1. REGIONAL SETTING

1.1. INTRODUCTION

Ahmedabad City Taluka region, the biggest leading industrial and commercial area of Gujarat, astronomically lies between 22º56' to 23º01' North latitudes and 72º30' to 72 º 41' East longitudes along the bank of Sabarmati River. The region is well connected by rail, roads and airways with all the important cities of the state and that of the country (Plate 1.1 and 1.12). Ahmedabad is the seventh largest city of the country and according to recent expansion spreads in an area of 582.84 sq. km and accommodates 44,87,348 people. Apart from its central position in the heart of Gujarat, Ahmedabad City Taluka region in the past enjoyed a strategic importance in view of its location on the main highway to Rajputana and Malwa regions on one hand and to Saurashtra Peninsula on the other. After the bifurcation of ex-bilingual Bombay state in May 1960, Ahmedabad remained the capital of Gujarat till Gandhinagar, a newly planned capital town at a distance of 24 sq. km in the year 1970 became functional. Ahmedabad is now a district headquarter and many state-level and district level offices are located in the city. The city is agglomerated with the surrounding towns and villages of Daskroi taluka. The city limits were expanded in 2006 and many surrounding villages and semi urban areas were merged within the Municipal Corporation. The geographical location of the study region has constantly been favourable for its expansion and development.

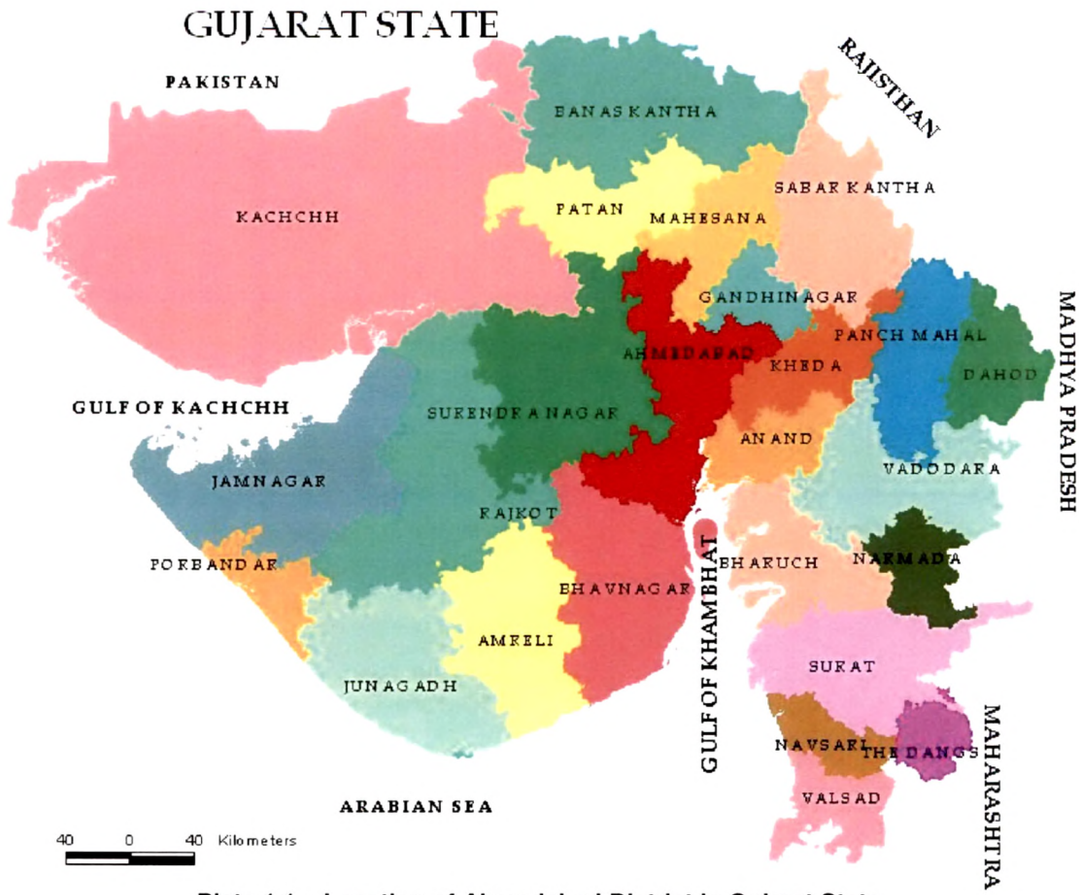

Plate 1.1 – Location of Ahmedabad District in Gujarat State
Source: BISAG, Gandhinagar

1.2. HISTORY

King Karandev–1, the Solanki Ruler, had waged a war against the Bhil king of Ashapall or Ashaval. After his victory Karandev established the city called Karnavati. This Hindu kingdom of Karnavati retained its significance till early 15th century when Gujarat fell to the Muslim Sultanate. This was when Sultan Ahmad Shah conquered Karnavati in 1411 A.D (Plate 1.2).

If legends are to be believed Sultan Ahmed Shah was astonished to see that the rabbits on the riverbank, instead of running away in terror confronted his hounds in defiance. Believing the land to be sanctified he laid the foundation of Ahmedabad - **The city of Ahmed** at 1.20 PM on Thursday the second day of jilkad A.H. (26th Jan 1411 A.D.)

The city enjoyed the status of a royal capital for a period of about 162 years, (1411-1573 A.D.) till the independent Sultanate of Gujarat came to an end in reign of Murzaffar-III.

Plate 1.2 – Ahmedabad Through Ages: 1411 A.D.
Source: 60, Gillion, K. L., 1968

As regards the location of the three towns of Ashaval, Karnavati and Ahmedabad, Ferguson comments: Modern investigation has not yet proceeded sufficiently far to enable it to be stated with certainty how far Karnavati was contiguous to or identical with Ashawal and Shreenaggur, both of which names occur in early records as those of a great city, but there can be no doubt that the new town of Ahmed Shah, to which he gave the name Ahmedabad and in due course of time this area became the part of the study region.

Ahmedabad was built in an open and spacious plain in the immediate vicinity of Ashaval to the east of Sabarmati. It then comprised of a smaller town now known as the Bhadra Fort or the Citadel of Bhadra. Other

structures were gradually added to its territory from time to time. The city was enclosed by a fort wall of 10 km in the circumference containing 12 gates, 189 bastions and over 6000 battlements in 1487 by Mohammed Begdo, the grandson of Ahmedshah, to protect the city from the invaders. It according to the ancient Indo-Aryan tradition of a royal capital was planned with main roads, thoroughfares and subsidiary roads.

Under the fostering care of the Sultans of Gujarat, the city of Ahmedabad went on expanding in every direction with the addition of new localities and suburbs, on both sides of the river, and gradually rose into a well built city, with well-laid-out residential as well as market areas and were beautified by palaces, mansions, mausoleums and mosques of reservoirs (lakes) and gardens erected by the noblemen of the sultans as well as by wealthy merchants of the Capital.

However the condition of the province became chaotic in the period of Sultan Muzaffar III. Akbar, the great Moghul Emperor, initiated the Gujarat expedition and conquered it in 1573. Though Ahmedabad lost its importance as the capital of Gujarat during Moghul reign but shortly it regained its importance as one of the thriving centres of trade in the country and leading city of Gujarat. The author of **Haft-Iqlim** (1593) refers to its fame as a grand and flourishing center of commerce and industry in the following words, *Ahmedabad is unique in the whole of India in matter of neatness and flourishing conditions, and it is superior to other cities in the excellence of its monuments. It would not be an exaggeration to express that in the whole world there exists no town so grand and beautiful. Its streets are spacious and well planned, unlike those of other towns. The shops are housed in two or three storied finely built buildings, and its*

residents both men and women are graceful and delicate in their appearance.

The Moghul rulers that followed Aurangzeb were weak and the Moghul viceroys (Subas) were busy fighting amongst themselves and with the Marathas. In 1753 the combined armies of Raghunath Rao and Damaji Gaekwad took the citadel and brought an end of Mughal rule at Ahmedabad.

