CHAPTER - 2

GEORGAPHICAL FEATURES OF THE STUDY AREA
Geographical personality of the study area with its constituents like relief, drainage, soil, climate etc. plays a vital role in shaping the pattern and level of development of an area. Therefore, it is quite useful to provide a brief account of the salient features comprising geographical background of the area under study as a prelude to explain its type and level of socio-economic development.

**Location And Extent: -**

Karauli district located in the south-eastern region of Rajasthan lies between 26° 3’ north to 26° 49’N latitude and 76° 35’E to 77° 26’E longitude. The height for the sea level in the district 400 to 600 meters, and total area of district is 5070 squire km. It is bounded on the East by Dhaulpur district, on the North-East Bharatpur district, on the North-West Dausa district and on the South-West Sawai Madhopur and on South-East M.P state is present respectively. Chambal river separating the Karauli and Morena district (M.P. state). Administratively, the district comprises 6 tahsils
(Karauli, Todabhim, Hindaun, Nadauti, sapotra and Mandrayal), the development blocks have not present in district, 793 villages and 9 urban centres

**Geological Structure:**

Karauli is a land locked district bounded by Dausa, Dhaulpur, Sawai Madhopur, Bharatpur district and the Madhya Pradesh state. It extends over in the south-eastern part of Rajasthan and falls in parts of survey of India topo-sheets nos. 54/B. Physiographically, the district is characterized by the northern extension of the great Vindhyan Plateau covering the south-eastern part of the district.²

Geologically, the terrain comprises pre-Cambrian metamorphic igneous and sedimentary rocks belonging to pre-Arvallis Vindhyas. Alluvium and soil primarily confined to the vicinity of the Chambal, Moral, Gambhir, and Banas Rivers cover the area between the Great Boundary Fault and the Lalsot hill ranges.³

Pre-Arvalli rock units comprising quartzites, micaschists, gneisses and migmatities cover the north-
western part of the district between Sapotera and west of Bayana. These rock units are uncomfortably overlain by quartzites and metavolcanics of Alwar. Formation of the Delhi Group. Rocks of Gwalior Formation comprising interlayered sequence of banded haematite jasper, quartzite. Limestone and intrusive delerite and occurring in east and south-east of Hindaun have been grouped under pre-Aravalli rock units on the basis of stratigraphy and structure.4

The different rock units of Karauli district show evidence of superposed deformation. The earlier major folds on north-east-south-west (NE-SW) to north-north-east-south-south-west (NNE-SSW) axial plane have been affected by secondary fold system on north-north-west south-south east (NNW-SSE) to north-west-south-east (NW-SE) and south-east axial plane.

An alternate succession of sandstone and shale with intervening carbonate phase and their associated primary structures of Vindhyans reveal a shallow marine environment of deposition with signs of mild tectonism. Similarly, the alternate sequence of quartzite and
phyllites within Delhi’s essentially reflects stable shelf tectonic frameworks of sedimentation with alternate period. The quiescence and movement is fallowed by similar tectonic episode of greater entenrities.5

Drainage System: -

The following are the main river of the district—

Gambhir: -

It emerges from the hills in Nadauti tahsil. It flows through the upper Hindaun and lower Todabhim tahsils flowing in the district for about 42km and then passes to Bharatpur district river Churahao, after flowing in Todabhim tahsil, joins river Gambhir. It leaves the district near village Pali. River Churahao, after flowing in Todabhim tahsil, joins it. Other villages on its bank in the district are Katkar, Samet, Kandrah, Saikhpur, Ankhera, Mudanpur, Lipaopli, Salempur, Tigrria, and Deor besides Pali. The banks of the Gambhir are clearly defined in clay and Kankar soil and are much cut up by nullahs. The whole of the drainage of area of
the hills to the west of Hindaun, from Todabhim as far as Khera, falls into this river (Fig 2.2)

The Morel: -

It is a tributary of Banas. It rises in the hills near Dhuli in Jaipur district. It is joined by the river Dhund and onwards by Khari River. The Khari River rises in Todabhim and Lalsoot ranges of hills, about 15 km north of Bamanwas and after flowing south ultimately joins the Morel.

