CHAPTER I

THE REGION, ITS PHYSICAL ENVIRONMENT

Spatial patterns on the surface of the earth are the result of a complicated interplay between physical and cultural factors which collectively fall under the purview of 'Environment'. Although the physical conditions of a region do not entirely provide satisfactory explanation for the conditions of a man, the concept that physical Geography is essential to cultural Geography holds good. No body can interpret the cultural Geography of a region without knowing the physical conditions prevailing there. It would be, therefore, worthwhile to know a brief account of physical environment of the study region.

Location and Extent:

Bundelkhand Region of U.P. (24° 11' to 26° 27' N.Lat. and 78° 00' to 81° 34' E.Long) lies in central part of India (Fig. 1.1B). The region, comprising of five districts and 22 tahsils, is a separate administrative division of the State (Fig. 1.1A). Geographically, the region lies between the Gangetic plain in north and the Vindhyan upland in south, while the eastern boundary is determined by Allahabad district. The region covers an area of 29638 Km² inhabited by 5436187 persons (Census 1981).

Geologic Structure:

Due to its location at the northern edge of old peninsular
pattern. The gniessos of Kabrai area (Hamirpur district) are hybrid while in the west, they are bedded due to the effects of some forces from westerly direction. Here these rocks are largely fractured. Towards the Yamuna in the north, the gniessses disappear below the alluvium. Wadia opines that Bundelkhand gniess is traversed by extensive dykes and sills of a coarse grained diorite which persists for a long distance. It is also traversed by a large number of coarse pegmatite veins in a loss of granite.

(ii) Transitional System:

Bijawar series, known as transitional system, must have been formed in pre-vindhyan period. This system, succeeding gniessses, occupies a narrow strip of about seventeen miles in south of Macaura and west of the river Dhasan (Lalitpur district). It consists of sandstones, limestones and slates. Here the rocks of transitional system are overlapped by the vindhyans but their outcrops, extending few miles, are found near Sonrai village in Lalitpur district.

(iii) Vindhyan system:

This system is spread around Bundelkhand gniessses and granites in southern and south-western parts of the region. There was an extensive geosyncline, called as 'Vindhyan Sea', in the region where the Vindhyan stand now. The sediments, carried by the rivers from the Aravallis, were deposited in
the geosyncline. The isostatic adjustment in the south and the tectonic movement in the west resulted in the formation of the Vindhyan ranges. The ranges of this system are classified into two broad divisions: The lower Vindhyan and the upper Vindhyan. The lower Vindhyan intervene between the Bijawar series and the upper Vindhyan. The lower Vindhyan occur in patches near 'Xurrat' village in Lalitpur district. These are composed of sandstones and silt. The upper Vindhyan are characterised by facing escarments. A few outliers occur at Dongra and Dongra Kalan villages in Lalitpur district. These consist of massive sandstones and conglomerates. The Vindhyan sandstones are much economic importance. The great monumental buildings of history are made of these stones.

(iv) Recent Deposits:

Alluvial sediments, recently deposited between the Yamuna and southern highland, cover an extensive area in northern part of the region. The Betwa, Dhasan, Ken, Baghain and their tributaries flowing from south-west to north-east, have carried and deposited a vast amount of sediments in the north. The thickness of the deposits is deeper in the north and shallower in the south. The texture of sediments become more and more refined from south to north.

Relief Features:

Undulating mountainous surface dissected by torrential
streams in the south and the stretch of homogeneous plain in
the north are the chief physiographic characteristics of the
region (Fig. 1.2A). The physiographic contrast between the
southern and northern parts is so obvious that the region
can be easily divided into two parts: upland Bundelkhand
and lowland Bundelkhand. In the west, the termination of
the former into the latter is so gradual that no precise line
can be drawn between them, but in the east, the latter starts
just after the former ends. However, the Contour line of
225 metres can be taken as a line separating the former from
the latter.

