

Anthropogenic effects on physical landscape: A case study of Purmandal and Uttar Behni in Samba district of Jammu and Kashmir UT

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Abstract: The study "Anthropogenic effects on physical landscape" has been carried out in Purmandal and Uttar Behni area of Samba district in Jammu and Kashmir. The study area Purmandal is a tehsil in Samba district of the state Jammu and Kashmir and lies between 32.37°N-32.44°N latitude and 74.94°E-75.0°E longitude. This area is about 37km away from Jammu in south eastern side and connected with NH 44A from Bari Brahmana. It is an empirical deductive study in which field tour of three days was conducted in order to assess the area i.e role of humans in shaping the physical landscape. Detailed study was done and photographs were taken as an evidence of Anthropogenic effects. This study has revealed that Purmandal and Uttar Behni have witnessed many types of anthropogenic activities. Anthropogenic influences in the area are clearly perceptible in agriculture, mining, transportation, construction, and deforestation activities. The study has revealed the relationship between level of modernization and contrasting influence of agricultural practices on natural landscape. The study focuses on various anthropogenic dimensions in the context of the study area which includes Purmandal and Uttar Behni. The Purmandal area is suffering from various effects which are caused or played by human. These effects are in term of agricultural practices, infrastructural development, cutting of forests for domestic fuel as well as for timber and also for clearing of land to make it good for agricultural practices. To prove the anthropogenic effects on the landscape, field observations have been the main source of information. Besides few prominent local persons as well revenue officer were interviewed to make assessment of the changes taken place in the area.

Keywords: Anthropogenic, settlement, land use, modernization, deforestation, soil erosion, encroachment

1 | INTRODUCTION

Anthropogenic effects are those in which human plays an important role. The economic and human technological man lashed with modern technologies has become most powerful and has affected the physical environment adversely. Human activities affect the operation of physical processes and the result rebound on the human world. Human activities include mining, blasting of hills by dynamites for

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road and dam construction and mineral extraction, quarrying for industrial and building material etc. Human activities are of great concern to physical geographer and they attempt to reduce these activities. These activities will increase greatly over the next 20-50 years as human populations continue to grow and migrate. It is a well-known fact that the relationship between man and environment in the past has been friendly and the man was not a major destroyer or changer of the environment. Gradually man started cultivation and for this purpose he cleared forested lands and became a modifier of the environment. The study focuses on various anthropogenic dimensions in the context of the study area which includes Purmandal and Uttar Behni. The Purmandal area is suffering from various effects which are caused or played by human. These effects are in term of agricultural practices, infrastructural development, cutting of forests for domestic fuel as well as for timber and also for clearing of land to make it good for agricultural practices.

2 | LITERATURE REVIEW

This study explores the anthropogenic effects on physical landscapes, and focuses more the economic as well as cultural or other activities of man and their relationship with physical landscape. There are various scholarly works carried out by geographers, geologists and scholars from other allied fields on the anthropogenic effects on physical landscape. Many scholars worked on the realization of changes in the environment process brought by man. The nature, pattern, pace and ecological and societal consequence of land change will vary on all spatial scales as a result of spatial variation in human preferences, economic and political and pressure and environmental sensitivities [Carpentor-et-al (2007)] The impact of man's activities on many environmental process such as denudation, subsidence, sedimentation, sea coast changes, circulation of water etc. has been realized by various geologist and other scholars.

Urbanization is one of the major activities which shape the landform as **Mr. Grium-et-al (2008)** says that in particular urbanization fundamentally alters both biotic and abiotic ecosystem properties within surrounding and even at a greater distance. So, according to him these human activities influence both biotic as well as a biotic environment. Within the urbanization pattern there is a transformation of man for adjoining areas to a particular area. According to **Alag-et-al (2004) and the Bald (2005)**, around the world the rate of land change will increase generally over next 20-50 years as human population continuous to grow and migrate. As we can say that most or many of ongoing processes on the earth surface are influenced by man directly or indirectly. As **Marsh (1864)**, pointed out that realization of changes in the environmental processes brought by man. Man is also playing a very important role to change the shape of physical landscape by increasing the rate of soil erosion as **G.V.Jack (1939)**, points out "the role of man in accelerating the rate of soil erosion and suggest the need for soil conservation and control measure against soil erosion". **R.L.Sherlock (1922)** similarly pointed out that man is many more times powerful then as an agent of denudation then the entire atmosphere denuding for consigned.

