giller et al., 2021).The natural environment, including climate, topography, water, and soil, all play crucial roles in agricultural activities. The lower half of Khaplu exhibits various forms of agriculture as a result of the variations in the natural environment. The higher regions are referred to as "broq," while the lower regions are known as "yul." In the yul areas, the land is primarily used for agricultural purposes, specifically for cultivating crops. The duration of the yul season varies between 5 February and 25 March, depending on the presence of water and the temperature of the soil. The sowing process in the lower sections of Yul begins earlier because to the early increase in temperature. However, in the upper portions of Yul, sowing is delayed since the temperature remains low at higher altitudes until late March. The upper section of the valley known as "broq" is characterised by its rough topography and limited availability of flat area. It experiences a brief growth period. Over time, there is a shift in the geographical area from lowland to highland due to many factors. The lowlands are seeing a growing population, which is leading to an increased demand for land for the construction of buildings and other physical infrastructure such as roads(Abbas et al., 2021). As a result, the space that was formerly used for cultivation is being converted into developed areas. In the lowlands, fruit tree cultivation has become more prevalent than crop farming due to its time efficiency in harvesting and higher income potential. Furthermore, as a result of the extensive cultivation of fruit trees, a bigger area is covered by the shade of these trees. Consequently, the yield from the cultivated area that is shaded is decreased. As a result, the upper parts of the valley are being used for cropping instead. The upper region also benefits from the increased water supply resulting from glacial melting. In the past, the lack of roads made communication between the upper and lower sections of the region challenging. However, the development of link roads has facilitated the transportation of goods from the lower areas to the upper areas, as well as the movement of agricultural products from the upper areas to the market and the main road leading to Skardu in the lower area.

In recent times, the rapid growth of population and urban development has led to the conversion of agricultural land into built-up areas, such as buildings and infrastructure. Consequently, agricultural activities are now shifting towards highland areas, specifically in broq.

Classified Map of Khaplu:



Fields are located adjacent to water bodies or along water canals where water is easily accessible. The forest area is diminishing as a result of agricultural activity. The soil in Khaplu is composed of black cotton soil, which is highly fertile. As a result, inhabitants in the area

cultivate grass (bursay) for livestock due to the abundance of water. Bursay grass serves as the primary food source for animals during the winter season. Additionally, it is exported to neighboring regions, generating a significant income. Highland is renowned for its growing of grass. Human habitations are located adjacent to the agricultural areas.

Land-Use

Khaplu is primarily characterised by subsistence agriculture, fruit cultivation, and livestock husbandry.

Agricultural Practices:

Farms are partitioned into small plots, and irrigation water is inundated in the fields. Fields are meticulously graded to minimize water wastage and prevent erosion. Chemical fertilizer remains uncommon, with the prevalent practice of use animal dung to augment soil fertility. There is a lack of sewage system, resulting in the utilization of human waste as fertilizer for fruit trees and farming areas. The primary factor contributing to the limited usage of chemical fertilizer in the valley is its high cost, which is mostly due to the considerable distance it must travel from the market(Hira et al., 2023).

Ploughing and Harvesting System:

Two "Zhos" are fastened together to tow the wooden plough. Traditionally, it is customary to gather all relatives and friends to assist in the act of ploughing, known as "Rokh". The ploughing season typically spans approximately two weeks and entails a communal endeavor in which all members of the community assist one another. Another technique for soil preparation is known as "Kang Loq," in which smaller fields are ploughed using shovels. Tractors are seldom employed for ploughing in the valley due to the presence of smaller graduated terraces. Utilizing traditional ploughing methods remains cost-effective due to the ample availability of draught animals in the region(Shrestha et al., 2020).

Traditional Ploughing Method.

Harvesting is a communal activity in which individuals from a village or extended family get together to gather the crops. The crops are subsequently dried before being subjected to thrashing. The conventional method of segregating grains from straw is referred to as "Khew". Seven "Zhos" are tethered together using a rope and a yoke around their necks, which are then fastened to the central pole. The flock is compelled to engage in continual movement around the pole, resulting in the destruction of the dried crops. Subsequently, the entire pulverized

harvest is tossed into the air, causing the grains to descend while the straw is carried a short distance by the wind. Cooperative planting, thinning, and harvesting in a region with a brief growing season, when fields must be quickly prepared for the subsequent half crop. This is a response to the environmental challenges present in the mountainous terrain.

