



## *CHAPTER - 2*

## *STUDY AREA*

## **2.0 STUDY AREA**

Vadodara district, situated in eastern Gujarat, is the twelfth largest district, having 7,788 sq. km. accounting for 3.97% of the total geographical area of the state (Anon, 1980).

Vadodara district lies between latitude 21° 45' and 23° 00' and longitude 72° 45' and 74° 30'. It is bounded on the northern side by the Panchmahals & by Dahod districts, on the northwest by Kheda & Anand districts, separated by the Mahi River, on the south & south-west by Bharuch & Narmada districts, on the east by Madhya Pradesh State and on the south-east by the Dhulia district of Maharashtra State.

### **2.1 Physical and Cultural Background**

The ancient town of Vadodara was once called 'Chandanvati' after the name of Raja Chandan of the race of Rajputs, who wrested it from the Jains. The Chandanvati or the 'City of Sandalwood' was afterwards changed to Viravati or the 'Abode of Warriors', and then again to Vatpatra or 'Leaf of the Vad Tree'. Now 'Vatpatra' has been modified to Vadodara.

### **2.2 Geology**

The major portion of the western part of Vadodara district is covered by a thick pile of alluvium. Detailed stratigraphic and structural studies in the recent years have now resulted in the subdivision of the metasediments of this region into "Champaner Series" by two older sequences.

The Champaners themselves are divided by the Jaban conglomerate horizon into lower and upper. The lower Aravalli folds

trend north northwest - south southeast while the upper Aravalli fold axes trend east northeast - west southwest to northeast-southwest.

There are two main rock types in the area, viz. the cretaceous sedimentary sequence of the Nimar-Bagh age and the succeeding volcanic intrusive belonging to the Deccan trap suite.

The Infratrappean rocks (Nimar-Baghs) occurring as elongated outcrops in the Narmada valley, around Khandia in the North and elsewhere in the district are considered to be the marine equivalent of Lametas (fresh water) found in Madhya Pradesh. They comprise intercalated sequence of pebbly conglomeritic sandstone and fossiliferous limestone with shale intercalations.

The Deccan trap suite of rocks comprises basic and acidic lava flows and associated dykes and sills, which occur as intrusives into lava flows. Important exposures of the Deccan trap suite or rocks occupy the southern and southeastern parts of the district around Pheniamata, Ambadungar, Kawant, Mohan Fort, etc. The Deccan traps in these areas form comparatively rugged topography.

### **2.3 Minerals**

The useful minerals and rocks found in this region are calcite, base metals like lead-zinc as well as dolomite, limestones, quartzites, sandstones, etc. which are used as materials for building and constructions. There are also minerals like feldspar, fluorspar, glass sand & quartz, graphite, manganese, ochres and oils. Among these the fluorspar deposit at Ambadungar in Chhota Udepur taluka is the largest in the world. Also the oil deposits at several places in the alluvium-covered area of the district indicates petroliferous strata of the Tertiary age.

## **2.4 Soil**

The district has various types of soils i.e. deep black, cotton black soil, besar, goradu, alluvial, sandy loam, undulating and hilly soils. Sandy soil with varying proportions of loam, colour, texture, structure and composition is commonly found. In hilly areas, it is generally very shallow and the soil is poor in nutrient status. In some pockets of low-lying areas and valleys, the soil is good and deep. Black soils are found in the southern and southeastern parts and the goradu in the northern parts of the district. The forest area has continuous soil erosion because of less vegetal cover due to less regeneration, as there is excessive grazing, fires and many other reasons.

## **2.5 Climate**

### **2.5.1 Rainfall**

The rainfall in the district increases generally from the west towards the east. About 95% of the monsoon rainfall is received from June to September, July being the month with the most rainfall. The annual rainfall varies greatly from year to year.

### **2.5.2 Temperature**

From March to May the temperature rises steadily. The day temperatures in May are the highest, being about 40.5° C (104.9° F). The heat, particularly in the latter part of the summer season, is intense and on individual days, temperatures may go up to about 45° C (113° F).