Technological development or advancement plays a very important role to accelerate the human activities and degrade or reshape the existing landscape. As **W.C.Thomas (1956)**, says that the dimension of changes in various environmental processes affected by man before the wider section of scientific communities and paved the way for depth study of process and mechanism of change in environmental process induced by man and this remedial measure. Technological development in terms of extraction of mineral resources from a greater depth is a major activity of man on the surface of the earth. According to **A.H.Strahler and A.N.Strahler (1976)** the removal of support of under mining and natural masses of soil regolith and rock can put a great effect on the particular place. As we all knows that we are using two techniques to extracts the minerals from the depth i.e. open pit mining which is being done with the help of digging a huge hole by removing the material from that particular

area which directly affect the natural landscape of that particular region and the other one is the underground mining which is also dangerous for natural landform.

3 | STATEMENT OF THE PROBLEM

The area under study i.e. Purmandal and Uttar Behni forms part of recently created Samba district. These two settlements evolved as sacred destination for Hindus and appear in religious mythology. The study area has holy river Devak flowing across its surface. Because of the religious belief, this river is known by different names in the Uttar Behni and the Purmandal region as Gupt Ganga, Ganga Mai etc. During the early period these areas were thickly covered with dense vegetation and were the home of the wildlife. But slowly with the passage of time the influence of human behavior and other physical factor resulted in the degradation of the forest. Now these area are connected to the nearest urban centers which has resulted in the change in demographic scenario. Agriculture remains a dominant activity for domestic as well as commercial purpose in the area. Use of modern methods like tractor for agriculture has made inroads in few pockets and with the result one finds some variation in the way this activity has left its footprints on the landscape. Pastoralism which seems to supplement the agriculture for the livelihood of the people too has been a cause of bringing about changes in the physical setting. Human desire to tame the natural course of streams by making embankment or retaining wall along the banks has also modified the local landscape. The increased accessibility of the area and rapid pace of urbanization in the close proximity has exposed this area for the exploitation of its resources particularly sand sediment, boulder etc. As mentioned earlier, the religious significance of these settlements and changes in the accessibility and means of transportation have also shown visible marks on the face of the area.

4 | METHODOLOGY

Finding order with reason and instruction with a perspective and out of disorder can be called method. Methodology is the systematic, theoretical analysis of the method applied to a field of study or the theoretical analysis of the body of methods and principle associated with a branch of knowledge. So far as the Methodology for the present study **"Anthropogenic effects on physical landscape: A case study of Purmandal and Uttar Behni in Samba district of J and K UT"** involves problem, identification, data collection, data processing, and data analysis and data representation cartographically. The methodology for this study included field study of both the settlements. The field work was conducted on 11th and 12th of February 2024. To prove the anthropogenic effects on the landscape, field observations have been the main source of information. Besides few prominent local persons as well revenue officer was interviewed to make assessment of the changes taken place in the area. To capture the changes and continuities in the landscape, photographs were taken. Field observations provided information for drawing sketches of the area in the laboratory.

5 | OBJECTIVES

- (1) To study the relationships between human and natural environment.
- (2) To study the impact of human settlement on physical landscape.

