CHAPTER I
PHYSICAL FEATURES:

Location:

The area selected for study which is also referred to as 'region' forms part of the Sankhada and Jetpur-Pavi talukas of Beroda District of Gujarat State. It covers an area of 22,076.89 hectares (52 villages) of which 18,313.84 hectares (83.02 percent part of study area) are in Sankhada Taluka (44 villages) and 3,763.05 hectares (16.98 percent part of study area) are in Jetpur-Pavi Taluka (8 villages) or it forms 25.47 percent of Sankhada taluka and 4.70 percent of Jetpur-Pavi Taluka. It lies between latitude of 22° 4' north to 22° 11' north and longitude of 73° 38' east to 73° 51' east. It is drained by the river Haren in the south and the Unch river in the north (Map 1).

TABLE I Area of the study region:

<table>
<thead>
<tr>
<th>Area in hectares</th>
<th>% to the Gujarat State</th>
<th>% to the Beroda District</th>
<th>% to the Sankhada Taluka</th>
<th>% to the Jetpur-Pavi Taluka</th>
<th>% to the Study area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gujarat State</td>
<td>19,593,400.00</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Beroda Dist.</td>
<td>778,600.00</td>
<td>3.97</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sankhada Taluka</td>
<td>72,260.21</td>
<td>0.36</td>
<td>9.27</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Jetpur-Pavi Taluka</td>
<td>79,933.22</td>
<td>0.40</td>
<td>10.26</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Study area in Sankhada Taluka (44 revenue villages)</td>
<td>18,313.84</td>
<td>0.09</td>
<td>2.36</td>
<td>25.47</td>
<td>-</td>
</tr>
<tr>
<td>Study area in Jetpur-Pavi Taluka (8 revenue villages)</td>
<td>3,763.05</td>
<td>0.02</td>
<td>0.40</td>
<td>-</td>
<td>4.70</td>
</tr>
<tr>
<td>Total study area (52 revenue villages)</td>
<td>22,076.89</td>
<td>0.11</td>
<td>2.84</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Map showing villages of the Study area

Legend

- Taluka Boundary
- Village Boundary
- River
- Central Place Villages
- Village Location

Source: Baroda office, Heran Canal Project

Map: 1
Physiography

The average height of this region is 80 metres above sea level.

There are some hills which are of significance to the pattern of distribution of the villages in the area and their economic and social contacts. The Songir hill is 109.74 metres in height (Photo 1). The Dongapa hill forms part of the Songir ranges. These hills are rich in sandstone which are used for building purposes. The narrow gauge railway line between Chuchhapura and Trakhala was constructed in 1922 by the then Baroda State to give better accessibility to the quarries. The railway links Ghentol to the Songir quarry. The Leehhrea hill is 154.33 metres in height (Photo 2). The hills are covered with teak wood which is used in this region for agricultural implements and construction of houses. The hill consists of quartzites which were also used by early man to make stone implements. The Kanakuma hill has a height of 127.33 metres and lies to the south west of the Leehhrea hills. The other two knolls in the region are to the south of Veena and the Heren river (Lunadra and Sinhedra knolls). Both are of quartzite. Bhetpur village is located west of the Leehhrea hills where the hills make way for the open plain. The plain has an average height of only 80 metres. It broadens westwards and Bhetpur commands all the natural routes north and south of the Leehhrea (map 2).

Drainage pattern (map 2)

The area lies between two rivers. The Unch in the north and the Heren (map 1) in the south, which are the tributaries of the Garang river which later joins river Narmada. Both these semi perennial rivers flow from east to west and have sand deposits at number of places along their beds. River Heren joins River Garang near Bhilodia village while River Unch joins it near Sankhada. Both Konindra and Veena are situated on the banks of the Heren river. The number of