Upland Bundelkhand:

It appears to be detached in two areas: The one in the
south-west and the other in the south-east. In the south-west,
south of Jhansi and further southwards, the region becomes more
and more undulating broken up by numerous rivers and 'nals'.
In the extreme south-west, the Vindhyan mountains form steep
escarpments. The line of escarpments, running from Kurrat
village in the south-east to Jakhlaun in the south-west
(Lalitpur district), is broken up at few places as Dhaurra,
Narhat and Madanpur villages. To the south of these escarpments
is a plateau intersected by wide valleys. Further south of
the plateau is another range of escarpments. Here the Betwa
river forms a narrow gorge in the west. This portion of upland,
bounded by the vendhyar escarments in the south, is a
tableland with average elevation of 450 meters and the highest
point being Lakhanjar hill (612 meters) in the extreme south-
east. To the northwards of the vendhyan escarments, the
elevation falls gradually and the land appears to be a rolling
plain sloping northwards. The height above mean sea level is
280 meters at Babina station and 255.15 meters at Jhansi
station. Main streams which cross this plain are the Shahzad,
Sajnan and Jamni. Further north, the relief becomes more
diversified and this portion of upland is dotted with numerous
granitic hillocks. The average elevation is about 270 meters
above mean sea level. These hillocks have been rounded by
weathering processes. Apart from these hillocks, two main
dissected ranges transverse this portion. The one starts from
Baruasagar and runs north-eastwards through the tahSils of
Jhansi and Moth. The other starts from Kathera (in extreme
south of Mauranipur tahsil) and runs northwards. The south-
eastern portion of upland is bounded by the vendhyachal range
in the north and the Panna range in the South. A plateau lies
between these two ranges running from east to west. This
portion of upland has an average elevation of 300 meters above
mean sea level. The vendhyachal range runs westward from
village Salwahi near the Yamuna to the Anusuiya hill and
reappears in Hamirpur district. The range is low in the east
as compared to the west. The Panna range, forming the southern
boundary of the region in the extreme east, has the average
height of 150 meters above general level of the plateau.

Lowland Bundelkhand:

In the extreme south of the low land the granites often appear in the form of rounded hillocks, but these become rare towards the north and finally disappear near the town of Rath. To the north of this town, there is nothing to disturb the stretch of the plain. The granitic plain does not show homogeneous characteristics in its whole stretch. In west of the Dhasan river, the granitic plain is highly eroded by the tributaries of the Betwa and Dhasan rivers while in the east of the river, it is less eroded than that of the west, although granitic outcrops are not rare. The Contour line of 150 meters may be taken as a dividing line between the areas of granitic plain and the low land. The average elevation of the plain varies from 225 meters in the south to 120 meters in the north. The general slope is from south-west to north-east. The heights above mean sea level at some places will tend to show the general slope of the plain. In the west, the height at Mauvaripur is 209.70 meters and about 25 miles to the north-east at Garaitha it is 174.60 meters, further north-eastwards at Gohand (Rath Tahsil, it is 149.40 meters and at Kurara (Hamirpur tahsil) in the tract between the Yamuna and the Betwa, it is 121.80 meters. In the middle of the plain, the height at Mahoba is 210.30 meters which falls north-eastwards to 121.80 meters at Ikauna (Maudaha tahsil) and 109.80 meters at
Pailani (Banda tahsil). In the east, the same pattern of sloping is found. The height at Chitrakut dam is 129.90 meters which falls to 102.60 meters at Rajapur near the Yamuna.

The plain is well drained by the Pahuj, Betwa, Dhasan Ken, Baghain, Paisuni and their tributaries. There are well marked watersheds. In the west, a water divide separates the drainage basin of the Pahuj from those of the Kunchmalanga and non which are separated by a higher ground in the south-east from the Betwa valley. The Betwa valley is separated by another piece of higher ground bordering the river from the Birma-Chandrawal plain. The Ken-Baghain plain, lying in the middle east, is less eroded than the Birma-Chandrawal plain. In the extreme east, a triangular area in the east of the Baghain river is drained by many northward flowing streams which form numerous small doabs.