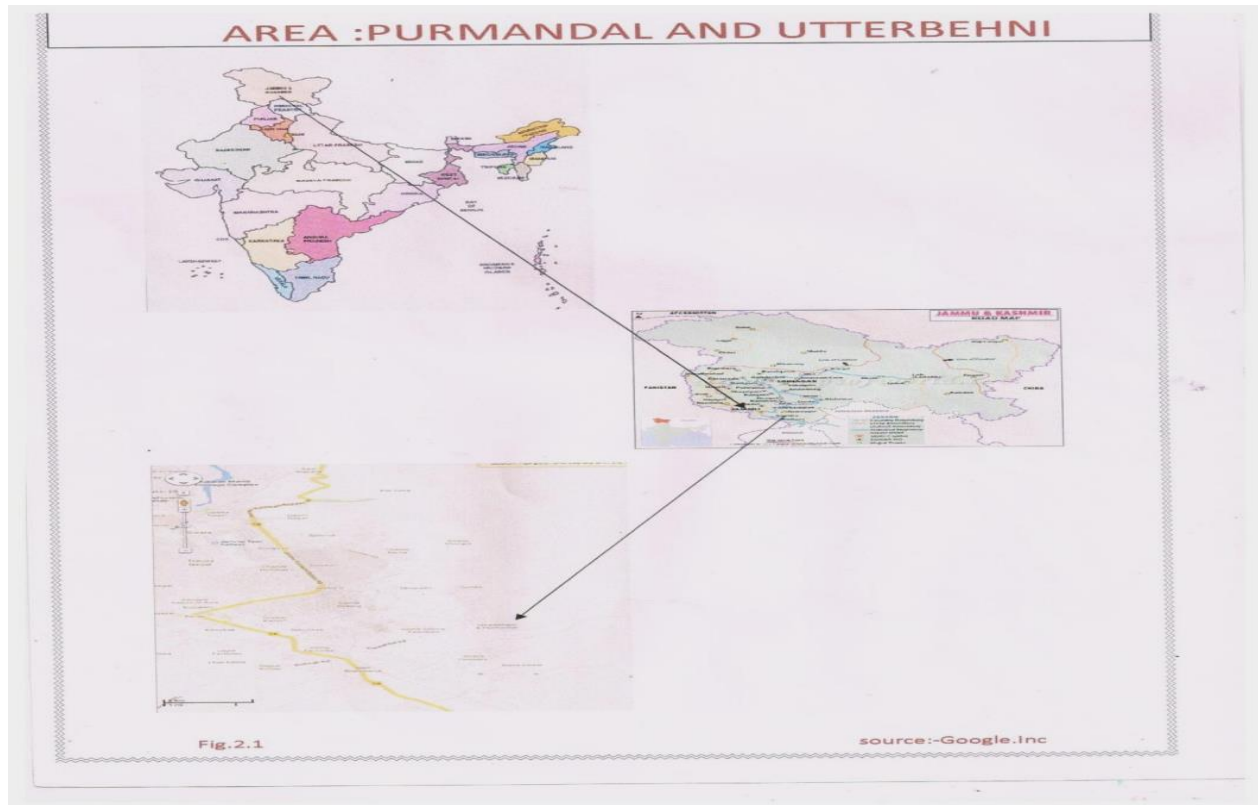
6 | GEOGRAPHICAL PROFILE OF STUDY AREA

6.1 Location and Physiography

The study area Purmandal is a tehsil in Samba district of the state Jammu and Kashmir and lies between 32.37°N-32.44°N latitude and 74.94°E-75.0°E longitude. This area is about 37km away from Jammu in south eastern side and connected with NH1A from Bari Brahmana. From Bari Brahmana Purmandal is connected with metalled road. The total area of Purmandal and Uttar Behni is 101 sq km.

Uttar Behni is a block which lies in south of Purmandal on the bank of same river Devak. It is also connected with a metaled road with district head quarter Samba & Jammu.

Physiography



Purmandal lies in the middle and upper Shiwaliks surrounded by hills and hillocks. Purmandal has an average altitude of about 500 meters above mean sea level, whereas Uttar Behni has an elevation of about 400 meters above mean sea level. Purmandal area has a very steep slope and rough topography, whereas Uttar Behni has gently sloping and plain area.