During the Maratha regime, Ahmedabad was divided into two halves, one into the hand of Peshwa and the other into the hands of Gaekwad, the jurisdiction exercised by the Peshwa being greater. The condition of Ahmedabad, during the 64 year long Maratha rule went from bad to worse owing to the constant infighting between Peshwa and Gaekwad and the retrograde and oppressive policies pursued during this period. During this period of decline and insecurity that characterized 64 years of Maratha rule, suburbs were deserted, palaces and mansions reached to ruinous state, roads in hopeless state of disrepair, and the fort wall that enclosed the city had fallen off at several places. The area outside Panchkuwa and Delhi gates was reduced to wilderness visited by wild animals like Tiger, which was hunted in the third decade of the 19th century in the mosque at Mirzapur.

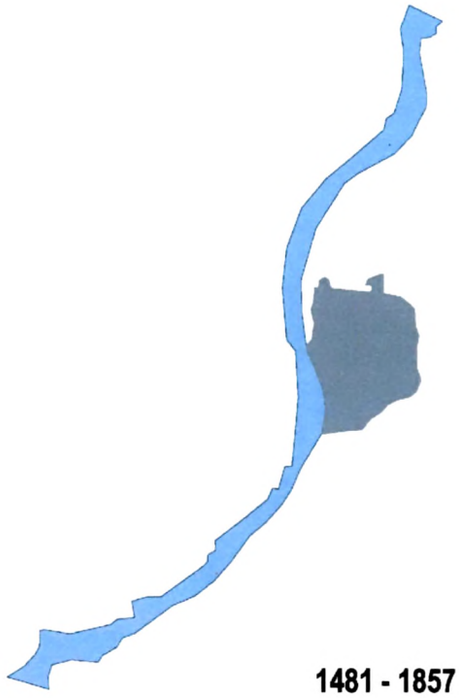

Plate 1.3 – Ahmedabad Through Ages: 1481 - 1857 A.D.
Source: 60, Gillion, K. L., 1968

It was in 1818 when the British took over the administration of Ahmedabad and brought the benefits of peaceful and orderly administration. Ahmedabad gradually started regaining its glory. The population of the city, which has gone down to 80,000 in 1817, gradually start increasing. Cantonment was established in 1824. Thereafter Municipal Committee was formed in 1834 and regular Municipal administration was introduced in 1858 (Plate 1.3). The railway link between Ahmedabad and Bombay was established during the year 1864. Thus, with the induction of such welfare activities and amenities of public interest, the spirit of Ahmedabad was awakened and was expressed in all walks of life (Plate 1.3). After a lapse of another century, Ahmedabad played an outstanding role in the country's struggle for freedom under the leadership of Mahatma Gandhi who on return from South Africa in 1915 came here and established his famous Ashram on the banks of Sabarmati (Plate 1.4).

Plate 1.4 – Ahmedabad Through Ages: 1900
Source: 60, Gillion, K. L., 1968

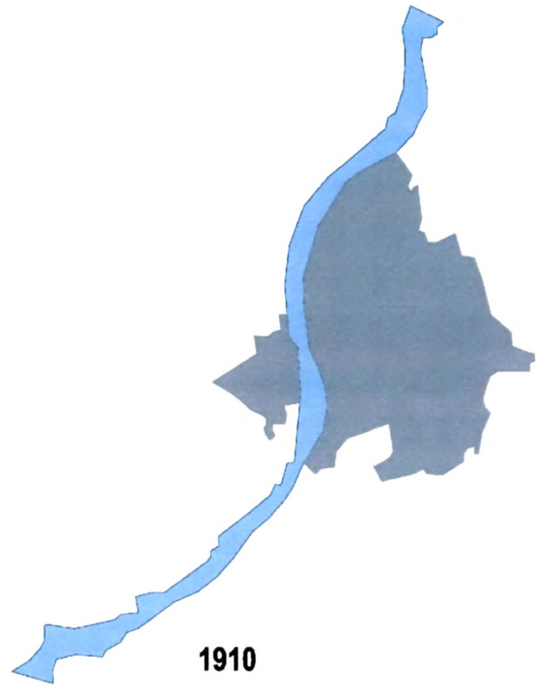

Plate 1.5 – Ahmedabad Through Ages: 1910
Source: 60, Gillion, K. L., 1968

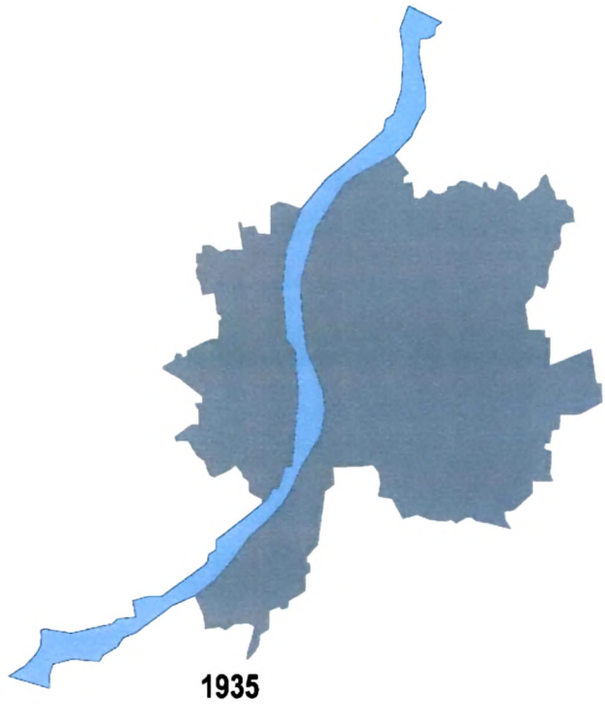

Plate 1.6 – Ahmedabad Through Ages: 1935
Source: 60, Gillion, K. L., 1968

Today, as the region under study, Ahmedabad has emerged as a unique city for its harmonious blends with a vibrant present. Ahmedabad is a model city in terms of its ideals and aspirations. What is remarkable about Ahmedabad is its harmony between art and industry, between a reverence to the past and a vision for the future. This too has influenced the transformation of its rural areas with the expansion of urban territory (Plate 1.5, 1.6 & 1.7).

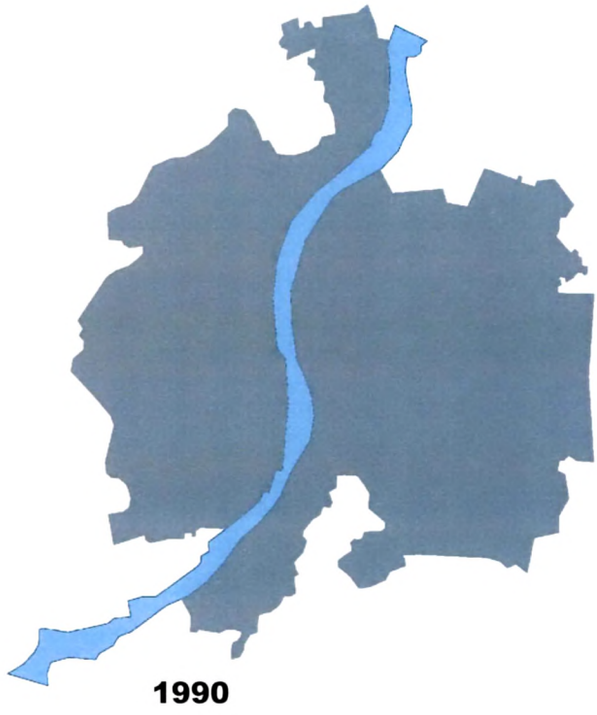

Plate 1.7 – Ahmedabad Through Ages: 1990
Source: 60, Gillion, K. L., 1968

1.3. GEOLOGY

Geologically, the region falls in the alluvial tract of Ahmedabad district and comprises mostly of Quaternary thick alluvium and brown sand (Table 1.1). Ahmedabad City Taluka, the study region lies close to the Dudhpur fault line. The part of the study region falls under the Platform cover and folded cover classification of the Peninsular shield Tectonic Framework (Table 1.2).