With the onset of the monsoon early in June, there is an appreciable drop in the day temperatures but the nights are as warm as during the summer. After the withdrawal of the monsoon, towards

the end of September, there is slight increase in day temperatures and a maximum in day temperatures is reached in October. However, the night temperature decreases after the withdrawal of the monsoon. After mid-November, both day and night temperatures decrease rapidly till January, which is the coldest month. The mean daily maximum temperature in January is 30.1° C (51.1° F). The district is sometimes affected by cold waves.

### **2.5.3 Humidity**

During the southwest monsoon season, relative humidity is high, generally exceeding 70%. During the rest of the year, the air is dry. The driest part of the year is the period from February to April with relative humidity less than 30% in the afternoons.

### **2.5.4 Cloudiness**

Skies are generally heavily clouded or overcast in the southwest monsoon season. Cloudiness rapidly decreases in the post-monsoon season. Skies are mostly clear or lightly clouded during the months from December to May.

### **2.5.5 Winds**

Winds are generally light with some increase in force during the late summer and early part of the southwest monsoon season. Winds blow mostly from the southwesterly and westerly directions during the period from May to September. Winds blow from the north or northeast during the post-monsoon and early winter months. In the latter half of the cold season and the first two months of summer, winds are mostly from directions between southwest and northwest.

## **2.6 Physical features**

Vadodara district forms a part of the great Gujarat plain. The eastern portion of the district comprising the Chhota Udepur, Jabugam (Pavijetpur) and Naswadi taluka is hilly while the rest of the district is plain and undulating.

## **2.7 Water resource**

- Surface water
- Ground water

### **2.7.1 Surface water**

The Narmada and the Mahi are the chief rivers of the district. Besides these two rivers, many of its tributaries and subtributaries flow through the district and empty into the Gulf of Cambay (Khambhat). The Mahi - Narmada doab is situated between Mahi and Narmada and is well known for its black soil, which is suitable for production of cotton. This doab covers the Vadodara plain, which is watered by the tributaries of the Narmada, Mahi and Dhadhar. The River Vishwamitri is a dividing line between black soil regions. They present a desert-like appearance when not cultivated, whereas the red loam regions are cultivated throughout the year.

Tributaries and subtributaries of Narmada River flow in the present study area. It is the largest river not only in the Vadodara district but also in Gujarat State. It has as many as 15 tributaries and subtributaries in this district. Some of its tributaries flowing in this district are the Orsang River, the Uchh River, the Heran River and the Men River.

### **2.7.2 Ground water**

In spite of irrigation facilities, wells remain the major source of water supply. Due to erratic rainfall in the area, many tanks and

reservoirs dry up, causing acute scarcity conditions in the area. Adequate supply of water may be obtained from shallow bore wells.

## **2.8 Agriculture**

Agricultural development gained considerable momentum in the district after the accession of the late Maharaja Sayajirao of Baroda. It was since then that an essentially subsistence agriculture turned into a commercial one and the crops instead of being raised for domestic needs of the family began to meet the requirements of the markets. The most important of the commercial crops was cotton, which began to be cultivated.

Among non-food crops, cotton is the most important cash crop in terms of area and total value of sale. The district is the largest producer of cotton and the second largest producer of pigeon pea in the state. The general standard of raising cotton is better than that of food crops. The area under tobacco plantation has also increased and cultivators now pay more attention to tobacco, as it is an important cash crop.

The main kharif crops in the district are paddy, pigeon pea, maize, bajri, cotton, groundnut, tobacco, banana, vegetables and jowar. The rabi crops are wheat, gram and potatoes. The summer crops include bajri, jowar for fodder, sugarcane, etc. The kharif crops being the principal crops, always occupy a much larger area as compared to the rabi and summer crops. However, the area under these three types of crops varies from year to year depending upon the season and irrigation facilities.