**Drainage Pattern :**

The drainage pattern of a particular region shows the natural plan of water system in that area. It is generally recognised that drainage patterns reflect the influence of such factors like the initial slope, inequalities in rock-hardness, structural controls and the recent geological and geomorphic history of the drainage basin. The slope of the land runs from south-west to north-east and forms the natural drainage system of the region because all the streams
flow according to the slope (Fig. 1.3). The nature of the streams is consequent and they form dendritic drainage plan. The region is drained by the Yamuna system. The Betwa, the Ken, the Baghain, the Dhasan etc. are the main tributaries of the Yamuna. The rivers, which originate from the vindhyan, join their main rivers after flowing through the upland and low land. A continuous process of soil erosion has been into operation in the south consequently a badland topography has been produced by gully formation. The rivers and streams have cut their banks abruptly and flow with fast speed. Flowing in the north plain called as 'Trans-Yamuna Plain', they receive considerable amount of water and form the meanders.

The geologic structure and surface configuration exert their impact directly on the drainage pattern. In the southern upland, the river courses are mainly straight and banks are steep while in the northern low land, they present many loops and bends. Their speed is slower on account of which the rate of erosion decreases and the deposition of finer alluvium begins. The drainage direction in the south is from south to north and in the north it varies slightly from south-west to north-east. Only Yamuna river flows from north-west to south-east. The main rivers of the region are:

**The Yamuna:**

This is the main river of the region. It enters in the region at village Sitaura in the Jagmanpur Jagir (Jalaun district) where it is joined by Singh river. It makes the
entire northern boundary of the region. It is insignificant for the purpose of irrigation as the stream is well below the level of the southern bank (right bank) which, with few exceptions, forms an abrupt cliff of 20 to 60 meters of height, and does not permit successive penetration. In the study area, the length of this river is about 280 kms but the width varies according to the season and terrrian. In Banda district, it covers a width of 300 feet in May, 1300 ft. during the rains and in Jalaun district 600 ft. in May but 1600 ft. in the rainy days. The depth of the river varies from 20 ft. to 50 ft. Ravine topography and the cliffed banks render the river useless for irrigational purpose except the lift irrigation at few places.

The Betwa:

The Betwa, with its several tributaries, is another main river of the region. It rises from the vindhyan ranges near Kumari (Bhopal) and enters into the region near Dhogri (Lalitpur district). Flowing northwards for about 96 Kilometers, it turns in north-east direction and joins the Yamuna near Hamirpur town. The Jamni, Dhasan and Birma are the important tributaries of this river. The stream is generally confined between elevated banks and flows in a deep rocky channel forming a series of deep pools and picturesque character. Near Badron, seven miles
north-west of Jakhura, is the Karkara fall facing east and cutting its way through a narrow gorge of volcanic rock purple brown in colour.

The Ken:

The Ken also rises from the Vindhyan hills in Damoh district of Madhya Pradesh. It touches the region at the village Bhilhora near Kartal (Nairini tahsil) and joins the Yamuna near Chillatara village (Banda tahsil). The right bank of the stream is generally high and steep and ravines can also be seen there. But the left bank is gently sloped and is subject to fluvial action which has formed an extensive alluvial plains called 'Tarai' or 'Tir' or 'Kachhar'. From Ken, several canals have been taken out and they serve agriculture through irrigation.

The Dhasan:

The Dhasan, a tributary of the Betwa, approaches the region at the village Bangwan (Mahroni tahsil) by cutting its way through the Vindhyan hills. The Sukhani, the Lakheri and the Chuinch are the main tributaries of the Dhasan. It has been dammed at Lahchura in Jhansi district where the Dhasan canal system is already located at Pahari (opposite Deori) and a second water reservoir has been made for the canal system. Hence, it is very important river of the region.
The Pahuj:

Rising in Gwalior district of Madhya Pradesh, the river enters in the region at the village Ilaunji in Tahsil Jhansi. It flows mostly through rugged topography and does not have a deep bed. It is a small river, but during the monsoons it is subjected to sudden rush of water and causes devastating floods. It is useful neither for irrigation nor for navigation due to ravines and nallas.