The major part of region is covered by stratographic position of recent and sub recent alluvium formations. The region is level to very gently slopping with average height of 48.77 metres above the mean sea level and due to this sedimentary alluvium is mainly derived from various rocks viz. Deccan trap, Quartzite, Granite, Sand Stones, impure Calcarious faces metamorphic and argillaceous rock like Slates, Schist and Phyllite and Conglemarate Besalt. Depositions are also found due to rain water run off

along with fine soil particles from hilly area to flat areas helped in the formation of heavy textured soils. Land Capability is high in region. However, the agricultural land in the region has a medium agricultural use due to its speedy conversion to non-agricultural uses.

Table 1.1 - Soil Series according to Physiography and their merger in final established Soil Series

Physiographic Unit	Originally identified soil series during soil survey	Finally merged series after correlation
Alluvial Plain	Kathalal (Ktl)	Kathalal (Ktl)
	Oganaj (Ogn)	Oganaj (Ogn)
	Silaj (Slj)	Balva (Blv)
	Ranodar (Rnd)	Kapuri (Kpr)

Source: Reconnaissance Soil Survey Report of Ahmedabad District; Technical Bulletin; Department of Agriculture, Nadiad; October 1998

Table 1.2 - Taxonomically Soil Classification of Identified Soil Series in the Region

Name of Soil Series	Soil Family	Sub Group	Great group	Sub order	Order
Kathalal (Ktl)	Coarse loamy, deep mixed, calcarious hyperthermic, flaventic, Ustochepts	Fluveritic Ustochrepts	Ustochrepts	Ochrepts	Inceptisols
Oganaj (Ogn)	Coarse loamy, deep mixed, calcarious hyperthermic, flaventic, Ustochepts	Fluveritic Ustochrepts	Ustochrepts	Ochrepts	Inceptisols
Balva (Blv)	Fine loamy, deep mixed, calcarious hyperthermic, flaventic, Ustochepts	Fluveritic Ustochrepts	Ustochrepts	Ochrepts	Inceptisols
Kapurai (Kpr)	Fine loamy, deep mixed, calcarious hyperthermic, flaventic, Ustochepts	Fluveritic Ustochrepts	Ustochrepts	Ochrepts	Inceptisols

Source: Reconnaissance Soil Survey Report of Ahmedabad District; Technical Bulletin; Department of Agriculture, Nadiad; October 1998

The region is classified under Alluvial Plains which have high ground water potential and high infiltration rate (Plate 1.8).

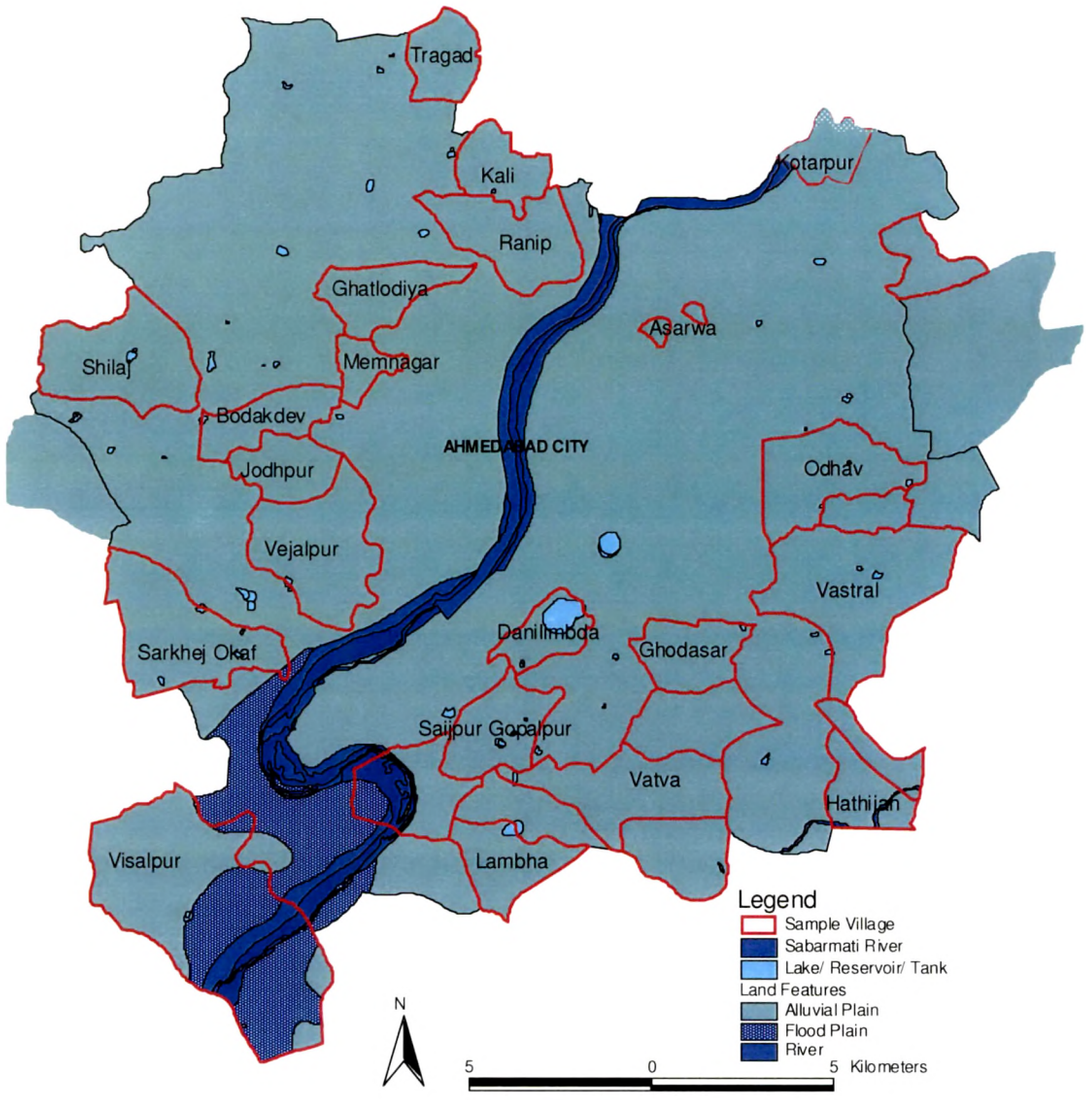

Plate 1.8 – Ahmedabad City Taluka Region: Geology
Source: Prepared from Base Map, BISAG, Gandhinagar

1.3.1. NON-METALLIC MINERALS

The river Sabarmati is the main source for the supply of sand, kankar and gravel. The brown coloured alluvial formation of the recent and sub-recent age on a very large scale is used for the making of bricks widely used in the construction activities.

1.3.2. OIL DISCOVERED

Oil and gas has been discovered in the study region. 8 wells have been drilled in the Ahmedabad Structure of the region. One of these well is oil bearing, 3 gas bearing and two remain dry, while two wells still have to be tested conclusively.

1.4. PHYSIOGRAPHY

The region lies in Alluvial plains specially towards Northeast and West. Topography is flat and the height varies from 46.63 to 50.93 meters above the Mean Sea Level (MSL) and is with average of 46.63 meters MSL. General slope is from Northeast to Southwest and the region is not endowed of hills and hillocks with varying gradient. The relief of the whole area is normal to sub normal. The region can be classified as the area with low Physiography (Plate 1.9). The Direction of the slope is almost parallel to the flow of the river Sabarmati. A few elevation points are observed in Western Ahmedabad, specially near Thaltej Tekra, Jodhpur Tekra, Gota and Vastrapur. Mostly the slope is less than 3 per cent; hence the region can be treated as flat area with very less significance of slope. The sea is at a distance of 80.65 km at the Gulf of Khambhat. Another chief natural feature is the spreading bed of Sabarmati River, which stretches through out the area from one end to the other end. Below the city on the left bank of the river and also midway between it and the Khari has few small rises, but, everywhere else the surface of the ground is unbroken on every side, except in the north, with groves of various trees.

