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URBAN SHAPE OF AHMEDABAD CITY TRIGGERED BY INDUSTRIAL ACTIVITY, CASE STUDY OF INDUSTRIAL ESTATES OF GIDC

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ABSTRACT: Industrial activity of industrial estates generates occupation of land on its surrounding area. The areas become more and more developed by residential and commercial uses. Development of the city for its increased population encouraged changes of agriculture area located in between central city and the three industrial estates. Since industrial activities of industrial estates become urban generators to change the use of land, from agriculture to developed land, hence it also affected to the physical morphology of the urban areas. The paper tries to analyze the growth of the city affected by the three urban generators located in eastern part of the city that are the industrial estates under GIDC management.

KEYWORDS: urbanization, rapid growth, regional planning

1 INTRODUCTION

Ahmedabad is the largest city in Gujarat state and seventh largest city in India (Fig 1). It is a growing fast city since its inception in 1411. In the year of 1960's, there were industrial estates developed on the eastern outskirts of the city: Vatva, Odhav and Naroda; that located outside the municipal authority. The three industrial estates are under management of GIDC (Gujarat Industrial Development Corporation) on Gujarat state level. Industrialization in Ahmedabad was highly generated by the cotton mills industry in the year of 1950s. Since then, the city becomes larger and larger in terms of population and also size.

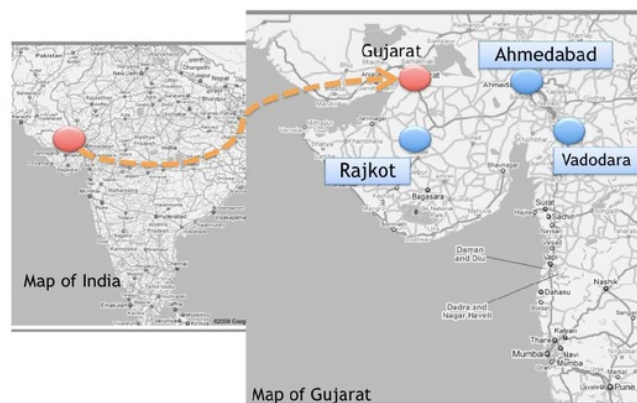


Figure 1 Location of Ahmedabad city and industrial cluster of Gujarat

The early industrialization of the state in 1960s, industrial activity was clustered on the major cities like Ahmedabad, Vadodara, and Rajkot (Fig 1). In the recent times, Industries and Mines Department of Government of Gujarat has encouraged to facilitate fast establishment of Special Economic Zones and

is around 4.5 million: 4,518,240^{viii}. There are 886 female to every 1000 males. Literacy rate in Ahmedabad is 79.89% which is highest in Gujarat. There are more than 30000 rural families lives in Ahmedabad , 5,41% of those are below poverty line.

Driven by the growth of textile industry reached its peak in the 1940s, the city attracted migration from around Gujarat and India. In the post-Independence period, the city witnessed not only diversification of its industrial base but also significant development of professional and technical institutions, such as the Physical Research Laboratory, the Indian Institute of Management, and the Centre for Environmental Planning and Technology³. In the late 1970s and 1980s, the textile industry has declined, resulting in the closure of more than half units and laying off about 60,000 workers. After 1990-1991, local economy has shown a revival. This is indicated by reduction number of lowest income group and also an increase in regular workers.

Many factories were built on large estates in or around the centre city before 1980s, and become centre of noise and pollution of its less infrastructure. The city suffered from traffic congestion and large number of slums. The old textile industries were no longer competitive, and new industries were located outside the centre city. In the year 1980s, the government did not allow polluting industries to locate in a radius of 20 kms around the city center⁴. The idea was not covered by any regulation, but only policy at state level^{ix}.

The city's population has increased in a major way following economic expansion and modernization. Ahmedabad being a centre of commerce and also government institutions and military base. The density population at 258 per one sqkms area calculated on the basis of the estimated population of the earthquake affected areas.