The Baghain:

This river rises near Panna (Madhya Pradesh) and touches the region at the village Masauni Bharatpur (Banda). The banks of the stream are generally shelving, but at some places they are abrupted. It is a small river but dangerous in rains because it pours down a large quantity of water. The sand and Kankers of its deposits are very much useful for building and road construction. It is believed that Baghain bears age bearing rocks.

The Paisuni:

The Paisuni makes its appearance at Chitrakut just after taking its source in M.P. across the Banda district. Though very small in length and width both, mythologically it has great importance specially for 'Hindus'. It was associated with Ram's exile during which he lived for some time on the banks of this river. Economically it has
also significance for Karwi tahsil where lift irrigation scheme has been launched through this river and it also provides drinking water facilities to the Patha area of the region.

Considering all the rivers, concisely chief characteristics of the streams are as follows:

(i) Yamuna is the main river in the study region which is navigable throughout the year.

(ii) All other streams, which are the tributaries of the Yamuna river, have their origin from the Vindhyan ranges and are not suitable for navigation throughout the year.

(iii) Geologically, all the streams excepting the Yamuna have their origin in quartz reefs and veins of crystalline rocks. This nature of rocks often creates the floods in the monsoon period.

(iv) During rains, all the streams abruptly swell up, but subside after the rains.

(v) To some extent, all the streams are free from sand and silt sediments and provide irrigation facilities to the region.

Climate:

The central position of the region between the
monsoon types of maritime climate of the east coast (the Bay of Bengal) and the tropical continental dry climate of the west (Indian Desert) imposes the features of transitional climate. The climate of the region is characterised by excessive heat during the summer months and mild cold during the winter. The average annual temperature is high throughout the region. The mean annual temperature of Orai is 22.50°C and that of Jhansi is 26.50°C but their monthly mean values vary considerably from the annual means. The region gets the maximum rainfall from the south-westerly monsoon advancing towards north-west. The mean annual rainfall varies from 90 cms in the north-west to about 120 cms in the south-east. (Fig. 1.4A). The year may be divided into three seasons:—

(i) a cool dry season of northerly winds from mid-October to February followed by

(ii) a hot dry season from March to the middle of June, opening way to

(iii) a hot wet season of south-westerly winds from the middle of June to mid-October.

From mid-October onwards to February, the weather gradually crystallizes into cool and mainly dry season. The mean of daily minimum temperature is recorded by Orai (8.44°C) followed by Jhansi (9.2°C) and Banda (9.6°C) in the month of January. December and January
are the coldest months of the season when cold waves sweep over the region from the west or north-west, the nights become chilly and frosty. Sometimes, the western cyclones provide the rainfall which never exceeds 5% of the annual rainfall. This rainfall is much beneficial for the crops.

By March, the days and nights get warmer. The heat continues to increase up to May and mid-June. May and June are the hottest months of the season. The average daily maximum temperature of 43°C is recorded by Banda in May. Banda records the highest number of sun-strokes every year between the period of May and mid-June, probably due to intense terrestrial radiation and lack of haziness in the sky. One or more pre-monsoon showers with lightening and hail are occasionally marked in the region in the months of March and April.

With the advent of summer monsoon in the third week of June, the temperatures begin to fall. The mean monthly temperatures during the rainy season vary between 22°C to 25°C with relative humidity varying between 70% to 90%. The month of July, August and September receive the maximum share of rainfall (above 95%). Towards the month of October, the amount of rainfall decreases. The orography of the region, related with the tropical depressions originating in the Bay of Bengal and the Arabian sea, is responsible for the rainfall. The south-west winds are
observed from June to October. The winds flow due to a low pressure area in north-west India. So they arrive from both the Arabian sea and the Bay of Bengal. The direction of winds in these months are westerly or south-westerly. The velocity of winds is maximum between the months of April to July (Fig. 1.4B). Jhansi records the mean wind speed of 3.9 km. per hour in January, 5.8 km. in April, 8.2 km. in June, 6.9 km. in July and 4.3 km. in October. Relative humidity (at 08.30 hrs.) varies between 26% in May to 88% in August (Fig. 1.4C). In rainy season, the region receives the rainfall above 80 cms. The distribution of rainfall is irregular in space as well as in time. Although an amount of rainfall received in rainy season is quite enough for agriculture, facts are otherwise. In fact, in agriculture, it is not only total amount of rainfall which is sufficient for the needs but the proper amount of rainfall, required by a particular crop at a particular time, is significant much. The arrival of monsoon is uncertain. Sometimes it may start one or two weeks earlier or later. Similarly the summer monsoon may end earlier or protract more making the sowing of 'rabi' crop uncertain.

