CHAPTER II:

STUDY AREA

2.0 Description of the Study area:

Vadodara district is one of the most important districts of Gujarat. It is a leading agriculture district and one of the main contributors to the agricultural production in the state.

2.1 Geographical Location:

Vadodara District is a district in the eastern part of the state of Gujarat in western India. It lies between latitudes 21° 45’ and 22° 45’ North and longitudes 72° 48’ and 74° 15’ East having a geographical area of 7,550 km². The district is bounded by Panchmahal and Dahod districts to the North, Anand and Kheda to the West, Bharuch and Narmada districts to the South, and the state of Madhya Pradesh to the East. Administratively, the district is subdivided into twelve talukas, viz. Vadodara,

Karjan, Padra, Savli, Dabhoi, Sankheda, Waghodia, Jetpur Pavi, Chhota Udepur, Naswadi, Tilakwada and Sinor.

In the present work, part of Vadodara district is selected as a site of the study area which includes portions from Vadodara, Padra, Dabhoi and Waghodia talukas. Site of study area is shown in map given below (**Figure 4)**.

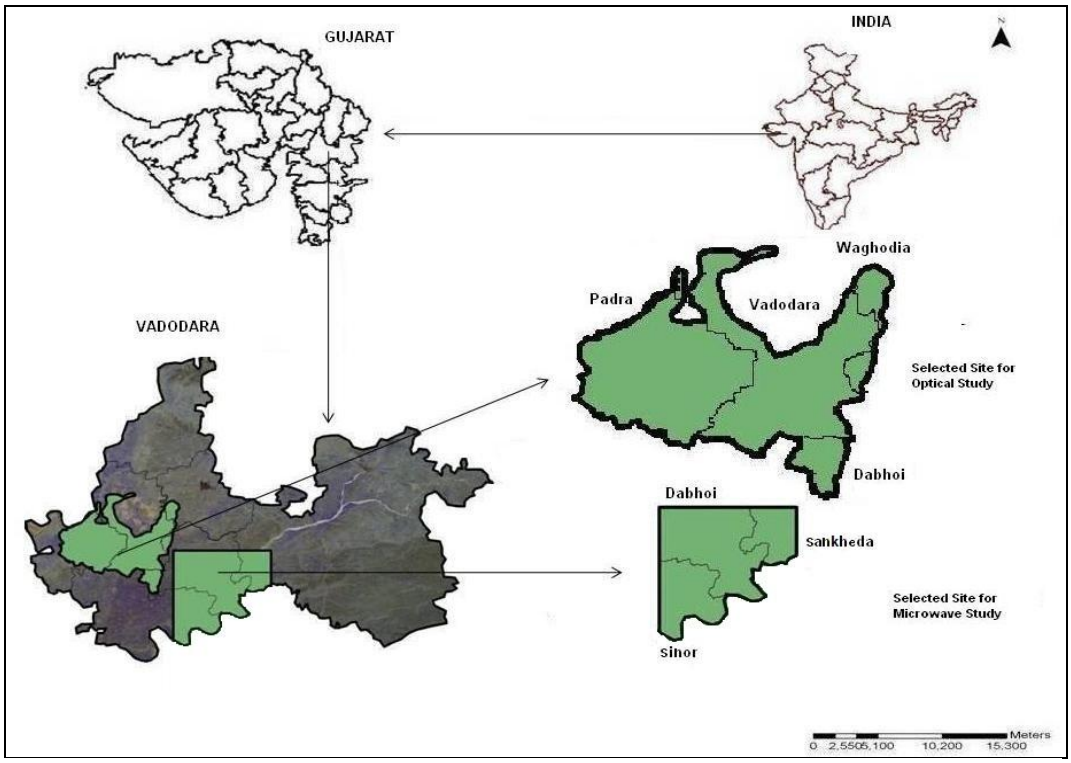

Fig 4. Map showing site of study area

The Mahi River passes through the district. Orsang, Dhadhar, Dev, Goma, Jambuva, Vishwamitri, Bhukhi Heran, Mesari, Karad, Men, Ani, Aswini and Sukhi are the small rivers. Minor irrigation dams are constructed across Sukhi and Rami rivers. Geographically, the district comprises of Khambhat Silt in the south-west, Mahi plain in the north-west, Vadodara plain in the middle, Orsang-Heran plain in the mid-east, Vindhyan hills in the east and Narmada gorge in the south-east which merges westwards

with the lower Narmada Valley. Most of the area of the region is represented by flood plains having general slope towards the Khambhat Gulf on the South-west.