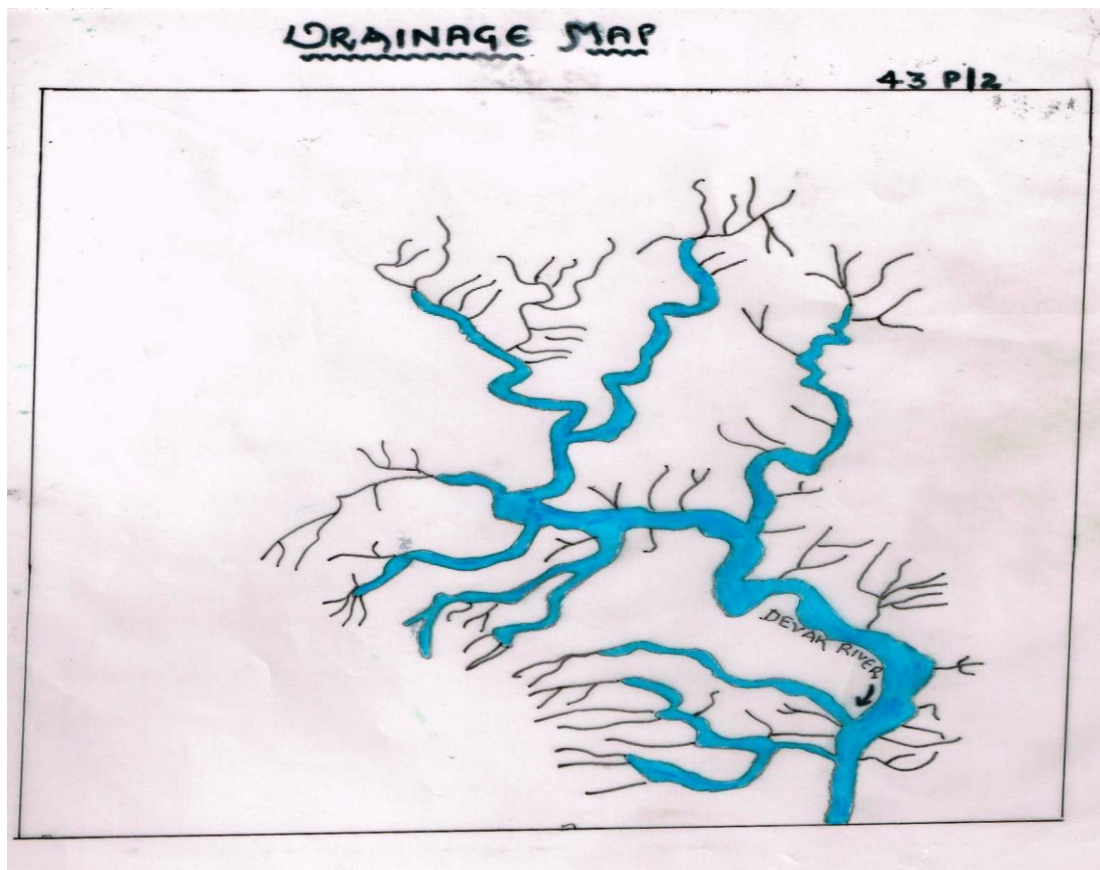
6.2 Climate

The climate of Purmandal is sub-humid type from July to Sept. This region gets about 107 cm of rainfall. Temperatures in summer may vary from 23.4⁰ to 43.0⁰ Celsius. On the other hand, in winter temperatures may move in the range of 4.3⁰degree to 26.2⁰ Celsius. Purmandal climate is characterized by following set of three seasons in a year.

- summer season (April to June)
- rainy season (July to September)
- winter season (November to March)

6.3 Drainage

River Devak is only the most important river flowing in Purmandal and Uttar Behni area. This river has a large number of tributaries. River Devak follow the dendritic pattern. This is old route for Mata Vaishno Devi Shrine and still operating route by transhumant communities who shuttle between Jammu plain and high mountains.



6.5 Soil and Land Use Pattern

Purmandal and Uttar Behni has a soil of sandy and sandy loam and also clayey in some plain regions. Wheat cultivation is common practice here from long period of time. The soil of plain areas of Uttar Behni is highly fertile and can support multi cropping system.