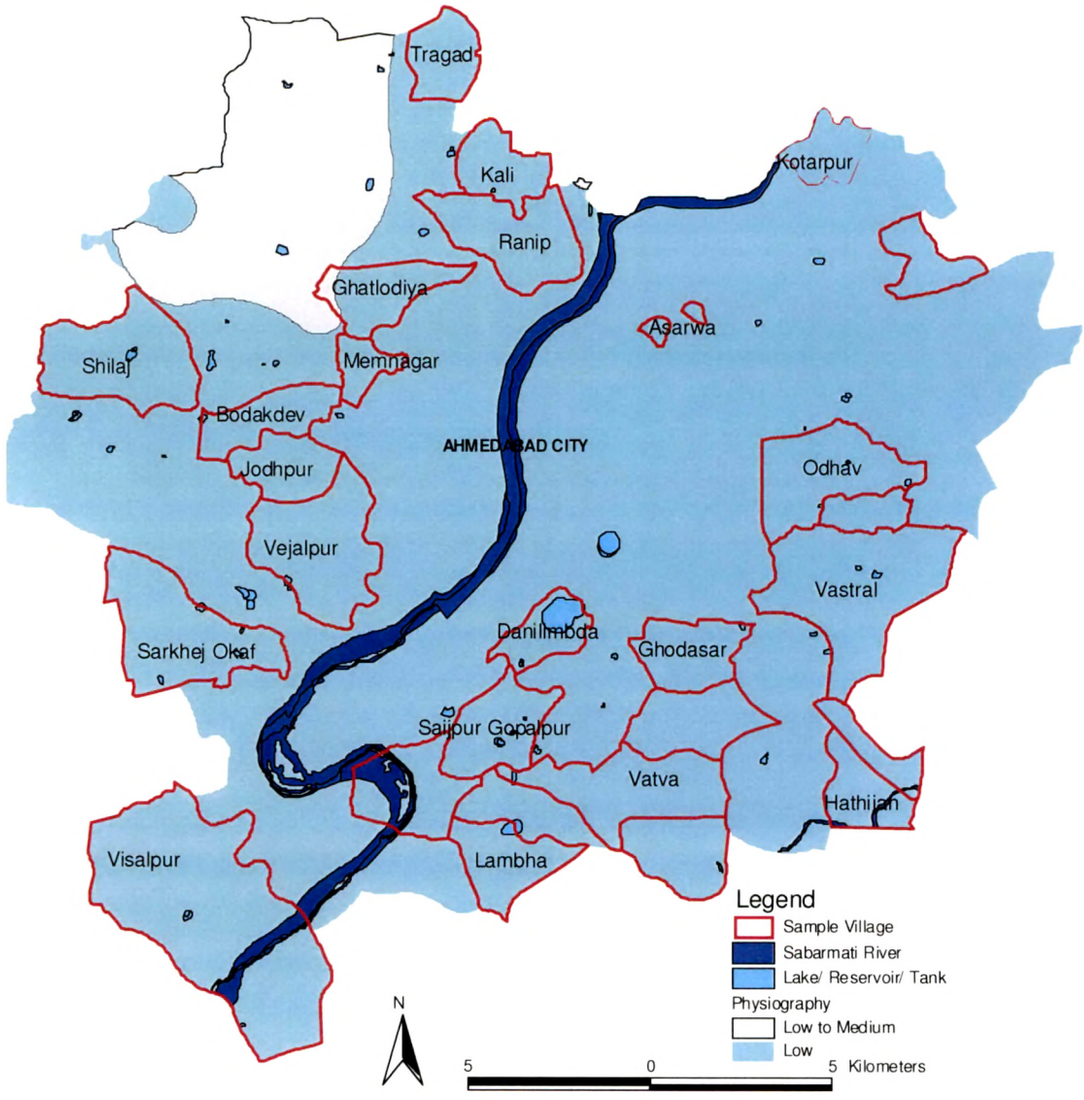

Plate 1.9 – Ahmedabad City Taluka Region: Physiography
Source: Prepared from Base Map, BISAG, Gandhinagar

1.5. DRAINAGE SYSTEM

The drainage pattern is dendritic to sub dendritic in Gulf of Khambhat. Sabarmati, one of the longest rivers of Gujarat, bifurcates the study region into Eastern and Western parts, connected by five bridges, two of which are constructed after independence (Plate 1.10). Though the river is perennial but it gets practically dried up in the summer, leaving only small stream of water flowing feebly. River Kharicut is the other river which flows

through the region. The major irrigation project of Fatehwadi is being used for irrigating the agricultural fields of the region.

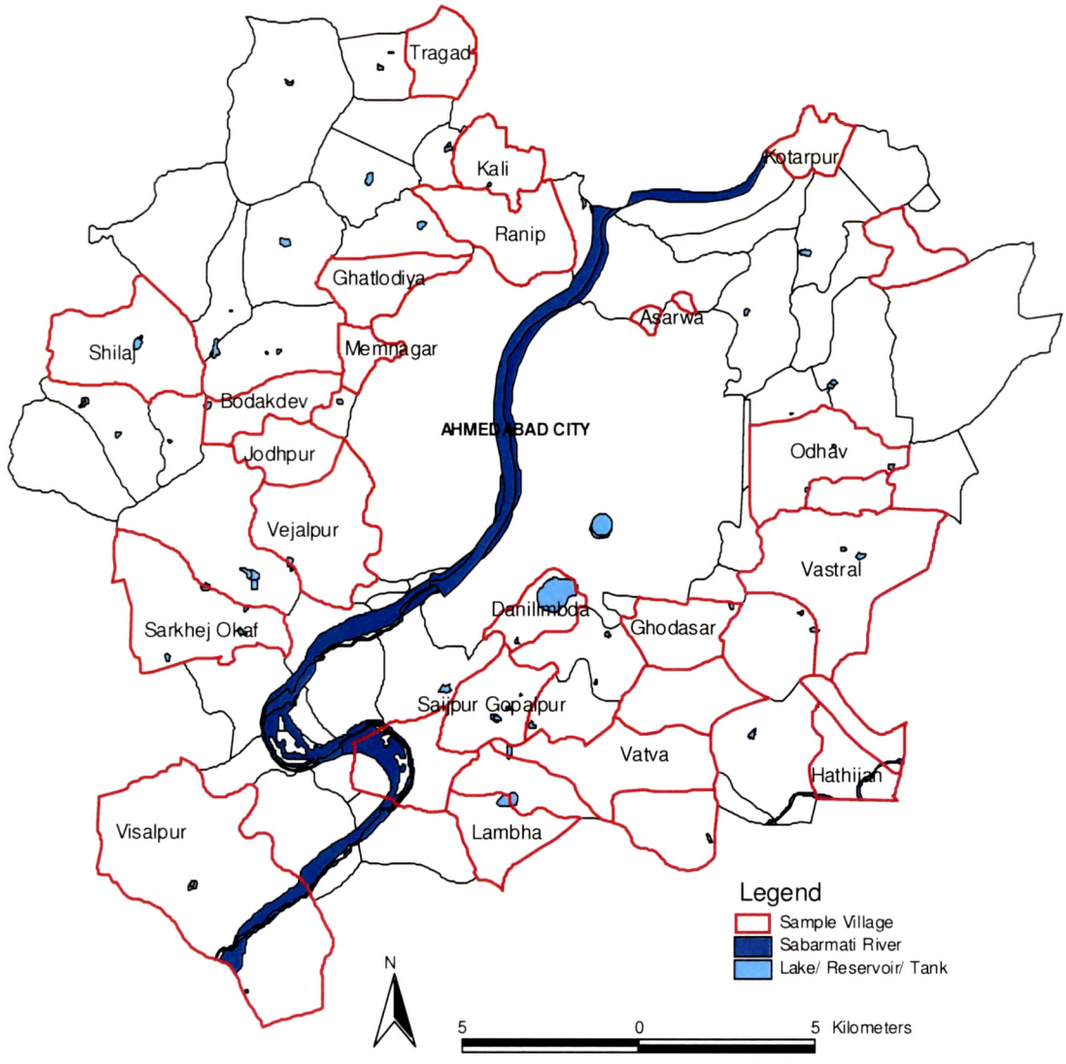

Plate 1.10 – Ahmedabad City Taluka Region: Drainage
Source: Prepared from Base Map, BISAG, Gandhinagar