2.2 Land Utilization Statistics:

In the district, it is noteworthy that about 68% of the total geographical area is under cultivation which emphasizes that the district is one of the important agriculture districts of Gujarat State. Out of twelve talukas, eight have about more than 70% of their geographical area under cultivation. However, the coverage of forest area is only 4% and pasture land forms 5 % of the geographical area. **Figure 5** depicts land utilization statistics of the district.

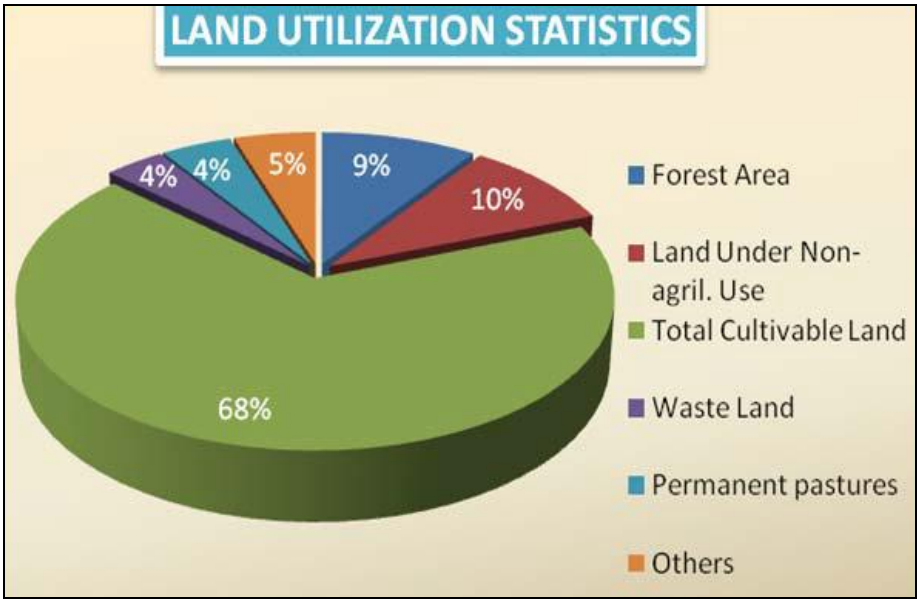

Fig 5. Land Utilization Statistics (Source: Final District Agriculture Plan (DAP): Vadodara)

2.3 Geology:

In the district, the area of Vadodara, Karjan, Padra, Dabhoi and Sinor talukas fall under alluvium formation while part of Savli and Waghodia talukas comprise of rocky

formation. Sand, silt, clay, kankars and gravels form the alluvium. Major part of the district is covered under alluvial soil which is very fertile and thus soils of the district are suitable for agriculture.

2.4 Soil

In general, the soils of the Vadodara district are Medium black to Black (**Figure 6**). Taking into consideration different soil fertility indices, the district has the soil which in general is neutral. Electricity conductivity of the soil in the district is medium. Soil contains low content of organic carbon and nitrogen. Phosphorus and Potash content in the soil is medium and high respectively. Thus, on overall, as far as point of view of agriculture is considered, the soil fertility indices are average.