Natural Vegetation:

It is the greatest self-renewal resources and one of the most striking features of a landscape. The forests
are of vital significance to amplify the effectiveness of rainfall by minimising run-off, maintaining the water table and increasing the humidity by transpiration. Tiwari remarks that forests are an important source of fuel and raw materials, such as timber, bamboos, lac, gum etc. They further help in the conservation of soil fertility and play an important role in the maintenance and regulation of water regime of the land. The organic matter they yield increases the water holding capacity of the soil, thereby reducing run off. They exert a beneficial influence on agriculture and on the climate of the region where they are found.

The forests of the region cover 23,993 hectares of land representing 8.10% of the total geographical area of the region. This is less than the goal set by the National Forest Policy of India. The district-wise forest cover and per capita forested area have been shown in table 1.1. Banda and Lalitpur districts possess more than 60% of the total forested area of the region, while Hamirpur, Jalaun and Jhansi districts have only 35%. The per capita forest cover is also the lowest in the districts of the region. Lalitpur shows the maximum per capita forest area (0.15 hectares) followed by Banda (0.07 hectares), Hamirpur, Jalaun (0.03 hectares each) and Jhansi (0.02 hectares).

Forest are distributed in the region according to different ecological combination of rainfall, soil and topography. The upland areas are richer in forests than
TABLE 1.1
FOREST COVER IN THE REGION, (1983)

<table>
<thead>
<tr>
<th>Districts</th>
<th>% of forest area to</th>
<th>Per capita</th>
<th>forest area (in hectares)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Forest area of the region</td>
<td>Total area of the districts</td>
<td></td>
</tr>
<tr>
<td>Jhansi</td>
<td>13.55</td>
<td>6.64</td>
<td>0.02</td>
</tr>
<tr>
<td>Lalitpur</td>
<td>27.67</td>
<td>13.40</td>
<td>0.16</td>
</tr>
<tr>
<td>Hamirpur</td>
<td>15.54</td>
<td>5.18</td>
<td>0.03</td>
</tr>
<tr>
<td>Jalaun</td>
<td>10.57</td>
<td>5.62</td>
<td>0.03</td>
</tr>
<tr>
<td>Banda</td>
<td>32.66</td>
<td>9.73</td>
<td>0.07</td>
</tr>
<tr>
<td>Region</td>
<td>100.00</td>
<td>8.10</td>
<td>0.06</td>
</tr>
</tbody>
</table>

the low land areas due to undulating topography and the rocky soil cover. The density of forests decreases from south to north (Fig. 1.5). The tahsil of Mahrauni, Lalitpur, Jhansi, southern portion of Mauranipur, Mahoba and Karwi are covered with forests which are dense in the mountains and river valleys. The Chief trees are teak, salai, mahua, dhaw, saina, dhak, khair tendu and sej. Although the forests are almost absent in the northern plain, some patches of babuls are found. The ravine tracts of the larger rivers are marked with shrubs and grasses. The grass lands of considerable extent are found in Jhansi and Jalaun districts. In the northern plain, the forests have been badly destroyed hence less important, but in the south, these are the main source of income. The people are benefitted as they get the employment in
the forests and avail wood for housing, fuel and other purposes. For the conservation and administration purpose, they have been classified under three categories (Table 1.2):

(i) Reserved forests,
(ii) Protected forests,
(iii) Unclassified forests.

(i) Reserved Forest:

These forests are fully controlled by government and treated as national prosperity. The percentage of reserved forest in Jhansi is 47.69, in Banda 32.56, in Jalaun 13.43 and in Hamirpur 4.00.