Sources: 1. Toposheet F 12/12816
Drainage pattern

Map: 2

Key:
- Hill
- River
- Kotar [gullies]
Kotars (Gullies (Photo 32) locally termed kotar) are more near the Unch river than in the vicinity of the Heren. Some of them are used by the villages as natural water channels for irrigating crops and are economically an asset. The Bhorda Kotar (Photo 26) is used for lift irrigation which contains pools of water, Kosindre, besides being on the river Heren, had the added facility of having the broad and deep Bhorda water, north of it, which provides the settlement with irrigation water in the winter season. The koter goes past Desan village as well, before merging with the Unch river near Serainda village. The Chucheli Kotar joins the Unch river near Chucheli. To the west of Lachhrai hills there are three main kotars viz Vegatha Kotar, Javuwan Kotar and Timbe koter. North of the Unch river there are four koters viz Vedola Chorangta koter, Timbi koter, Geherpura koter and Sundepure koter. Even though some of these koters contain water for irrigation purposes, they obstruct smooth transportation. In the monsoon season they become impossible (photo 32). Some of the bigger villages have constructed small culverts and bridges over these kotars. They have also build 'Kharist' (sandstone rubble road) over these kotars which join the heren at the Lunadra koter and Parveta koter. They join the river from the south.

Geology (Map 3)

Geologically the area has some patches of Deccan trap, Champaner series, Bagnhads. But the recent deposits cover most of the area. The rocks of Champaner series are younger than the archean crystalline rocks. The rocks of this series consist of quartzitic. It is found north of Lachhrai village. It consists entirely of whitish, bluish white or gray flaggy quartzites. The Sonar Indral have well bedded quartzites. Just near Padwan village, outcrops of quartzitic sandstone are visible in the bed of the Heren. These outcrops are also seen along the bed of the river Heren near the village of Ramsari, Indral Songir and Vaena. They extend further south to Lunadra. The two knolls of Lunadra and Sinhadra are of quartzitic. The rocks are white

Source: The geology of Beroda State R.B. Foota
and gray. They are quarried to a small extent to be used as baking plates and are also locally used as wall stones. Two patches of Deccan trap series are seen in the beds of the Horan, the first one is at Vasna exposed in the form of small hummocky. These rocks are of basalt. The second is a tiny patch forming an outlier on the top of the bigh beds crust near Sinhadra village. The beds the calcareous sandstones are seen in the bed of the Horan river between Un and Nevagam and towards Raj Vasna. Patches of this formation are seen north and east of Lachheras and another patch at Vasna. Sandstone quarries are also seen on the left bank of the river in Songir, which are used by the railways. It is also used for making grinding stones, rubble for the building of houses and roads. These sandstones are worked by the people of Songir Indral villages, and have long been a valuable resource of this region. In the western part of the quarry, the stone is white and was largely quarried in former years. In the central part reddish or brownish stones were quarried in 1892. Many of the gritty beds are brown or even purplish coloured and thin bedded and these are quarried largely for purposes of making hand millstones for Bhatpur, Vasna, Kosindra and other villages of this region since very early times.

Soils : (Rep 4)

The study area has three main types of soil. They are (1) Black Soil, (2) Besar (Red loamy) and (3) Sandy soil.

(1) Black Soil : Most of the soil of this region is black soil, which is very fertile. This black soil known as 'Black Cotton soil' is highly argillaceous with 62% or more of clay. It contains no gravel or coarse sand. It is highly retentive of moisture but exceedingly sticky in the monsoon, giving to considerable contraction on drying large and deep cracks are formed during the dry season in summer, through which water seeps during the monsoon. Cotton is one of the main crops of this region, because the black soil is best suited for its cultivation. The soil of sub regions of Bhatpur is black while that of Kosindra and Vasna has Besar and Black.
(2) **Basar Soil**: This soil is found in one fourth part of Kosindra village and one third part of Vaana. The entire area north of the Unch river has basar soil. It supports good crops of cereals, pulses and groundnuts, near Vaana, Kosindra and Chikhodra. Bananas are now cultivated with the help of irrigation.

(3) **Sandy Soil**: Patches of sandy soil are seen near the quartzitic hills. They are infertile. On both sides of Heran river some patches of sand are seen, while some Gozat (soil having sand with red loam) soil also occurs along with the sandy patches.