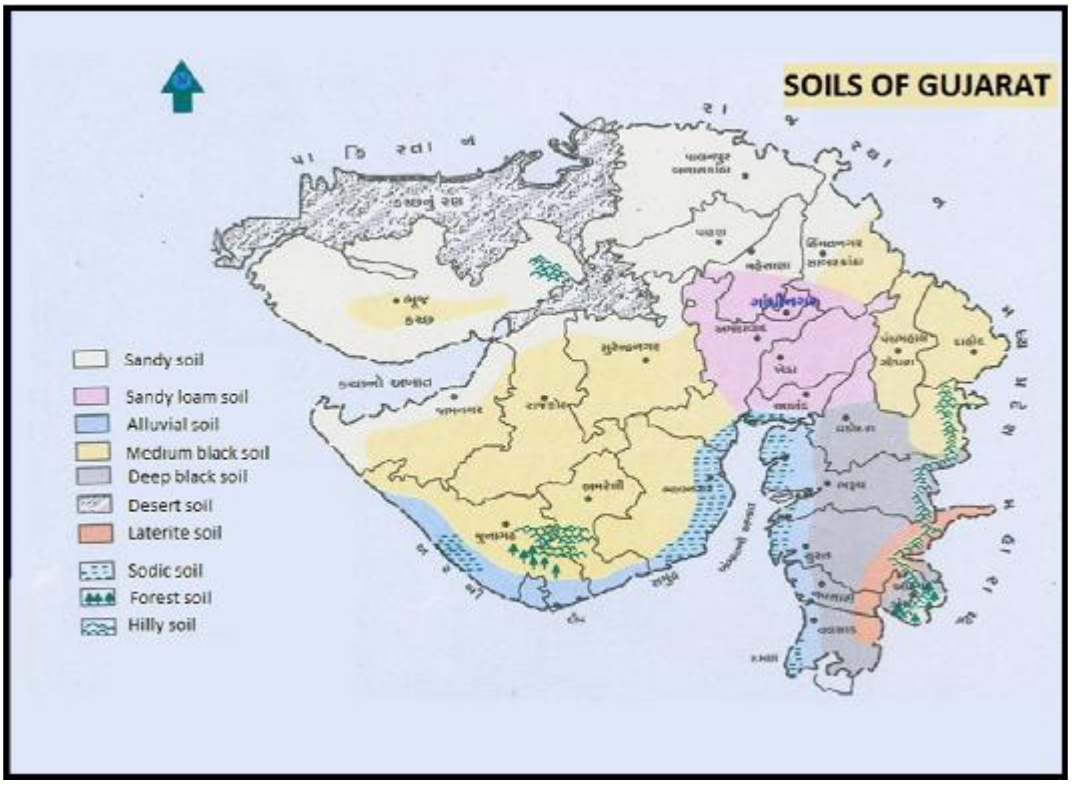

Fig 6. Soil map of Gujarat State (Source: Agriculture Contingency Plan for District: VADODARA)

2.5 Climate:

Generally, the climate of Vadodara district during a major part of the year is characterized by a hot summer and humidity. During winter season, it is never too cold in the district with temperature remaining over 10 degrees. January is the coldest month of the year, with the mean daily maximum and minimum temperatures of 30.1^{o}C and 10.8^{o}C respectively. It is hot in the period from March to October with temperatures hovering over 35 °C, with little respite during monsoon in June, which lasts till the end of September. May is the hottest month of the year with the mean daily maximum and minimum temperatures of 40.7^{o}C and 26.1^{o}C respectively. During last ten years, the average rainfall has been recorded in the range of 1000 mm (**Figure 7**). Months of October and November are considered as the post monsoon.

Based on Indian Meteorological Department (IMD) data it is observed that predominant wind direction during winter season (October to April) is from North-east and North-west directions, whereas during summers, wind blows mainly from West and South-West directions. The general weather conditions are conducive to good agriculture harvest (both Kharif and Rabi harvest).

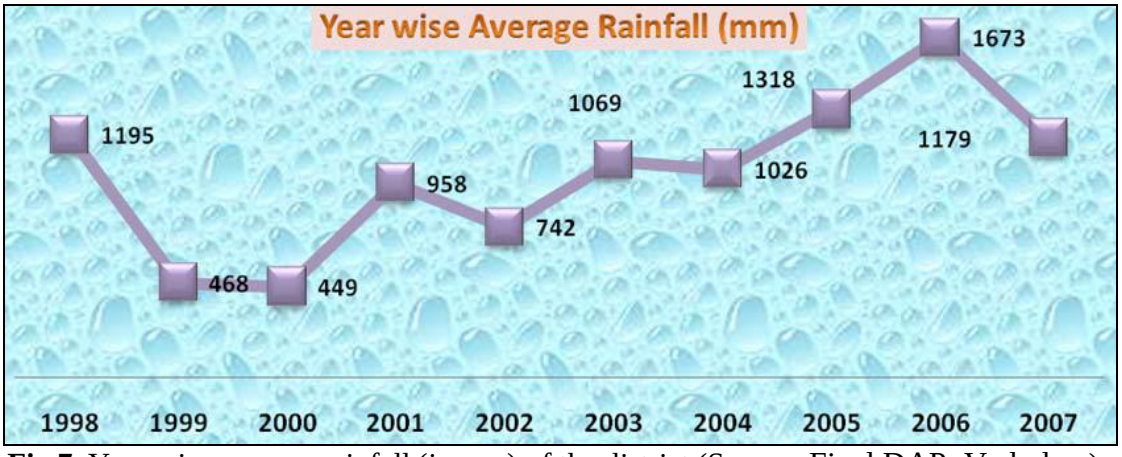

Fig 7. Year wise average rainfall (in mm) of the district (Source: Final DAP: Vadodara)