The Banas: -

It rises in the hills near Saimar in the Aravalli range, to the west of Udaipur and enters Karauli district south and for a short distance forms the boundary with Tonk district. In the hot months the riverbed is dry but it becomes treacherous after the rains. The banks are well defined and the river is on an average 30 ft. deep. The Banas river in Karauli flows in easterly direction till it receives the Morel river coming north-east and then goes south and finally meets the Chambal river at Rameshwargha in khandar tahsil. The Banas forms a common boundary between sub-divisions of
Karauli and Sawai Madhopur and its length in the district is nearly 106km. Village on the banks of Banas are Raipur, Barar, Kundel, Devalda, Goti, Baroda, Samoti and Hadoti.

**Chambal: -**

The river Chambal forms the border between this district and the state of M.P on the south-eastern portion it enters the district near village Karamapura and after flowing for nearly 84km Leavels it near village Saherh. Its bed is sandy and rocky and the Morel and the Banas are its important tributaries in the district. Village falling on its banks in the district are Banghera, Kachhi, Gunwala, Gota, Simath and Dans.

The rivers and streams in the district are very helpful in increasing the supply of sub-soil water in wells by percolation.

**Lakes And Tanks: -**

There are no natural lakes in the district though tanks are numerous. The water from these tanks is used
for irrigation purposes and drinking water for animals and for domestic use. Before in the formation of Rajasthan, there were about 90 small irrigation tanks in the area constructed during erstwhile Jaipur district. After the formation of Rajasthan, six important minor and medium irrigation projects have been constructed in this district. There are Juggar in the Hindaun tahsil, Panphna, Mamchari Tal and Naga Tal in Karauli tahsil, Khirkhiri Tal in Sapotra tahsil and Needer Tal in Mandrayal tahsil.

**Ground Water Resources:**

The Ground water Department, Rajasthan, and Jodhpur have conducted a fairly detailed survey of ground water in different tahsil in Karauli district. According to this survey, the main source of ground water is alluvium of quarternary age. Besides this, the sandstone-limestone of Vindhvan system also forms aquifers that yield moderate discharge. The depth of water level varies from less than 3-25 metres in various parts of the Karauli district. In the Karauli district, the water level
ranges from 5 to 25 metres in the centre region while in the northern portion it ranges from 7 to 14 metres. Waters level in the eastern poration is from 5 to 18 metres.

Ground water in this district has in general, very low-to-low salinity with minimum concentration in alluvium and limestone, while it is slightly higher in slates and phyllites. They water in general is suitable both for irrigation and domestic purpose. The ground water survey has revealed existence of unusual potentiality of ground water resources. In tube-wells and open wells drilled in Karauli district by the Ground Water Department, the quality of water is sweet and the yield varies from 1000 to 4000 gallons of water per hour.

Soils:

The general texture of the soils in the district ranges from deep medium heavy and black grayish dark drown soils to deep yellowish brown soils. There are four main types. Soils found in Bamanwas and parts of Gangapur
DISTRICT KARAULI
SOIL TYPES
PERCENT

HEAVY AND BLACK GREYISH TEXTURED YELLOWISH BROWN
HEAVY TEXTURED AND BLACK TEXTURED AND DARK BROWN
LIGHT TEXTURED YELLOWISH BROWN

FIG 2.3
and Swai Madhopur Panchayat Samities are deep medium to heavy textured and black, grayish or dark brown in colour. Todabhim, Hindaun and small part of Panchayat Samiti areas have deep light textured yellowish brown soils, while soils found in parts of Karauli, Sapotra tehsil and parts of Panchayat Samities are shallow to very shallow light brown. In parts of Karauli and Sapotra Panchayat Samitis, there are ravines caused by Chambal. (Fig 2.3)

Physical Divisions: -

The district looks like triangular in its general shape and is one of the eastern districts of Rajasthan. The area of district under study has been divided in to four physical divisions- (1) Moral Basin (2) Gambhir basin (3) Upper Chambal Basin and (4) Banas Basin.

(1) Moral Basin: -

Moral river is a tributary of Banas. It rises till the district boundary of Dausa towards western parts
and Bharatpur towards eastern parts. It has comprises Padampura Tal.