Management of Irrigation Systems and Water Resources:

The Khaplu valley exemplifies the practice of graded terrace farming in a mountainous landscape. Typically, the size of these fields varies from 100 square yards to 1000 square yards, however the majority fall within the range of 400 to 600 square yards. The little streams, known as "Herka," are interconnected within a well-organized network, which in turn connects to the bigger streams named "Herkong." Every field is safeguarded by a retaining wall constructed from dry stone masonry. The entire valley relies on the Ghanche Nullah and Khaplu Bala spring for irrigation. The majority of the valley is interconnected with narrow streams that provide sufficient water to facilitate irrigation of the farms. The main tributaries in Khaplu Bala are two streams called "Gab Yur" (Lower Channel) and "Gong Yur" (Upper Channel), which start from the Khaplu Bala spring. In Khaplu, the primary sources of water are the "Chocho Bi" channel, which originates from the Khaplu Bala Spring, and three more channels named "Yur Herkong," "Nangyur," and "Feur," which come from the Ghanche Nullah. The flow rate of water from Ghanche Nullah ranges from 10 cubic feet per second in winter to 2500 cubic feet per second in summer. Additional water sources in the valley consist of "Morghoto Chumik" with a discharge rate of around 6 cusecs, "Ghorghoto Chumik" with 2 cusecs, and "Muldumar Rangna Chumik" with a consistent flow of 6 cusecs throughout the year(S. Ahmad et al., 2023).

Animal Feed:

Wheat and maize, which are cereal crops, are farmed three times in order to maximise the output of animal feed. Although certain farmers engage in the cultivation of fodder, the primary means of obtaining winter nutritional sustenance is through grazing on crop remnants and stubble. Despite their limited nutritional value and digestibility, trees can nevertheless be used as a supplementary source of feed. Leaves are predominantly gathered in April and October specifically for sheep and goats. Autumn and winter offer the opportunity to obtain fallen leaves from fruit plants. Strategically, trees are planted along the edges of fields and on infertile regions that are unsuitable for cultivating crops(Ranum et al., 2014). These trees provide supplementary food during the winter, as their leaves and bark can be utilized to feed animals. In Khaplu, the desiccated foliage is collected and preserved for consumption during the winter season. In order to optimize the process of gathering, cattle are restricted within their individual enclosures and are prohibited from grazing outside the assigned territory. The organizer declares the day for gathering leaves, which is universally agreed upon and approved, as not all trees in Khaplu are located inside the confines of homes. These activities arise as a result of environmental challenges. By gathering these leaves in autumn, they can augment the winter supply of animal fodder and consequently boost the number of animals they bring to the high pasture during summer.

Maize dried for winter

Fruit trees:

Fruits such as grapes, apples, cherries, apricots, peaches, pears, plums, mulberries, almonds, and walnuts are extensively cultivated in Khaplu. These fruits are primarily consumed fresh at home, with any excess either dried (such as apricots) or wasted. Apricots ripen in mid-July, and people in Khaplu preserve them for winter by drying them after meeting their immediate consumption needs. Each household typically has around 25 apricot trees. Harvesting apricots is a challenging task, as one person shakes the tree branches while another person picks them from the ground and transports them using a "chorong" (a special type of basket). From mid-July to August, the people of Khaplu are occupied with collecting apricots from the trees and drying them at home. They then sell the dried apricots in the Skardu market at a reasonable price.Walnut trees are not only considered fruit trees, but also symbols of family self-sufficiency and pride. This is due to their exceptionally long lifespan, often exceeding 400 years, which represents a living family heritage. There are various types of walnut trees, one of the most famous being the "kaghazi" variety. These trees have easily breakable shells and are abundant in nuts(Baig, A., Ali, G., & Raza, 2022). Additionally, walnut trees produce a greater amount of oil compared to other fruits. Harvesting walnuts from these

Khaplu Broq:

Broq in Balti is a commonly used phrase to describe a distant area apart from the mainland that is used for the purpose of grazing animals. Broq is a term that serves as the opposite of "Yul," denoting a settlement or community. In Broq, the period for cultivation begins in April and concludes with the harvesting season in October. Typically, the residents of Khaplu cultivate potato, buckwheat, and barley in their fields. Bursay, a type of forage, is cultivated and thereafter carried to yul as it serves as the primary source of animal feed throughout the winter season. Livestock grazing in Broq throughout the summer is a significant endeavour that spans across most of Baltistan. Cattle grazing is the main activity in most areas of Baltistan, with Broq being predominantly limited to this purpose. The production of crops in Yul is transferring to higher areas (Broq) due to the pressure of population and increasing demand for land. Historically, broq was primarily employed for the purpose of summer livestock grazing. It Nevertheless, Khaplu stands out as the sole valley in Broq that possesses extensive tracts of arable soil, suitable for cultivating a diverse range of crops such as wheat, buckwheat, barley, and grass for animals known as "Bugsuk". Khaplu Broq is divided into two distinct sections