The territory representing the total catchment areas of different rivers are identified and demarcated by dividing the region. These zones are further subdivided into smaller areas based on next order rivers and tributaries. These smaller areas are called watersheds. The watersheds are further sub divided into sub watersheds, mini watersheds and micro watershed. The region is defined under rivers flowing to Arabian Sea with one basin draining into Sabarmati and another draining into Gulf of Kutch. Further

classification of catchments, sub catchments and watersheds are systematically tabulated and presented in Plate 1.11.

Ahmedabad City Taluka Region: Classification of Watershed

Watershed Code	Catchments	Sub Catchments	Watershed
5F1A6	RB of Sabarmati and upper part beyond Hathmati	RB beyond Hathmati (Bhogra)	RB Sabarmati
5F2C5	LB of Sabarmati upto Hathmati	Vatrak and tributaries	Khari
5F2D1	LB of Sabarmati upto Hathmati	LB directly draining and Hathmati	LB direct Drainage
5H3A1	Rupen, Saraswati, Banas draining into Little Rann of Kutch	Southern part mostly Ephemeral drainage	Mostly Ephemeral

Source: Watershed Map; BISAG; Gandhinagar

1.5.1. RIVERS

Sabarmati rises at a place near in Weharia in Rajasthan. Thereafter touching the borders of Banaskantha, Sabarkantha and Mahesana districts it enters Gandhinagar district and flows through the study region. It flows through the Naroda, Hansol, Vadaj, Ahmedabad, Danilimbda, Shahwadi, Gyaspur and Piplaj villages. Then the rivers flows through Vanzar, Damod, Kasindra, Miroli, and Navapura villages. The river has a tendency of overflowing its banks frequently. In August 1973, the floods raged down the Sabarmati as it burst its banks. Overnight at least 2500 families of Ahmedabad city were rendered homeless.

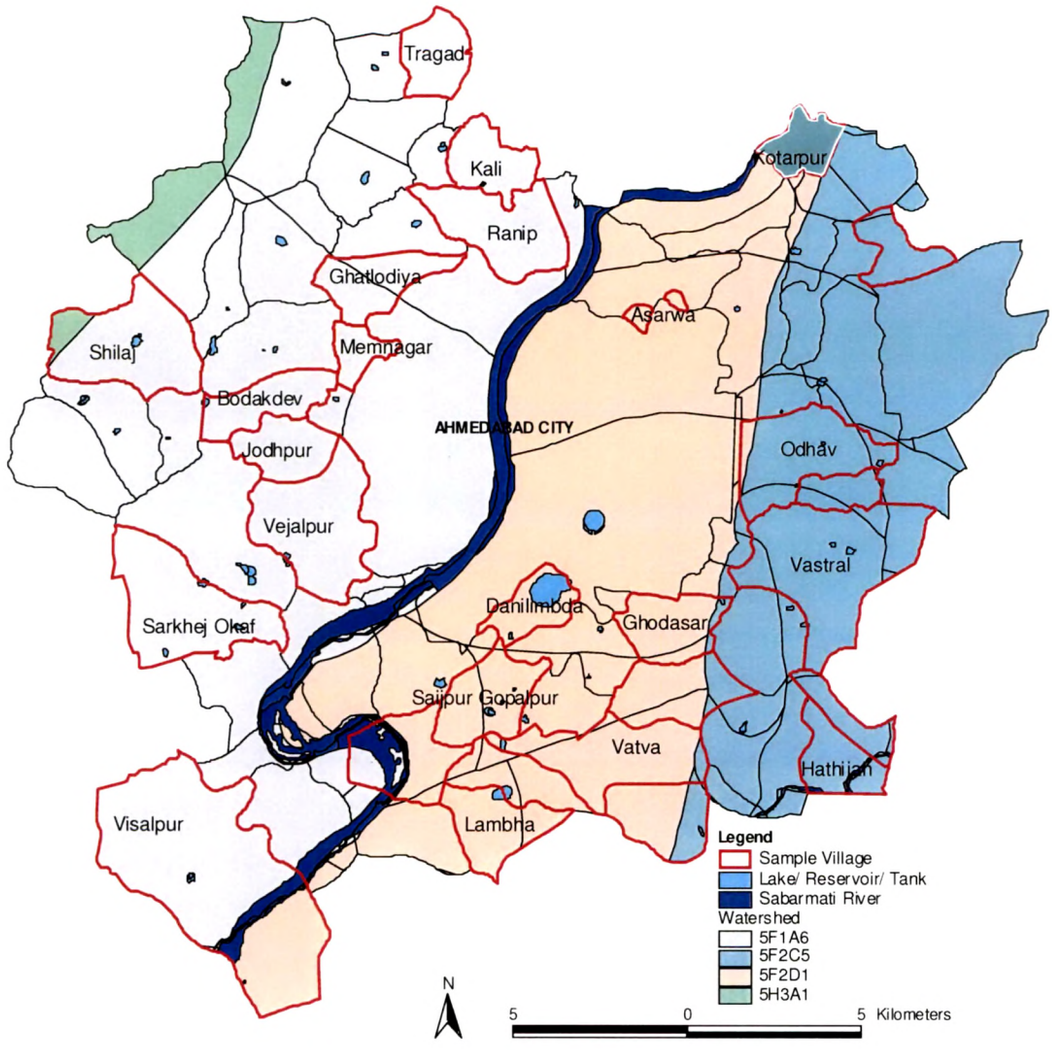

Plate 1.11 – Ahmedabad City Taluka Region: Watershed
Source: Prepared from Base Map, BISAG, Gandhinagar

1.5.2. LAKES

Chandola Lake: The Chandola lake about 3 km South of Ahmedabad near the Tomb of Shah Á lam has a circular shape. It covers an area of 181 hectares. The lake was in existence when Asha Bhil founded Ashapalli.

Kankaria Lake: The lake is at a distance of a 1.6 km from Raipur gate of Ahmedabad and is called Hoje-I-Kutub (Kutub's Pond). This reservoir is probably the largest of its kind and

covers 76 hectares. It is more than 1.6km round and is polygon of 34 sides, each side with 57.91m long. Sultan Kutub-ud-din completed it in 1451 AD. The lake has tires of cut stone steps with six sloping flanked by cupolas and an exquisitely covered water Sluice. From the 17th century the lake has been one of the centre of attractions of Ahmedabad. It has a beautiful garden in the middle called Nagina Wadi or Jewel Garden. Kankaria Lake is a popular picnic spot and the adjoining hill garden, which has a small aquarium, aviary, and a boat club, together makes it a pleasant place to visit.

1.6. CLIMATE

The climate of the region is tropical, semi arid to sub humid monsoonic type, characterized by three well-defined seasons viz. monsoon, winter and summer. Southwest monsoon starts normally from 3rd week of June to the end of September. The average rainfall is 764.8 mm with an average 33 rainy days. The intensity of rain remains high during the months of July and august. The climate of the region is generally hot except during monsoon and the short winters. The temperature varies from 46ºC to 10ºC. The humidity also remains high during rainy season and declines to low during summer. Southwest monsoon brings rains into the region and the proportion of humidity goes as high as 80.0 per cent, otherwise during the hottest summer days the relative humidity declines and reaches to 20.0 per cent. Major rainfall occurs in the months of July and September.