(2) Gambhir Basin: -

Gambhir river emerges from the hills in Nadauti Tahsil. It flows through the upper Hindaun and lower Todabhim Tahsil flowing in the district for about 42Km and then passes to Bharatpur district river Churahao. Gambhir basin has Kalma Tal, Jagar Tal, Nagal Tal, Panchna and Mamchari Tal.

(3) Upper Chambal Basin: -

The river Chambal forms the border between this district and the State of M.P. on the south-eastern portion it enters the district near village Saherh. Upper Chambal Basin has only Neethar Tal and natural resources.

(4) Banas Basin: -

It rises in the hils near Saimar in the Aravalli range, to the west of Udaipur and enters Karauli district south and for a short distance forms the boundary with Tonk district. The Banas river in Karauli
DISTRICT KARAULI
PHYSICAL DIVISION

FIG 2.4
flows in easterly direction till it receives the Moral river coming north-east. The Banas forms a common boundary between sub-divisions of Karauli and Sawai Madhopur. Banas Basin area has Tatwara and khirkhiri Tal and also natural vegetation. (Fig. 2.4)

Climate: -

The district has a dry climate except during the short rainy season. December to February is the cold season. The hot season is from March to about the third week of June. The rainy season, which follows, lasts till about the third week of September. The period from about the third week of September to the end of November constitutes the transition season.

Temperature: -

There is only one recently started meteorological observatory in the district at Karauli. Hence, in the following description the meteorological records of the observatories in the neighboring districts which provide a fair idea of the
temperature and other meteorological conditions that prevail in the district have also been taken into account. The period from March to June is one of continuous rise in temperature May and the first half June being the hottest part of the year. The mean daily maximum temp. In May is about 45.55°C and the mean daily minimum temp. Is about 25°C (Table 2.1)? Night temp. In June are little higher than May. The maximum temp. In May and June, may, on individual days, go unto about 47°C (Table 2.1). The setting in of the south-west monsoon by about the third week of June lovers the temp. Somewhat but relief from teat is not marked because of the added discomfort from increase in humidity brought in by the south-west monsoon air. After the withdrawal of the monsoon by about the third week of September, days become hotter and in October a secondary maximum day temp. Is recorded. The nights become progressively cooler. Both day and night temp. Drop rapidly after mid-November till January, which is the coldest month, with a mean daily maxi. Temp. Of about 23°C and a mean daily minimum of about 3°C. In association with cold waves which sometimes affect the district in the wave of western disturbances
Table 2.1 – Average Maximum and Minimum Diurnal Temperature (°C) 1980-99

<table>
<thead>
<tr>
<th>MONTHS</th>
<th>JAN.</th>
<th>FEB.</th>
<th>MAR.</th>
<th>APR.</th>
<th>MAY</th>
<th>JUN.</th>
<th>JUL.</th>
<th>AUG.</th>
<th>SEPT.</th>
<th>OCT.</th>
<th>NOV.</th>
<th>DEC.</th>
<th>AVERAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAXIMUM</td>
<td>22.46</td>
<td>23.41</td>
<td>30.11</td>
<td>32.33</td>
<td>43.55</td>
<td>49.17</td>
<td>38.30</td>
<td>33.00</td>
<td>30.73</td>
<td>30.14</td>
<td>25.28</td>
<td>24.78</td>
<td>32.10</td>
</tr>
<tr>
<td>MINIMUM</td>
<td>03.00</td>
<td>08.17</td>
<td>11.15</td>
<td>15.62</td>
<td>19.22</td>
<td>20.53</td>
<td>22.06</td>
<td>23.01</td>
<td>22.14</td>
<td>18.25</td>
<td>12.58</td>
<td>08.27</td>
<td>15.34</td>
</tr>
<tr>
<td>AVERAGE</td>
<td>12.23</td>
<td>15.79</td>
<td>20.63</td>
<td>23.97</td>
<td>29.88</td>
<td>34.82</td>
<td>30.18</td>
<td>28.00</td>
<td>26.43</td>
<td>24.19</td>
<td>18.88</td>
<td>16.52</td>
<td>23.46</td>
</tr>
</tbody>
</table>

Source-Director Office, Indian Meteorological Centre, Jaipur
passing north India during the cold season, minimum temp. Particularly, in January and February, May go drown to a degree or two below the freezing point of water.