2.6 Water management/Irrigation practice

The agriculture is said to be, "the gambling of the monsoon" as it is controlled by monsoon rainfall which at several times are uncertain, irregular and uneven or unequal. Total annual rainfall in the district occurs in three or four months, i.e. from June to September. Thus irrigation for crop production during the rest eight months becomes very essential.

Out of total cultivated land of Vadodara district, 48% of land are irrigated and the remaining land (52%) is non-irrigated one (**Figure 8**). The important sources of irrigation for crop production are open/bore wells/tube wells as 83% of irrigation in irrigated lands is done by Open well and Bore well/tube well (**Figure 9**).

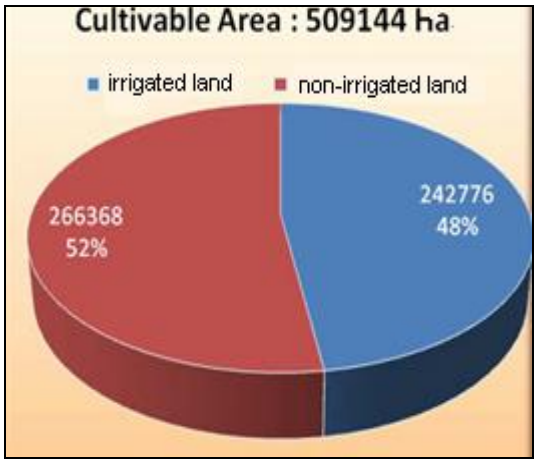

Fig 8. Irrigated/Non-irrigated Area

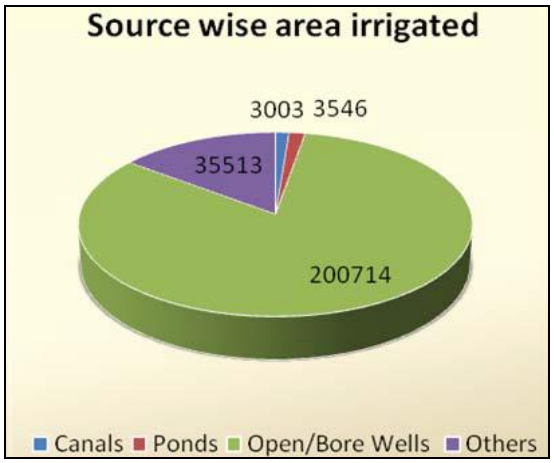

Fig 9. Source wise Area Irrigated

(Source: Final DAP: Vadodara)

2.7 Agriculture:

In Kharif season, crops like Paddy, Cotton, pulses, and Maize are grown over an area of 4,24,359 ha. In the district, Cotton occupies around 40% of area under Kharif crops (**Figure 10**). Four main Rabi crops namely Wheat, Tobacco, Sugarcane and Maize are grown over an area of 69,059 ha which covered 79% of the total cultivated Rabi area

(87,151 ha). Wheat and Sugarcane are the main crops covering around 45% of an area under Rabi crops (**Figure 11)**. In Summer Season mainly crops like groundnut and Bajri are grown.