1.6.1. TEMPERATURE

Winter season starts from first week of November and remain up to last week of February. Thereafter the summer season starts from 1st March and remains upto 31st May. The mean temperature recording during winter and summer varies from 21.5º to 32.62ºC respectively.

Table 1.3 – Ahmedabad City Taluka region: Mean Maximum and Mean Minimum Temperature

Year	Maximum Temperature (in Centigrade)	Date	Minimum Temperature (in Centigrade)	Date
1966	44.9	May 5	7.8	December 31
1967	45.0	May 18	6.0	January 14
1968	43.8	May 29	4.4	December 27
1969	44.6	May 26	6.4	December 27
1970	47.5	May 11	7.6	February 1
1971	44.3	April 10	8.2	January 23
1972	46.1	May 16	6.1	February 13
1973	46.2	June 3	4.3	January 28
1974	43.8	May 10	5.3	February 8
1975	43.3	May 8	7.4	January 2
1976	43.3	May 13	9.4	January 7
1977	44.2	May 15	4.4	January 28
1978	42.4	May 6	6.8	January 22
1979	45.0	June 10	8.0	January 4
1980	44.8	May 4	7.6	February 6
1981	44.4	April 13	8.0	December 10
1982	41.4	May 25	6.2	January 24
1983	43.9	May 6	3.6	December 27
1984	44.5	May 19	3.5	February 21
1985	44.4	May 19	6.4	January 2
1986	45.4	May 18	4.4	December 15
1987	44.4	April 20	8.5	January 2
1988	45.7	May 11	10.3	January 25
1989	45.4	May 20	8.0	January 11 & 25
1990	44.3	May 11	4.0	December 31
1991	46.6	June 3	4.8	January 2
1992	44.4	Jun. 5 & 10	4.8	January 6
1993	44.4	June 8	6.9	February 20
1994	45.7	May 23	6.6	December 12
1995	45.4	May 31 & June 6	8.4	January 2
1996	44.4	May 9 & June 2 & 3	7.9	January 18
1997	44.0	May 19	7.3	January 21
1998	45.5	May 24	6.0	January 18
1999	43.8	May 2	6.2	January 7
2000	44.2	June 27	4.9	January 15
2001	44.5	May 7	6.6	February 15
2002	46.3	May 5	5.4	January 28
2003	44.2	May 11 & 18	7.4	December 27

Source: Meteorological Centre, Ahmedabad

Mean season wise variations in temperature recorded during the winter and summer ranges from 21.5ºC to 32.62ºC respectively

and the Mean Annual Temperature for the region remain 27.45ºC.

Wide variations in last 37 years has been tabulated in the table no.1.3 Mean Maximum Temperature with 47.5º was recorded on 11 May, 1970 followed by 46.6º, 46.3º and 46.1ºC in June 1991, May 2002 and May 1972 respectively. On the other hand mean lowest temperature was recorded as 3.5ºC on 21 Feb. 1984.

The table clearly depicts the variation of extremes being recorded in the temperature in about four decades. Similarly monthly variation in the temperature has been presented in the Table 1.4.

Table 1.4 – Ahmedabad City Taluka Region: Monthly Variations of Temperature

*** Temperature in Centigrade**

YEAR	2001		2002		2003	
Month	Max.	Min.	Max	Min.	Max	Min.
January	28.1	11.1	27.9	11.3	29.1	13.8
February	31.8	12.4	30.6	13.4	31.1	16.5
March	35.5	19.8	36.3	19.8	35.8	19.7
April	39.7	23.4	40.6	24.9	40.0	25.4
May	40.9	27.3	42.6	27.6	41.7	27.2
June	35.4	26.4	39.1	27.8	39.1	27.7
July	31.4	25.4	33.6	26.1	32.9	26.0
August	32.1	25.1	32.7	24.8	32.0	28.4
September	35.9	25.2	34.4	24.1	32.5	24.8
October	37.1	22.3	38.9	21.3	35.7	20.5
November	34.2	16.1	34.8	15.3	33.7	18.3
December	31.1	11.9	31.7	12.7	29.5	12.9

Source: Meteorological Centre, Ahmedabad

1.6.2. RAINFALL

The region under study receives most of its rainfall mainly from the southwest monsoon. 60.0 per cent of the annual rainfall occurs during the months of July and August. The long terms normal annual rainfall for the region is 72.8 mm. The rainfall data along with the number of rainy days for last 35 years (1961-

2003) is presented in Table 1.5. The average annual rainfall for the period has been 732mm. Similarly monthly variation in rainfall is presented in Table 1.6.

Table 1.5 – Ahmedabad City Taluka Region: Rhythm of Rainfall

Year	Number of Rainy days	Rainfall in Millimetres
1961	48	831.3
1962	31	765.3
1963	39	1005.3
1964	37	698.0
1965	26	457.1
1966	29	609.1
1967	41	986.3
1968	17	392.2
1969	30	473.1
1970	47	1191.5
1971	34	544.7
1972	25	301.6
1973	47	1070.9
1974	15	411.9
1975	37	1238.0
1976	56	1275.4
1977	71	1264.2
1978	43	805.4
1979	47	541.0
1980	55	733.4
1981	71	955.7
1982	49	890.4
1983	75	1085.7
1984	40	762.8
1985	37	768.5
1986	31	449.8
1987	23	253.0
1988	45	739.1
1989	30	722.7
1990	44	1041.6
1991	21	541.1
1992	34	575.2
1993	20	683.5
1994	54	1325.5
1995	36	380.0
1996	38	787.8
1997	39	1293.5
1998	41	988.8
1999	22	597.0
2000	17	727.9
2001	35	680.9
2002	20	397.8
2003	32	893.2

Source: Meteorological Centre, Ahmedabad

Table 1.6 - Ahmedabad City Taluka Region: Month wise Rainfall

Year / Month	2001		2002		2003	
	Number of Rainy days	Rainfall (mm)	Number of Rainy days	Rainfall (mm)	Number of Rainy days	Rainfall (mm)
January	-	-	-	-	-	-
February	-	-	-	-	2	11.4
March	-	-	-	-	-	-
April	2	10.3	-	-	-	-
May	2	40.4	-	-	-	-
June	7	214.7	6	147.6	3	48.6
July	14	231.7	5	63.9	15	318.1
August	10	183.0	6	114.6	9	493.1
September	-	-	3	71.2	3	22.0
October	-	-	-	-	-	-
November	-	-	-	-	-	-
December	-	-	-	0.5	-	-
Total	**35**	**680.9**	**20**	**397.8**	**32**	**893.2**

Note: Number of Rainy days shows Number of days with rainfall of 002.5 millimeters or more
Source: Meteorological Centre, Ahmedabad

1.6.3. HUMIDITY

With the impact of Southwest Monsoon during the Rainy season Relative humidity in the region crosses the range with 60.0 per cent and more. While in the remaining part of the year the air remains comparatively dry. Summer season is known as the driest period in the year while on the other hand with the onset of monsoon relative humidity in the afternoon at times reaches to 25.0 per cent. With the monsoon rains usually the relative humidity reaches to more than 80 per cent.

1.6.4. WINDS

Winds are generally light with some strengthening force during the summer as well as southwest monsoon season. During the southwest monsoon season winds generally blow south-westerly to westerly. Towards the end of the southwest monsoon season north westerlies also begin to blow. In the next four months the winds blow mostly between northwest to east.

While in February and March winds blow from northwest and northeast in morning and between southwest and northwest in the afternoons. In rest of the summer season winds blow from southwest and northwest.

The wind velocity for most of the part of the year normally remains 16 km per hour. However, occasionally wind does rise upto a maximum of 54 km per hour. There are occasional cyclonic winds and the wind velocity at the time of cyclones become very high as was recorded in 1959 wherein wind velocity was 90 km per hour.