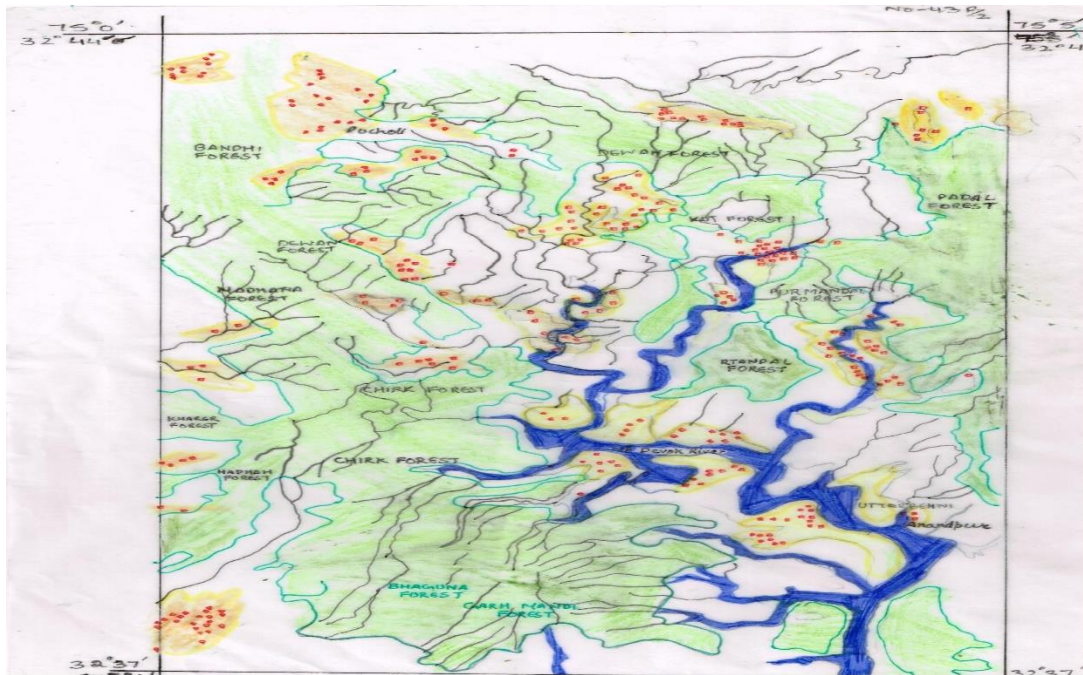
Major soils in study area are:

1. Alluvial soil
2. Sub-Mountain soil



Fig. 19: Soil Types found in J&K
 © Sh. Ravi Kumar Revo, SFRI, J&K)

1. Mountain meadow soil
2. Brown Hill soil



Land Use and Land Cover Map of Purmandal

7 | RESULT AND DISCUSSION

7.1 Agriculture

The people of Purmandal area are mostly or totally depend on primary economic sector i.e. agriculture practices. This activity has been a tradition in this area. Three types of crops are grown here viz. Kharif, Rabi and Zaid. Climate is favorable for these crops. The study area lies in the middle and lower Shiwaliks, so to make agriculture practice a sustainable economic activity the area has witnessed successive cutting of slopes. Out of total 101 sq. km of the area of Purmandal about 40% area is being devoted to agriculture land. Ploughing of land is only done with the help of oxen and there is less use of tractor or other mechanism in this area. Uttar Behni which lies to the south of Purmandal is a village. The Uttar Behni area is mostly lying in lower Shiwaliks and plain area. Most part of Uttar Behni is devoted to agriculture fields, along both the bank of river Devak. A vast area in Uttar Behni where the evidences show that the area was full of vegetation is now under the agricultural fields and has thin vegetation.



Figure 7.1 A panoramic view of agricultural field showing wheat crop in Uttar Behni area

7.2 Deforestation

Interaction with local peoples has yield information that this area was full of vegetation and covered with thick deciduous forests. On this basis we can say that deforestation in Purmandal is being done. People cut the trees and clear the land for many purposes like for timber, fuel wood etc. So for these purposes we need a huge amount of wood.

Being a rural area many forest were used for fuel woods, as a domestic purposes, such as chulhas, furniture making etc. And this area is mainly agricultural dependent, so for rearing animals many species of plants were over grazed. Besides, steady developments of the infrastructure like roads, bridges, expansion of the settlement and market have also affected the vegetation cover in the area



Figure 7.2 A panoramic view of deforestation in Uttar Behni area

7.3 Over Grazing

One of the most serious problems in Uttar Behni and Purmandal is over grazing. This is due to the fact that the people of this area are dependent on both agricultural and pastoral activities. The rugged topography of the Purmandal area has driven people to rear the cattle like cow, buffalo, horses, camels and goat and this has also to some extent been the cause of denudation of forests. In Uttar Behni area the land which is mostly used for grazing lies on the left bank of the river Devak. And this area is grazed by the livestock and has witnessed more denudation than the other parts of the area. The north side of the Purmandal area has undulating slope and is suffering from erosion because of overgrazing.