<table>
<thead>
<tr>
<th>Districts</th>
<th>Percent to total Forest Area under</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Reserved forests</td>
<td>Protected forests</td>
<td>Unclassified forests</td>
<td></td>
</tr>
<tr>
<td>Jhansi including Lalitpur</td>
<td>47.69</td>
<td>00.89</td>
<td>51.42</td>
<td></td>
</tr>
<tr>
<td>Banda</td>
<td>32.56</td>
<td>-</td>
<td>67.44</td>
<td></td>
</tr>
<tr>
<td>Hamirpur</td>
<td>4.00</td>
<td>-</td>
<td>96.00</td>
<td></td>
</tr>
<tr>
<td>Jalaun</td>
<td>13.43</td>
<td>-</td>
<td>86.57</td>
<td></td>
</tr>
<tr>
<td>Bundelkhand Region</td>
<td>24.02</td>
<td>00.89</td>
<td>75.09</td>
<td></td>
</tr>
</tbody>
</table>

Source: Office of the Chief Conservator of Forest, U.P., Lucknow.
(ii) **Protected Forest**:

These forests are also under the control of government but the 'Bund' is occupied by the people. Licences are to be issued to people to cut the trees and to graze the cattle. In the study region, such types of forests are found only in Jhansi district.

(iii) **Unclassified Forests**:

These forests are owned by landlords and known as 'Pachpan paintalis'. A compromise was laid down by the Government with zamindars in year 1880, in which it was decided that after payment of all expenses of collection, supervision etc., profits should be divided between government and zamindars in the proportion of 55 and 45 percent respectively. From this clause of agreement, these forests have been known as Pachpan Paintalis forest

SOILS:

Soil is the mainstay of agriculture. In fact, the quality and texture of soils are the main factors which determine the use of land and the prosperity of inhabitants. Soils of the region are either residual or depositional in origin due to their genesis from the Vindhyan ranges. On the basis of physiography, soils of the region vary from the lowland drained by the tributaries of Yamuna to the upland of the Vindhyans. The soils of upland region
are less fertile and suitable for afforestation whereas the soils of low land are richer in fertility and suitable for agriculture.

The first soil survey of the region was conducted at Orch (Jalaun)\(^1\) to determine the regional classification of soils on the basis of mechanical composition. The main emphasis was laid on the fertility of soils and intensity of irrigation. On the basis of the survey, the soils are classified under four classes namely Mar soils, Kabar, Parwa and Rankar. (Fig 1.6a).

Roy Chaudhary\(^2\) has classified Bundelkhand soils on the basis of their morphological characteristics into two main groups i.e. Black soils and Red soils. Mar and Kabar soils belong to the first group. The second group of soils include Parwa and Rankar soils.

1. **Mar Soil**:

   It is a deep calcareous soil, predominantly blackish in colour. It is often called a 'Black Cotton Soil'\(^3\), which is formed as a result of decomposition or disintegration of the trap rocks. It is a fertile soil and is suitable for agriculture. In Banda, Jalaun and Hamirpur districts, the Mar soil occupies 16.3\%, 25.7\%, and 25% of cultivable land while in Jhansi and Lalitpur districts, this soil occupies 22\% of cultivable land. It is found in tahsil
of Both, Hamirpur and south-central part of Jalaun district. Elsewhere, it is found in small patches. The central part of Rath tahsil irrigated by Dhasan canal and central part of Lalitpur and Maharani tahsils are also characterised by small patches of this soil. It can be cropped continuously without manures owing to the higher proportion of organic matter. So, the areas of mar soils are prosperous in agricultural economy.