known as "Hanjor," covering an area of approximately 4.5 square kilometers, and "Kaldaq," covering an area of approximately 1.5 square kilometers. The land mass located to the south of Khaplu is referred to as "Hanjor," while the smaller land mass situated to the east of it, which provides a view of the "Shyok River," is known as "Kaldaq." The irrigation of both areas is facilitated by three lakes, namely "Mickmaid," "Daholi," and "Rhokloon sho," which are connected to feeder waterways called "Loonphocho," "Leri," "Singay Zgang," and "Kaldaq Herkong."The entirety of the land in Broq is owned by the citizens of Khaplu, with no individuals permanently residing in Broq itself. The temporary residents throughout the working season possess a temporary abode, including of a room furnished with chimneys. In Balti, the term "Brangsa" is frequently employed to denote transient lodgings or makeshift shelters.

Livestock:

Each residence in Khaplu is equipped with a "Taghra," which serves as a designated area for housing cattle. Typically, each household keeps a small number of goats or sheep, as well as a cow, to fulfil their dairy requirements. Almost every house in the entire valley possesses cattle. Additionally, there is a customary practise in Khaplu valley to relocate livestock to Khaplu Broq during the summer months. An someone named "Norzipa" gathers all the goats, sheep, and cattle from each household and transports them to Broq for summer grazing. The "Norzipa" breed yields around 3 kilogrammes of butter per cow to the owner at the conclusion of the season. The shepherds are entitled to the remaining earnings from these flocks. Typically, affluent families possess a "Zho" individually, while others divide a single "Zho" among two or three families. The term "Zho" refers to the practise of cultivating land and then using it to separate wheat and barley grains from straw through threshing. In addition to "Zho," a significant number of households in Khaplu also possess a "Zhomo," which is the female counterpart of the zho. The milk produced by the Zhomo is notably dense and well-suited for the production of butter or ghee. Due to the prevalence of cows and goats in every household, there are no dedicated delivery points or milk shops selling fresh milk in the valley. Nevertheless, one can procure fresh butter from the market. Additionally, farmers rear cattle (Bos taurus), yak (Bos grunniens), and numerous hybrids resulting from the crossbreeding of cow and yak. Yaks play a vital role in the local economy by supplying farmers with milk, wool, labour, and manure. The yak is highly adapted to thrive in high-altitude environments. Their dense wool and other thermoregulatory capabilities let them to survive in harsh weather conditions. The practise of cross-breeding between yak and local cattle is widespread.

Zo/Zomo, or cross-breed animals, are highly esteemed creatures(Baig, A., Ali, G., & Raza, 2022).

The concept of demand and supply:

Currently, there is a higher demand for fruit trees compared to field crops due to the higher profitability of fruits in comparison to vegetables and other crops. Dried fruits may be easily transported to the markets in rural areas of Pakistan. By engaging in the sale of dried fruits, one can acquire a substantial income. Consequently, individuals prioritize the cultivation of fruit trees while neglecting the cultivation of vegetables and other field crops that are readily accessible in the local market(K. Ahmad et al., 2021).

Localized tactics tailored to fulfil the requirements of food consumption:

Because of its limited growing season, Khaplu is primarily a region where only one crop is cultivated, or at most one and a half crops (with the second crop being harvested prematurely as fodder). Consequently, the residents must preserve and store grains and other food items to sustain themselves during the extended winter season and until the next crop is harvested. In order to address this environmental difficulty, individuals in Khaplu employ various techniques to fulfil the food requirements during periods when crops are not readily available.The majority of the population of Baltistan primarily relies on their own agricultural output. While their production may not fully meet their own demands, it does make up a significant portion of their food requirements. Due to the limited capability for food production. The residents of Khaplu employ several techniques to mitigate this scarcity and guarantee food security. Seasonal migration to the lowlands is a method commonly employed. It alleviates the strain on the local food supplies during times of scarcity, while also enabling migrants to make income and remit it to their family in Khaplu for purchasing food items from the market, where prices tend to rise during winter(K. Ahmad et al., 2021).One noticed trend is that literate young men tend to view agricultural work as inferior and choose not to engage in farming and animal management. In order to fulfil the food requirements during the non-growing season, individuals in Khaplu employ several methods to store and save food. Below are descriptions of some of those:

Sadung (pit in the soil):

The practice of storing food in a "Sadung" is a widely employed method of storage in Baltistan. Sadung is a term that refers to both soil and an object that can be used to contain or hold something. Carrots, potatoes, turnip, and butter are stored in a container called sadung. The name of the food held in the pit determines the corresponding name change: turnip is referred to as mullo-dung, potatoes as allu-dung, butter as mar-dung, and carrots as waphu-dung.To create a sadung, a hole is dug in the ground either in the garden or outdoors in the field. The sizes of the storage units vary, ranging from approximately fifty kilograms to over two hundred kilograms, depending on the amount of food that needs to be stored. The merchandise is placed directly into the pit and subsequently concealed with soil.The distance between the product and the earth's surface must be a minimum of one to two feet. Consequently, the product is protected from any harm caused by freezing. Ensuring a tight seal on the sadung is crucial as it prevents air from entering, thereby altering the taste and visual appeal of the food items(S. Ahmad et al., 2021).

Rgum (wooden box):

Rgum are collapsible hardwood containers mostly utilized for the storing of flour and grains. They may be effortlessly assembled and disassembled into individual components. Despite being an antiquated technique, rgum are being produced using the same process today. The

weight of rgum can range significantly, from approximately ten kilograms to over one hundred kilograms. Rugs are stored alongside other utensils in the house's storeroom. According to popular belief, rgum are considered secure for storing flour due to its ability to prevent rodents from entering(S. Ahmad et al., 2021).

Dried Vegetables:

Various vegetables available in Khaplu are preserved through sun-drying or roasting. Due to the arid conditions in late summer and early winter, these veggies quickly become dehydrated. Potatoes and carrots are preserved in underground storage facilities called "dong" and are utilised during the winter season. A distinct technique is employed to preserve cabbage and cauliflower for winter consumption. During autumn, the entire cabbage and cauliflower plants, along with their roots, are uprooted from the ground and transplanted indoors into a room with a dirt floor. These plants are watered intermittently, provided that the weather is not excessively cold. Plants are not watered when the temperature drops below freezing point(Abbas et al., 2021).Dehydration of vegetables and their subsequent utilization throughout winter is a customary procedure in regions characterised by a single crop and harsh winters, during which no cultivation is possible. Individuals residing in such environmental conditions adjust their clothing practices and routines accordingly.

Pulses

Given that the pulses can be stored for prolonged periods. Peas are a prevalent dietary staple in Khaplu, often consumed in both their fresh and dried states. Pulses refer to leguminous crops, including beans, peas, and lentils. Although some of the peas grown in the area are eaten right away, the majority are dehydrated and stored for the winter. The green beans and black beans are ground into a fine powder. The green beans are employed in the manufacturing process of the famed pokstrani-phe, which is a variety of pea flour. Both varieties of these beans are mixed with wheat and/or barley and then crushed. These beans are commonly cultivated alongside barley and are harvested and processed simultaneously with the grain harvests. In addition, legumes like Purslane are grown in the valley and make up a substantial part of their diet. Currently, lentils are being imported from the plains due to improved accessibility(K. Ahmad et al., 2021).

Fruits and Nuts

Apricot and apricot kernels: Dried apricots are abundant and diverse in Baltistan. Typically, they are dried by the sun to preserve them for the winter season. The significance of apricots is further demonstrated by the existence of several terms in the Balti language to differentiate between fresh and dried apricots. The term "Choli" refers to fresh apricot, whereas "pharing" is used to describe dried apricots. Following are the types of dried apricot:

- Ribu pharing, the whole apricot with kernel inside dried.
- Shall pharing, the split apricot without kernel, and halves.

The term "haltap pharing" refers to a cluster of apricots that are folded together, forming a single ball-like structure. Typically, a haltap pharing contains anywhere from two to five apricots. There is a consumable seed inside. Often, damaged and low-quality fruits are dried directly on the ground and stored as animal food during winter. These apricots are referred to as naqpo pharing or black dried apricots due to their dark appearance. Dried apricots can be consumed as is or they can be boiled prior to use. Recently, certain non-governmental organizations (NGOs) have implemented the utilization of Sulphur tents for the purpose of drying apricots. The process removes dust from the dried fruit and gives it an attractive light brown tint, which increases its market value. However, the local residents do not favor it