Causes of over grazing in Purmandal and Uttar Behni:

Economy of this area is generally depended on agriculture i.e. crop forming and livestock rearing and lack in fodder crop. The rugged topography of the area has been a constraint on the expansion of agriculture land. As we have already discussed in pervious chapter that the area is being used as a route by transhumant communities from centuries. So, people use to stay here for some time to continue their journey with their livestock which affect the grazing land.

Effect of over Grazing:

In Purmandal the main effects of over grazing are as follow.

- Soil fertility is diminishing and becoming unfit for agriculture.

- Slope replacing is also caused by soil erosion.
- Loss of species diversity.
- Ecological imbalance.
- Decreasing in water table.



Figure 7.3 A panoramic view of Purmandal where from transhumant communities like Gujjar are travelling with their herding



Figure 7.4: A panoramic view of Uttar Behni which show the grazing land and its condition because of over grazing

7.4 OVER EXPLOITATION:

Excessive use of minerals and resources are called as over exploitation. Since, most of the area is not that much developed in infrastructure. So, the level of exploitation is also limited only to some habitable areas. Most of the Devak banks have been encroached by the people in the village of Purmandal for the development of the area like setting up of business units and community halls etc. on the river banks. There is also encroachment of the forest area for expanding the agricultural lands and the expansion of village and settlements. There is also illegal sand mining going on near the banks of the drainage basin of river Devak.



Figure 7.5: A panoramic view of over exploitation of natural resources like soil and vegetation

7.5 Pollution

Pollution is the introduction of contaminants into the natural environment that caused adverse change. There is not too much pollution in the Uttar Behni and Purmandal areas.

Some types of pollution are as follows.

Air pollution:

Due to automobiles domestic use of fossil fuels, which make the environment polluted.

Soil pollution:

Much of study area is affected by soil pollution. As people of this area throw their garbage on the agricultural area without dumping them, there is no proper disposal of solid waste. Sometimes, they burn the garbage which leads the air pollution leading to environment degradation.

Water pollution:

The main causes of water pollution in this area are both natural and anthropogenic. The natural causes are mainly landslides and mass wasting which is leading to erosion and siltation of the stream, degradation potable of water. The factor such as dumping of garbage near water sources have polluted and degraded the quality of water. The development activities had also cause soil pollution.



Figure 7.6: A panoramic view of Uttar Behni. Cremation in river Devak which is a cause of water pollution

7.6 Encroachment

There is continuous encroachment of land due to rapid development in the areas of Uttar Behni and Purmandal. Uttar Behni area is more affected by the floods caused by the Devak stream because of its topography as it is a plain area. The construction on flood protection works on both banks of river Devak from Uttar Behni to village Brotta is in progress at a cost of Rs. 3.20 crore under state sector. [2024, Kashmir times] On the auspicious of normal day, especially on the Somavati Amavasya, full moon falling on Monday, the spirit of place on a special day is very high. At night, people burn wood and temporarily modifying the land.



Figure 7.7: A view of Uttar Behni area showing human efforts to check encroachment by the river Devak. Note the embankment constructed on the left bank of the river

7.7 Infrastructure Development

The area of Uttar Behni and Purmandal has a very poor infrastructural development. The infrastructure of this area is developed in both physical and social terms. It has been estimated that the infrastructural development in this area has been taken places since the 19th century. The occasional visit of Ranjit Singh [1780-1839], the ruler of Punjab and his attachment to this area resulted into the construction of many houses by his courtier.

During Dogra rule [1846-1947], Gulab Singh constructed local forts at Purmandal and elevated it to a status of birth, a place of pilgrimage, after him, Ranbir Singh his son build huge temple and complexes at Uttar Behni but all this had not been developed at their best.

But today, there are many primary schools and recreation center. There is small market in this area and community centers like Dharamshala, block development office and police station etc. but still most of the area has less infrastructural development.

The houses of this area are pacca with considerable number of kaccha house also present. The settlement in this area is linear type of settlement. The area has also a small office of soil conservation and forest department of J & K.