**Humidity:**

Relative humidities are generally over 60% during the south-west monsoon during the rest of the year the air is dry. The driest part of the year is the summer season, when the afternoon relative humidity may be as low as 10 to 15%. *(Table 2.2)*

**Winds:**

Winds are generally tight to moderate with some strengthening in force in the summer and early south-west monsoon season. Winds blow mainly from the westerly and south-westerly directions during the south-west monsoon season. In the post-monsoon and winter months, winds are mostly from directions between west and north. In the summer season, the winds blow from directions between south-west and north-west.
Table 2.2 – Relative Humidity (%) at 8.30 A.M and 5.30 P.M

<table>
<thead>
<tr>
<th>Time</th>
<th>JAN.</th>
<th>FEB.</th>
<th>MAR.</th>
<th>APR.</th>
<th>MAY</th>
<th>JUN.</th>
<th>JUL.</th>
<th>AUG.</th>
<th>SEPT.</th>
<th>OCT.</th>
<th>NOV.</th>
<th>DEC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.30 A.M</td>
<td>75</td>
<td>65</td>
<td>50</td>
<td>35</td>
<td>30</td>
<td>35</td>
<td>67</td>
<td>75</td>
<td>70</td>
<td>67</td>
<td>67</td>
<td>66</td>
</tr>
<tr>
<td>5.30 P.M</td>
<td>42</td>
<td>35</td>
<td>25</td>
<td>20</td>
<td>22</td>
<td>30</td>
<td>55</td>
<td>67</td>
<td>66</td>
<td>65</td>
<td>60</td>
<td>61</td>
</tr>
<tr>
<td>AVERAGE</td>
<td>58.50</td>
<td>50.00</td>
<td>37.50</td>
<td>27.50</td>
<td>26.00</td>
<td>32.50</td>
<td>61.00</td>
<td>71.00</td>
<td>68.00</td>
<td>66.00</td>
<td>63.50</td>
<td>63.50</td>
</tr>
</tbody>
</table>

Source: Director Office, Indian Meteorological Centre, Jaipur
Rainfall: -

Rainfall records in the district are available for 6 existing station functioning for fairly long periods and also for 5 stations closed at present. One station namely Nadhoti have in the district, but their data is for too short a period for climatologically use (Table 2.3) give rainfall, figures at the six stations and for the district as whole. The average annual rainfall in the district is 671.88mm. The rainfall during the period June to September constitutes about 56.51% of the annual rainfall. Variation of rainfall from year to year large. In the 50 year period from 1951 to 2001 the highest annual rainfall, amounting to 209% of the normal occurred in 1968, while the lowest annual rainfall, which was only 30% normal occurred in 1962. In the 50-year period the annual rainfall of the district was less than 80% of the normal during 15 years. There was one occasion each of two, three and four consecutive years of such low rainfall in the district as a whole. Considering the rainfall at individual stations it is seen that at some station rainfall was less than 80% of the normal even unto five consecutive years. The period 1972 to 1976 was
DISTRICT KARAULI