because to its slightly sour taste(K. Ahmad et al., 2021). The apricot kernel holds greater value compared to the apricot fruit itself. In addition to being consumed raw, the kernels are roasted and combined with roasted wheat grains to create a mixture known as yoss. Apricot kernels have traditionally been utilized for household oil extraction. The leftover kernel residue from the oil extraction process is utilized as a supplement in animal feed. It is believed that providing cows with this feed enhances both the quantity and quality of their milk. Previously, oil was extracted from both sweet and bitter apricot kernels, which yielded both sweet and bitter oil. However, due to the high market value of sweet apricots, only sweet kernels are sold, and oil is now exclusively derived from bitter kernels. The tough outer layer of the kernel is utilized as a source of fuel. Walnuts are the second most significant dried fruit cultivated in Khaplu. In addition to being consumed raw, walnuts kernels play a crucial role in a traditional Balti cuisine known as moskut. Moskut is a condiment made from walnuts, herbs, chilies, salt, and oil. It is typically consumed with prapu, a unique type of starchy cuisine. Additionally, walnut oil is extracted in smaller quantities. Walnuts are also utilized for oil extraction. Walnuts are commercially traded in the market to generate monetary revenue. Mulberries are utilized both fresh and dried during the winter season. The fruit can be preserved using traditional methods such as sun drying or by using a sulphur tent. In winter, dried mulberry can be used as a nutritional supplement for a balanced diet. Apples and pears are significant fruits cultivated in Khaplu. Apples and pears are typically stored in a fresh state within boxes filled with wheat straw (phoma) or in wooden boxes (rgum) packed with grains. Apples that are dried include those that are primarily immature, damaged, or otherwise unsuitable for human eating. However, these dried apples are only utilized as animal feed.

Animal-derived products

The task of milk processing is predominantly undertaken by men throughout the year, as they are the individuals who venture into the pastures of Khaplu. Curds are then transformed into lassi and butter. Butter is definitely the most precious among all dairy products. Currently, local butter is fetching a favorable price in the marketplace. In certain instances, the local product butter is being replaced with inferior fat or oil from the market for domestic usage, resulting in its depletion. Lassi is additionally cooked to separate the solid residue, which is then utilized as a type of fresh cheese. During the summer, men dedicate a period of three to four months to tending their livestock in the highland meadows. Historically, animals are culled at the onset of winter. This event is commonly referred to as stonpheak, which involves the ritualistic murder of animals during the autumn season. Given the frigid temperatures throughout winter, meat can be preserved for an extended duration. To preserve beef, it is divided into sections and suspended in rooms or storage areas(Von Braun et al., 2005).

Economic activity excluding agricultural and farming sectors:

Due to enhanced accessibility, establishment of district headquarters, and growth in commercial and transit activities, non-farm employment prospects have significantly multiplied. Currently, a significant number of workers are employed in sectors such as commerce, transportation, tourism, hospitality, and administration. In addition to the deceleration in administrative and non-agricultural activity throughout the winter season. Individuals, particularly young males, relocate to urban areas at lower altitudes in search of temporary employment opportunities. Non-agricultural activities have emerged as a significant source of income for individuals, making a large contribution to family earnings. A significant portion of the village's population is currently involved in these activities(Ahmad Khan et al., 2013).

CONCLUSION:

With the advancement of available technology, increase linkages with the outside world, increased linkages with the outside world, increased seasonal and long-term migration to lowland cities and increased tourist activities this ma-environment relationship is changed with the passage of time. Now for instance lowland fuel is available so people do not have to take only that food which require minimum amount of fuel. All sort of food items, clothing modern household appliances, building material and so on are available and therefore the dependence on local resources, product of natural environment has drastically weekend. But in turn dependence upon outside world has increased. Social, cultural and economic linkages of local population with the outside world have also brought far reaching changes in the social cultural and economic conditions of the area. In response to the outside influence in which media is also important role, settlement layout, architectural design of houses, food, dresses, occupational preferences, cultural and social value are changing rapidly and those changes are predominantly in line with the lowland urban culture. So, in short one can say that culture which in past was more in line with the natural environment is now changing to the new culture which is now adapting the cultural features of the developed lowland urban culture.

But in all that role of environment is still important. People now prefer to grow fruit trees over field crops but only those fruit which can be grown here. House structure changed but the new structure is also in accordance of local climatic condition in which insolation is taken care of wood paneling because now wood is imported from plains and can be afforded by many. Similarly, adjustment according to the changed opportunities and given environmental condition can be seen another sector also.

Thus, after revisiting different theories regarding man-environment relationship and ground realities in Khaplu, the cultural ecological paradigm as given by Steward seems to be more applicable.

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