Figure 7.8: A view showing infrastructural development in Purmandal area

7.8 Soil Erosion

Soil erosion means the removal of the top fertile layer of soil by external agents like wind, running water etc. There are various causes of soil erosion like deforestation, overgrazing, over cropping etc. In the area of Purmandal and Uttar Behni, it has been noticed that the people used to do intensive type of agriculture most of the population in these people have an agrarian economy and dependent on agriculture directly or indirectly. People of these areas are not well educated about the cropping pattern, terracing contour etc. They are using traditional method of agriculture. This leads to the problem of soil erosion in these areas. The total number of households in Purmandal is 250 and total population is 1248(2001). Most peoples of this area are rearing cattle like cow, hen, horse etc. to increase income. There is a problem of overgrazing there which also leads to the problem of soil erosion. Now, people for their own purposes are clearing the forest and use most of the land for agricultural purposes. Clearing of vast area of forest has led to the problem of deforestation. During rainy season, when the water level of river Devak is high, the soil from the adjacent areas near river Devak is eroded and the soil of the cultivated or arable land is also eroded. Because, tree root helps in the holding the soil and do not let the soil to be eroded. But due to deforestation, the rate of soil erosion in these areas is very high. The soil in the study area is sandy to sandy loam. The soil has not been fully developed on plain due to undulating topography. Most of the soil comprises of residual sand. The extreme undulating terrain causes a lot of erosion, removing the clay material. Poor vegetation also influenced soil erosion. Sand mining for the construction of domestic and govt. infrastructure has also caused soil erosion.

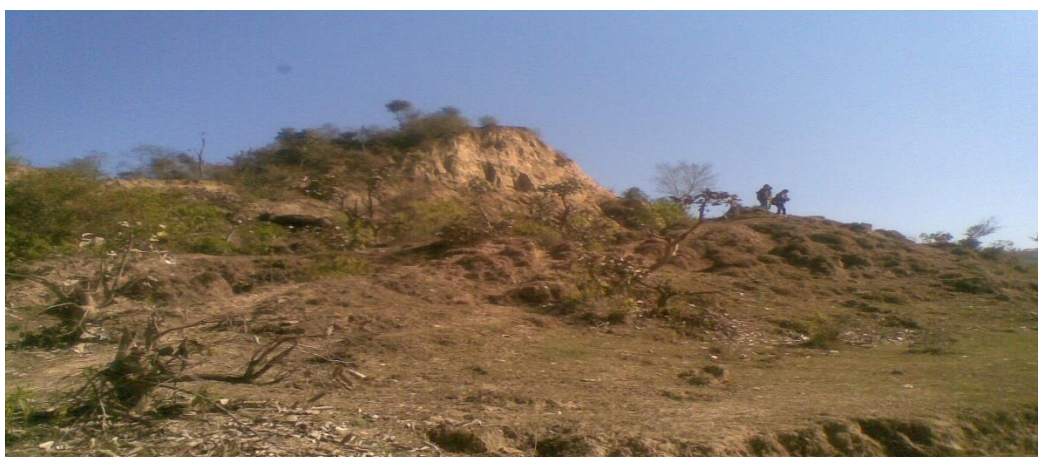


Figure 7.9 A panoramic view of Uttar Behni showing soil erosion by over grazing, cutting for road and deforestation

8 | CONCLUSION AND SUGGESTION

This study has revealed that Purmandal and Uttar Behni have witnessed many types of anthropogenic activities. Anthropogenic influences in the area are clearly perceptible in agriculture, mining, transportation, construction, and deforestation activities. The study has revealed the relationship between level of modernization and contrasting influence of agricultural practices on natural landscape. Another insight gathered from this survey is how improvement in linkages and technology acts as a double edge weapon in shaping a place. The increase in the mining and pilgrimage activities has been of the case in this regard.

REFERENCES

- Bloom, A. L. (2004) *Geomorphology*. New Delhi: Printice Hall of India Private Limited.
- Hussain, Majid (2007) *Jammu & Kashmir Geography*. Pacca Danga Jammu: JK Publishers.
- Katyal, T. (1989) *Environmental Pollution*. New Delhi: Anmol Publication.
- Kullar, D.R. (2000) *Comprehensive Book of Indian Geography*. Ludhiana: Kalyani Publishers.
- Pande, Rajnish. et.al (1998) *The Himalayan Environment Issues and Challenge*. Delhi: Daya publishing housing.
- Singh, Savindra (2000) *Geomorphology*. Allahabad: Prayag Pustak Bhawan.
- Trivadi, R.N. (1992) *Environmental Problem*. New Delhi: Anmol Publications.

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