## **2.9 Forests**

The district's forest cover is meager. The major portion of the area of the district is plain. Vadodara district has tropical dry deciduous forest type.

The total forest area of the district is about 6.4% of the total area as against 9.84% area of the state. Forests are on the eastern border and south hilly region of the district covering Chhota Udepur, Naswadi and Pavijetpur talukas. The forest tract of the plain is undulating with broken ranges of hills of height ranging from 105mts. to 633.67 mts. above mean sea level. The slopes of the hills range from moderate to steep at places.

The Chhota Udepur division of the Vadodara Circle governs forests in the district.

### **2.9.1 Past System of Management of Forest**

Prior to 1907, the main aim of the state was purely for revenue generation. So, good utilizable trees were exploited, leaving behind unsound trees. A separate forest department was formed but no efforts were made to demarcate the forests. Later on, as a result of the advice of the political agency, efforts were made to classify the forests as also to bring them under some sort of systematic working through working plans and schemes.

From 1907 to 1943, the forests were repeatedly worked on a short coppice rotation varying from 10 to 20 years. During this period, revenue generation was the prime consideration rather than monitoring principles of silvicultural management. This resulted in exploitation of the forest resources in this area. In 1943, D.B. Rushi prepared a working scheme, which prescribed simple coppice on 40 years rotation. But this plan also failed. In 1949, the entire forest



administration was placed under the revenue department. A provisional five years working scheme was prepared by Shri M.V.Divedar, BFS, that contained a list of coupes to be felled annually as also a list of coupes to be thinned under an improvement scheme. In 1951, R.I. Patel drew up a provisional scheme. The objective was to restock the area; the areas were classified according to the suitability of the sites. The species were prescribed accordingly. From 1961, Jadhav's scheme came into force, dividing the forest areas into three different working circles i.e. Selection, Babul & Main working circles. The selection cum improvement working circles and main working circle has 30 years of felling cycle. The babul working circle had a clear felling followed by artificial regeneration.

## **2.10 Forests of the study area**

The study area has basically two categories of the forest type: Tropical dry deciduous i.e. Dry deciduous teak forest and Dry deciduous mixed forest. The forest areas included under this plan are distributed over 300 villages of 5 talukas of Vadodara district and are mostly confined to the hills. Towards the eastern side, the forests are more compact while in the west, they are scattered. Plate 1 shows the study area.

Rangewise distribution of the area is given in Table 11. The present study has been conducted in the Kalarani and Sajwa round of Pavijetpur range and the Boriad round of Boriad range. The Kalarani round has three beats viz. Kalarani, Karali and Chhotanagar, having 42 compartments and a total area of 192 sq. km. The Sajwa round consists of 5 beats -- Sajwa, Chalamli, Kavra, Bordha & Degala -- with 128 compartments and total area of 183 sq. km. The Boriad

round covers about 169 sq. km. of an area having four beats i.e. Boriad, Sengpur, Vagach and Gatasha, with 43 compartments.

**Table 11: Distribution of the Forest Areas in Chhota Udepur division**

Sr.No.	Ranges	Reserved (hectares)	Protected (hectares)	Unclassed (hectares)	Total (hectares)
1	Chhota Udepur	10523.9	122.57	0	10646.48
2	Dolariya	8071.63	0	0	8071.63
3	Rangpur	7633.03	148.82	1188.41	8970.26
4	Kawant	10228.3	0	240.5	10468.76
5	Pavi Jetpur	13187.3	0	129.57	13316.85
6	Naswadi	3528.78	0	5554.42	9083.2
7	Boriyad	4338.11	0	2857.36	7195.47
8	Panvad	6537.22	283.2	0	6820.42
9	Vadodara	5076.96	0	0	5076.96
10	Tilakwada	954	0	10	964
	TOTAL	70079.2	554.59	9980.26	80614.03
*Forest areas of Tilakwada to be subsequently transferred to Narmada District under Rajpipla East Forest Division.					

Plate 1: Map showing Study Area