1.7. NATURAL VEGETATION

The region under study falls in the Plains of North Gujarat-Arid Lands of Bio-Geographic Zone. The existing ecosystem of the region belongs to the dominance of Agriculture land, Wasteland, Wetlands (Ponds and Lakes), dry rivers, ravine forest and rocky hills. There are hardly any wood or forest patches within the territory of the region. The present forest wealth is restricted to roadside plantation and the plantation along the canal banks. Most of the forests are of inferior dry scrub and are not very productive. The plains are mostly devoid of forest cover. The isolated scrub includes Ziziphus, Pithecelobium, Acacia, Parkinsonia and other Xerophytic plants. About 25 most common trees and 20 varieties of grasses are found the region in a scattered form in the region.

1.7.1. WETLANDS

Wetlands constitute the vital links with the hydrological cycle. They provide a multitude of services like purification and regulation of flows, fisheries, habitat provision to plants; animals and microorganisms; providing opportunities for recreation and tourism sports; and so on and so forth (Silvus, 2000).Their intrinsic hydrological functions act as buffer against the extremes of droughts and flooding. In monsoon wetlands absorb and restore water and therefore, reduces the risk of flooding. (Singh, H.S, 2001) Some of the lakes like Chandola and Goblej near Ahmedabad have been supporting the high water flow diversity in the past.

1.8. IRRIGATION

The region is well known for the uneven distribution of rainfall. That is why to ensure the agricultural production, the need to develop irrigational facilities became of prime importance. The underground water is being extensively used as the main source of irrigation through out the region.

In the region dug wells, tube well and canals are intensively used to irrigate the agricultural fields with 44.74, 42.21 and 13.05 per cent of the total irrigated area respectively.

In general, the command areas represent the areas with intensive agricultural activities and over the period of time efforts are being made to prevent the conversion of agricultural land. The central part of the study

region is irrigated by the command area of the Fatehwadi scheme. The study region is also served by the Vasna Barrage.

1.9. NATURAL DISASTER PRONE AREAS

The region falls under the Seismic Zone III and is considered as moderately prone to earthquakes as has been classified by GSDMA, Gandhinagar. While adjoining areas along the Sabarmati river are frequently prone to floods.

1.10. RELIGIOUS, HISTORICAL & CULTURAL PLACES

The region is also famous for sacred places of various religions. The city has a number of temples sacred to Vaishnavas Shaivities, Jains, the Jewish Synagogue, Parsi Fire Temple, Christian Churches, the Prathna Samaj, Hatheesing Jain temples constructed in 1848 etc. The celebrated Bethaks of Mahaprabhuji Vallabhacharya are found at Asarva and Naroda in the city. The Vaishnav temple of Shri Natwarlalji is the oldest in the region. Other Vaishna temples are Shri Krishna temple in Raipur, Ranchhodraiji temple in Saranpur and Shri Jagannathji temple near Jamalpur Gate, which are equally famous. The Swaminarayan temples in the Ahmedabad city and the Gurukul established recently are sacred to the followers of the Swaminarayan Sect.

The Harijan Ashram at Ahmedabad founded by Mahatma Gandhi on the banks of the river Sabarmati is one of the many attractions for tourists. The historic Dandi March, which he undertook on 12th March, 1930 has brought Ahmedabad on the forefront in the freedom movement. The Shaking Minarets are the architectural wonders, and are not found

elsewhere. The Jumma Masjid of Ahmedabad is one of the biggest in India. The Sidi Saiyad's Mosque is also famous for its carved stone panel. The Roza at Sarkhej, near Ahmedabad city , is the oldest and the largest of its type in Gujarat. The Dada Hari's Vav, is considered as one of the most magnificent and oldest existing step-wells in Gujarat. Along with these architectural monuments of the past, region is also known for Municipal Museum -Sanskar Kendra building and others built by La Corbusier, the famous Italian architect, the Drive-in Theatre and the revolving restaurant has been added recently. The Ahmedabad City Taluka region presents a pleasant blending of the old and new monuments.

1.11. GROWTH OF AHMEDABAD CITY

1.11.1. INDUSTRIAL GROWTH

The city of Ahmedabad was known as **Manchester of India** in the past, due to the predominance of cotton textile industries, Historically, an important trading town, it was transformed into one of the major industrial centers of the region as well as of the country due to the entrepreneurial abilities of its elite residents. The multiplier effect of this textile industry has been evident in the rapid growth of commercial sector, chemical and dyes industries and light engineering industries - as dependent on this core sector. The first textile mill established in 1857 became a landmark in the growth of Ahmedabad. This became the turning point in the city's economic history, which was further facilitated by the Railways in 1864. The growth of textile industries reached its peak in the 1940s attracting considerable migration. In the

post independence period, the city witnessed not only diversification of its industrial base but also significant progress in other spheres of lives especially the establishment of professional and technical institution of various types.

1.11.2. URBAN GROWTH

The city spread towards the northeast and southeast of the walled city after the spill over benefits from the textile industry were felt in a larger way. The industrial and residential growth however was confined to the eastern part of the river till the construction of the Ellis Bridge across the river in the late 19th century was completed. The construction of six more bridges with a regular interval namely the Gandhi Bridge, the Sardar Bridge (1940), the Nehru Bridge (1959), the Subhash Bridge (1973), the Indira Bridge (1982) and the Shastri Bridge (1990) further accelerated the expansion and development of the city area in to the western side of the river. These bridges are now positively helping to overcome the problem of traffic congestion.

Table 1.7 - Chronological Growth of Ahmedabad City Taluka

Years	Date	Area	
		Added km^2	Total km^2
1956	09.11.1955	1.05	53.51
1958	13.08.1958	21.08	74.59
1959	30.05.1959	5.12	79.71
1959	12.08.1959	6.01	85.72
1960	10.03.1960	1.89	87.61
1960	04.04.1960	5.4	93.01
1975	17.03.1975	5.2	98.21
1986	05.02.1986	92.63	190.84
2006	14.02.2006	41.00	231.84
2006	20.07.2006	216.32*	448.16

* Added 10 nagarpalikas and 30 gram panchayats.
Source: Ahmedabad Municipal Corporation

Residential, commercial and industrial activities have gradually developed in western, central and eastern Ahmedabad and in

parts of the walled city, respectively. Vatva, Naroda, Odhav, Rakhial and Asarwa areas have also developed on the eastern part as industrial area. While on the western part, Navrangpura, Ellisbridge, Naranpura, Memnagar, Paldi, Madalpur, Ambavadi, Vastrapur, Ghatlodia, Thaltej, Bodakdev and Vejalpur areas have developed as residential areas. However the commercial activity remained concentrated within the wall city area although there has been a gradual shift towards Ashram Road, Shri Arvind Marg (C.G. Road) and Sarkhej-Gandhinagar Highway. Gauging these changes territorial limits of Municipal Corporation of Ahmedabad have changed many times in last 50 years from 1956 to 2006.

The last change was made in 2006 and the city has been extended on all sides incorporating the out growth areas and gram panchayats into the municipal limits as shown in the Table 1.7. To meet the growing demand and to coordinate the developmental activities Ahmedabad Urban Development Authority (AUDA) as an administrate unit was constituted on 1st February 1978 by the state government under the provision of the Gujarat Town Planning and Urban Development Act, 1976. The state government has declared an area measuring 1294.65 sq. km under for AUDA including the area of Ahmedabad Municipal Corporation. This was not a simple change of administrative territory but to a great extent it also became the main reason in transforming the rural environment of the Ahmedabad City Taluka region under study. In last two

decades, city has extended well beyond the AMC limits especially towards the Western and Eastern areas. In the Western side development of AUDA area is along the Sarkhej-Gandhinagar Highway, particularly in Vejalpur, Jodhpur, Vastrapur, Bodakdev, Thaltej, Memnagar, Ghatlodiya and Ranip revenue villages.