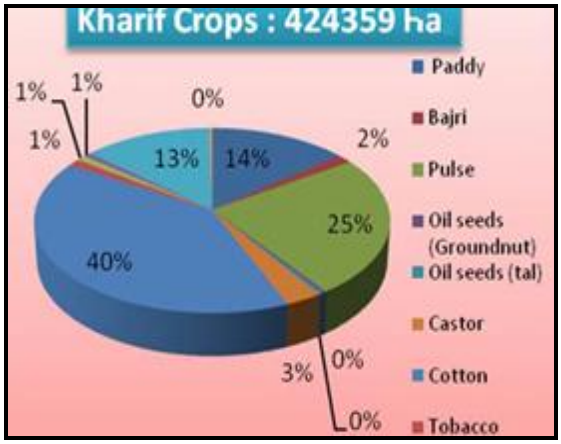

Fig 10. Area under Kharif Crops

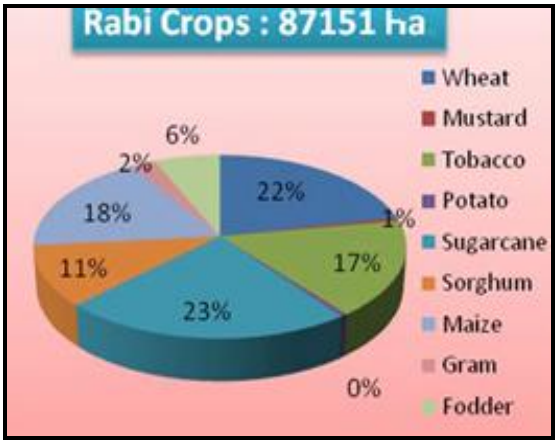

Fig 11. Area under Rabi Crops

(Source: Final DAP: Vadodara)

Total area under food grain cultivation was calculated as 2,41,600 ha in 2005-06 in Vadodara. Vadodara district is known to be the largest producer of pulses in the state, contributing 14.7% to the total crop production. The district is counted among major fruit producing districts in Gujarat, contributing 11.25% to the total fruit production. In the state, it is a major cultivator of flowers that contributes 17.65% to the total production. Of this total percentage, Mogra (33.8%) Marigold (18.3%) and Rose (14.2%) contribute a substantial share.

The district is one of the highest contributors for the total banana production in the State (14.2%). It is also largest producer of Brinjal in Gujarat (12.6% to total production of the state). District is ranked second in production of Gauva (22.6%), Okra (13.4%), Tomato (12.7%) and Turmeric (16.8%). In addition, it stands third in production of papaya (9.7%) and custard apple (15.3%). It is among the four districts in Gujarat producing cashew nuts.

2.8 Livestock Population

Main cattle in the district are cows and buffalos. Population of cow stands at 4,44,671 and buffaloes, 3,85,583 in the district **(Figure 12)**. Significant poultry population are seen in the district (i.e. 3,36,964 birds). Goat and sheep are the other domestic animals found. The number of cows and buffaloes in the district highlights the potential for production of organic manures and promotion of organic farming in the district. However convincing farmers to use organic manure is not an easy task. For this, at first the advantages of using organic manures and practice organic farming in long term perspective should be brought to the notice of farmers.

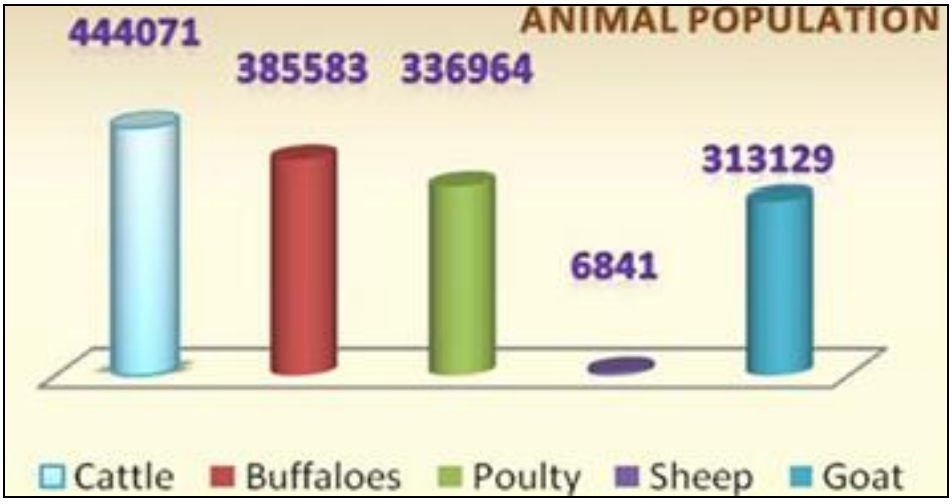

Fig 12. Livestock Population of the district (source: Final DAP: Vadodara)