2. Kabar Soils:

It is similar to 'mar' in many respects and is found in various forms ranging from a rich dark black to a light brown. It contains alumina, ferre oxide, lime, magnese and organic matter. This soil is found in the low lying areas of Bundelkhand Region. In Jalaun, Hamirpur, Jhansi including Lalitpur and Banda districts, 30%, 23%, 22% and 27.8% of cultivable land is occupied by these soils respectively. This soil is distributed in low land areas of Maudaha, Hamirpur, Roth, Garautha, northern part of Mahanipur and south-central part of Jalaun district. It is highly fertile and suitable for the production of Gram, Jwar and Cotton. In the Patha area of Banda and Jhansi districts, poor qualities of mar and kabar soils are also found with low productivity.
3. **Parua Soil**:

Parua is a light coloured sandy soil, admixture of clay and sometimes of sandy loams. Chemically, it is poor in iron, lime, phosphate and nitrogen. Over irrigation is harmful on account of alkine content. It is well distributed along the riverine edges and shares 31% of culturable land in Hamirpur district. In Banda district it occupies 30% of culturable land along the bank of the Ken, Yamuna and Paisuni rivers. While in Jalaun and Jhansi districts, this soil occupies 21% and 20% of culturable land respectively. More or less, it is found in every tahsil of the region but its main areas are the tahsils of Mahoba, extreme south-western Rath, Kulpahar, northern Mauanipur, Garautha, Mot and Northern part of Jalaun district.

4. **Rakar Soil**:

Rakar is stony soil usually found on the sloping surface of the ravine land in Bundelkhand. It is coarse sand and deficient in organic matter and nitrogen. It is divided into 'Moti and Patli', the former representing deteriorated mar and kabar and the latter being excarnated light soil. In Jhansi, Banda, Jalaun and Hamirpur districts, the Rakar soil occupies 30%, 29%, 20% and 1% of the culturable land respectively. It is found along the banks of 'Nalas' in Mahoba tahsil and rocky edges in Lalitpur, Mahrauni and Jhansi tahsils. It is useful, where irrigation amenities are available.
Other soils like Soind, Bandi, Forest, Tarai including alluvial kakk red and yellow are also found in the region. But the area under these soils is small and negligible in comparison to the major soils. The percentage of these minor soils in all the districts of the study region is given in Table 1.3.

**Table 1.3**

<table>
<thead>
<tr>
<th>Districts</th>
<th>Percentage of minor Soils</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jhansi including Lalitpur</td>
<td>5.00</td>
</tr>
<tr>
<td>Banda</td>
<td>7.3</td>
</tr>
<tr>
<td>Jalaun</td>
<td>2.0</td>
</tr>
<tr>
<td>Hamirpur</td>
<td>2.0</td>
</tr>
</tbody>
</table>

**Erosion and conservation of Soils:**

Soil erosion is a serious problem in the study area due to undulating topography, high velocity of the streams, unconsolidated soil texture in the ravines Rakar and Parua soils. The area under active soil erosion in the region extends over about 30,0000 hectares of land. Hamirpur district accounts for the highest land (9,0000 hectares) under erosion (Fig. 1.6B) followed by Banda (8,000 hectares), Jhansi including Lalitpur (7,0000 hectares) and Jalaun (6,20000 hectares).

Conservation of soil is to protect it from the
erosion. At first, a soil conservation programme was launched during 1957-58 in the region. But some effective measurements for soil conservation were taken after third five year plan (1968-69) in the region. A progress of soil conservation in the region can be assessed from the following table (1.4) and Map (Fig. 1.6c).

**TABLE 1.4**

**PROGRESS OF SOIL CONSERVATION IN THE REGION**

<table>
<thead>
<tr>
<th>Years</th>
<th>Target in Lakh hectares</th>
<th>Achievement in Lakh hectares</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970-71</td>
<td>2.2</td>
<td>2.4</td>
</tr>
<tr>
<td>1973-74</td>
<td>2.5</td>
<td>3.5</td>
</tr>
<tr>
<td>1976-77</td>
<td>3.5</td>
<td>4.0</td>
</tr>
<tr>
<td>1979-80</td>
<td>4.6</td>
<td>4.7</td>
</tr>
<tr>
<td>1982-83</td>
<td>5.3</td>
<td>6.0</td>
</tr>
</tbody>
</table>

According to soil and conservation department Jhansi, about 18 Lakh hectares of land was reclaimed upto 1982-83 in the region. It is only 50% of the total land which is under erosion. While every year, a thousand of hectares of land is subjected to erosion. Hence both extensive and intensive programmes of soil conservation are needed for the region.

...
REFERENCES

6. Ibid, P. 27.