(A) TEMPERATURE

(B) HYTHORGRAPH

(C) CLIMOGRAPH

(D) RAINFALL

FIG 2.5
<table>
<thead>
<tr>
<th>Centres</th>
<th>JAN.</th>
<th>FEB.</th>
<th>MAR.</th>
<th>APR.</th>
<th>MAY</th>
<th>JUN.</th>
<th>JUL.</th>
<th>AUG.</th>
<th>SEPT.</th>
<th>OCT.</th>
<th>NOV.</th>
<th>DEC.</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hindaun</td>
<td>9.9</td>
<td>4.1</td>
<td>6.9</td>
<td>49.3</td>
<td>218.9</td>
<td>227.1</td>
<td>107.4</td>
<td>14.0</td>
<td>107.9</td>
<td>16.0</td>
<td>3.6</td>
<td>6.1</td>
<td>4.8</td>
</tr>
<tr>
<td>Karauli</td>
<td>10.9</td>
<td>7.3</td>
<td>5.3</td>
<td>4.1</td>
<td>10.4</td>
<td>53.3</td>
<td>241.1</td>
<td>243.6</td>
<td>107.9</td>
<td>15.0</td>
<td>3.8</td>
<td>3.3</td>
<td>4.7</td>
</tr>
<tr>
<td>Mandrayal</td>
<td>10.9</td>
<td>6.6</td>
<td>5.6</td>
<td>4.8</td>
<td>6.9</td>
<td>9.0</td>
<td>237.2</td>
<td>227.6</td>
<td>97.8</td>
<td>18.3</td>
<td>3.8</td>
<td>5.8</td>
<td>708.6</td>
</tr>
<tr>
<td>Saputra</td>
<td>9.9</td>
<td>7.9</td>
<td>6.1</td>
<td>4.6</td>
<td>8.9</td>
<td>6.8</td>
<td>260.1</td>
<td>245.1</td>
<td>105.9</td>
<td>14.7</td>
<td>3.1</td>
<td>6.1</td>
<td>741.2</td>
</tr>
<tr>
<td>Todabhim</td>
<td>10.9</td>
<td>6.1</td>
<td>1.1</td>
<td>2.8</td>
<td>8.1</td>
<td>65.8</td>
<td>188.0</td>
<td>178.6</td>
<td>100.3</td>
<td>15.5</td>
<td>0.3</td>
<td>7.4</td>
<td>589.4</td>
</tr>
<tr>
<td>Nadauti</td>
<td>9.1</td>
<td>6.1</td>
<td>5.3</td>
<td>3.8</td>
<td>6.6</td>
<td>51.6</td>
<td>227.1</td>
<td>223.3</td>
<td>100.8</td>
<td>15.2</td>
<td>3.1</td>
<td>4.8</td>
<td>656.8</td>
</tr>
<tr>
<td>Average</td>
<td>10.26</td>
<td>6.71</td>
<td>5.91</td>
<td>3.91</td>
<td>7.96</td>
<td>56.51</td>
<td>228.73</td>
<td>224.21</td>
<td>103.35</td>
<td>15.61</td>
<td>3.0</td>
<td>5.7</td>
<td>671.88</td>
</tr>
</tbody>
</table>

Source: Rajasthan District Gazetteer, Sawai Madhopur
one of generally low rainfall in the district as a whole though in varying degrees in the different parts of the district. It will be seen from table 2.3 that the annual rainfall in the district was between 500 and 900mm. (i.e. within 25 to 30% of the normal) in 31 years out of fifty.

On an average, there are 35 rainy days (i.e. days with rainfall of 2.5mm. or more) in a year in the district. The heaviest rainfall in 24 hours recorded at any station in the district was 360mm at Karauli tahsil on August 11, 1972.

**Hill System:**

Karauli district lies on the eastern slope of the Aravalli ranges, which run from north-east to south-west, almost across the entire Rajas than state, dividing it naturally into two parts. The Aravallis in the district are mostly found in the northern, western and southern parts, which comprise Hindaun, Mandrayal and Karauli sub-divisions. The total hill area of Karauli District is 27.33, which is distributed tahsilwise, viz, Sapotra (54.28%), Mandrayal (50.08%), Karauli (38.47%),
Nadauti (12.92%), Hindaun (2.88%) and Todabhim (5.35%) respectively. The south-west portion of the district has many ranges of low hills. In the region of Karauli subdivision, hills become somewhat higher and more extensive, making the terrain, especially in interior, hillier and in some places not easily approachable. Hills and broken ground characterize almost the whole territory, which lies within a tract locally termed as Dang, a name given to this rugged region. In karauli Tahsil, ravines intersect hills. These hills consist chiefly of granite and sandstone, occasionally mixed with white and black marble and mica. They are said to be primitive rocks belonging to the transitional series, as they do not contain any fossil remains. The principal hill ranges are in the northeastern portion of the district where several ranges run along or parallel to the northern border, forming somewhat formidable barriers.

The slopes of the hills are gentle and these are wooded. Along the valley of the Chambal River, irregular and lefty walls of rocks, separate the lands on the bank
eagle, the honey buzzards and they lesser owls. There are also found tree-pies, fly catchers, cuckoo-shrikes, minivets, cuckoos, the coucal, green pigeons woodpeakers, barbets, grey horn bill, doves and paraects of different varieties.
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