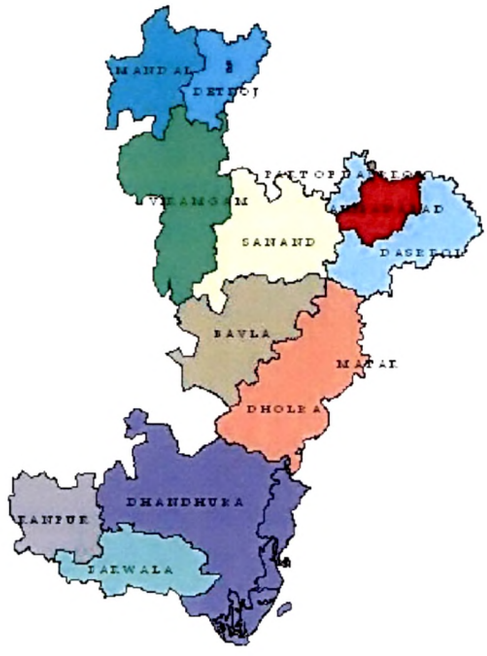

Plate 1.12 – Location of Ahmedabad City Taluka and Study Region
Source: BISAG, Gandhinagar

1.11.3. TRANSPORT LINKAGES

The study region is well connected with other parts of the state as well as the country and enjoys a intra and inter regional connectivity through dependable, fast and safe Road, Rail and Air transport network (Plate 1.13).

1.11.3.1. AIR

Ahmedabad has a domestic as well as an international airport. There are various domestic

airlines connecting Ahmedabad with Mumbai, Delhi, Chennai, Kolkata, Bangalore and other important cities as well as international flights to various overseas destinations.

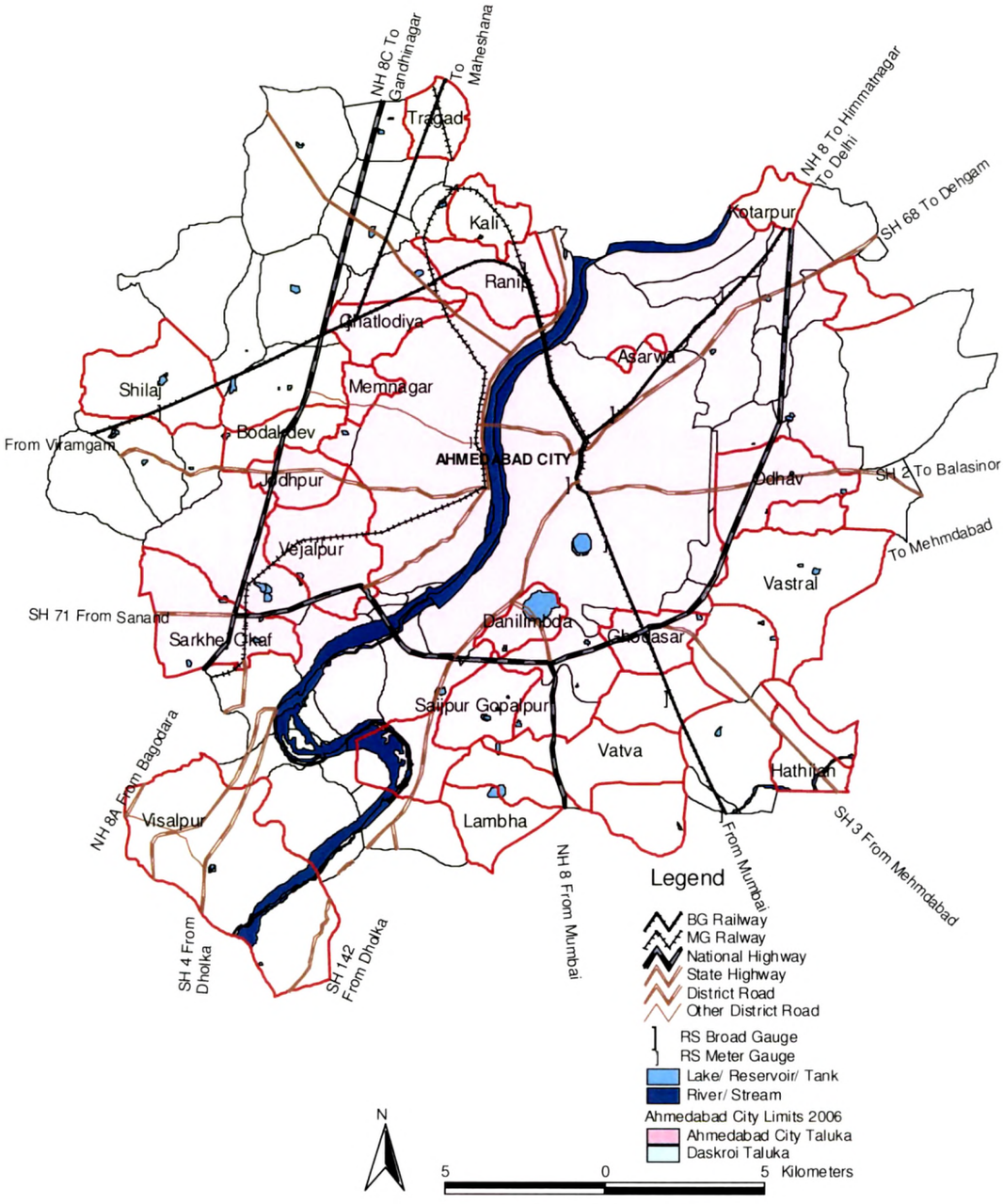

Plate 1.13 – Ahmedabad City Taluka Region: Transport Linkages
Source: Prepared from Base Map, BISAG, Gandhinagar

1.11.3.2. RAIL

Ahmedabad is linked with developed rail network with Delhi, Mumbai, Jaipur, Udaipur, Kolkata, Chennai, other major cities and towns of the state as well as of the country and several other important tourist centres. The Ahmedabad city at present has emerged as an important railway junction of Western Railway with a wider connectivity due to –

- The Mumbai – Viramgam Broad gauge
- The Ahmedabad – Khedbrahma meter gauge
- The Ahmedabad – Bhavnagar broad gauge sections of the Western Railway
- Ahmedabad – Udaipur broad gauge

Besides the broad and meter gauge railway stations (Table 1.8) of the Ahmedabad city, five other stations viz. Maninagar, Vatva, Asarwa, Gandhigram and Sabarmati are catering the movement of the men and materials in the region.

Table 1.8 - Ahmedabad City Taluka Region: Gauge-wise Rail Linkages

Taluka	Broad Gauge		Meter Gauge	
	Length in km	Station	Length in km	Station
Ahmedabad City	14	Maninagar Ahmedabad Sabarmati Chandlodiya	35	Asarwa Saijpur Sardarnagar Naroda Sabarmati Gandhigram Vastrapur Sarkhej
Daskroi	38	Ambli Road Gourdhuma Vatva Garetpur Barejadi Kodiyar	23	Medhra Kali road Chandkheda Kodiyar

Source: District Statistical Outline of Ahmedabad District 2005-2006

1.11.3.3. ROAD

National Highway No. 8 traverses through the study region. The National Highway No.8 connects Ahmedabad with New Delhi through Udaipur in the north and Mumbai in the south via Valsad. The NH-8 branches out as NH-8A, NH-8B and NH-8C linking Porbandar, Bhachau and Rajkot etc. There is a wide network of State Road Transport bus stops and railway stations across the region ensuring direct accessibility. Thus all villages are connected by road facilities. State Road Transport buses and private luxury coaches ply to various cities of Gujarat, Maharashtra, Madhya Pradesh, Delhi and Rajasthan positively ensures the movement of people.

The region also has a wide network of Post Offices, Post & Telegraph Offices and Telegram. Telephone-Post offices are also situated in the study region. Moreover, numbers of PCO booths are operating

through out the study region. This is how most of villages of the study region are connected by transport, telecommunication and postal facilities. The expansion of mobile phone network in and around the study region has revolutionised the communication in the region in last 10 years.