3 CASE STUDIES

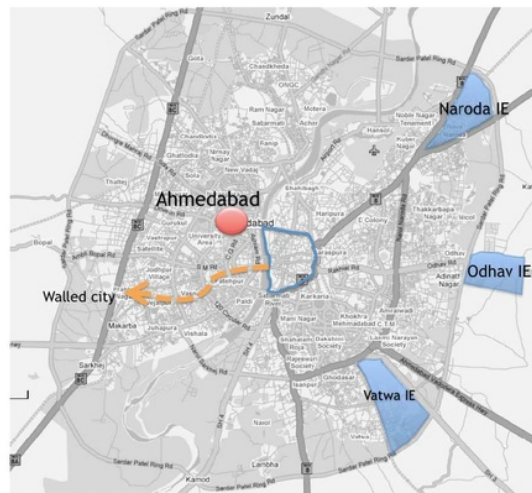


Figure 3 Location of industrial estate in Ahmedabad under GIDC management

In order to accelerate the pace of industrialization in Gujarat, under the Gujarat Industrial Development Act of 1962, GIDC came into existence in 1962. GIDC operates all over the state of Gujarat. It operates and maintains industrial estates in various districts of Gujarat State. These estates are self-contained sanctuaries capable of sustaining a large number of industries within themselves. GIDC provides ready to occupy sheds for immediately starting an industry and also provides godown for storage of its material. All across the state, GIDC has planned for 252 Industrial Estates of which 171 are developed and functional.

In Ahmedabad, GIDC operates three estates: Naroda, Odhav and Vatva (Fig 3). The three estates have been developed around year of 1968. The estates occupy areas of 120-500 hectares of land on eastern part of Ahmedabad city. Currently, the estates connected each other by Narol Naroda Road and Sardar Patel Ring Road and also connected to other cities in Gujarat. The three estates also connected with Kharikat Canal that lay from north to south.

Table 1 Characteristics of GIDC case studies

		NARODA GIDC	ODHAV GIDC	VATVA GIDC
1	Year of establishment	1968	1968	1968
2	Total area	357 ha	127 ha	512 ha
3	Number of plots	689	491	
4	Numbers of sheds	416	525	
5	Distance from central city (approximately)	8 km	4,5 km	4,5 km
6	Number of company/ factory	660	1502	1187

4 URBAN GROWTH OF AHMEDABAD CITY

Many factories in the early of industrialization have been developed inside the city and around the old city. The early industrialization of the Gujarat state in 1960s, industrial activity was clustered on the major cities such Ahmedabad. The city became overcrowding, increasingly higher land prices, and lack of effluent disposal sights. These industries and mostly the new industries began looking for location sites outside the city limits, into the industrial estates which being established by the state in the rural parts of Gujarat.

The state government under GIDC management developed some industrial estate on the outskirts city, they are located at maximum of 10 kms outside the city. The state government also gave incentives to industries to pursue land on those areas. In 1968, government under GIDC management appointed packed areas of land on the eastern outskirt of the city. The industrial estate are: Naroda, Odhav and Vatva (Fig 3).

After more than 40 years of development, the three industrial estates generated the growth of its surrounding areas. Agriculture land has been changed into developed land, and use of land had also been changed, such from agriculture to housing, housing to commercial, and public land for private or commercial use. The industrialization process in those particular areas has triggered these changes. According to Balchin, Isaac and Chen (2000)¹, industrialization always affected to people and urban shape. Population of that city became increased since the city offer many job related to industries.

According to GIDC advisor⁹, in the 1980s, there are existed law that appointed land 20 kms outside the city could not be used for industries in order to protect agricultural land. Consequently, new laws restructuring the process of acquiring land making it easier to purchase land in what the government deemed outskirts, areas of low economic production and value. Incentives by the government were established to encourage industries to move away from central city, predominantly agricultural areas. As domino effects, land that left and not purchased by the state was slowly being polluted by the industries, the land became increasingly infertile and was slowly sold to the larger industrial estates.

Referred to historical data and process of urbanization driven by industrialization, which is explained on previous section, process of industrialization in Ahmedabad could be summarized as follow:

- 1861: first cotton mill were developed on the western side of the city
- 1940: since the city became famous as Manchester of East, it has attracted migration from outside Gujarat, hence the western side grew rapidly. Outside the walled city on eastern part,
- 1947: (post independence) eastern side of the city grew rapidly due to the development of some institutions and housing areas for middle income people
- 1968: development of three GIDC industrial estates (Naroda, Odhav, Vatva) on the eastern outskirt of the city (maximum of 8 km only)
- 1970-1980: textile industry has declined, many workers became unemployed
- 1980s: industrial activity developed on the outskirt of the city in radius of 20 km (government policy)
- 1986: the boundary of AMC expanded to the three industrial estates

¹ The boundary of Ahmedabad city has been expanded due to its increased population and services. The development of the industrial estates (Naroda, Odhav, Vatva) on eastern side significantly gave impact to the Ahmedabad Municipal Corporation (AMC) area. The growth of Ahmedabad city in this case is AMC area, could be seen in three different stages of growth. The growth could be defined in three stages of urban shape of Ahmedabad city driven by industrialization. AMC has changed its boundary three times since the city' development due to respond the growth of the serviced city. The three stages are (Fig 4):

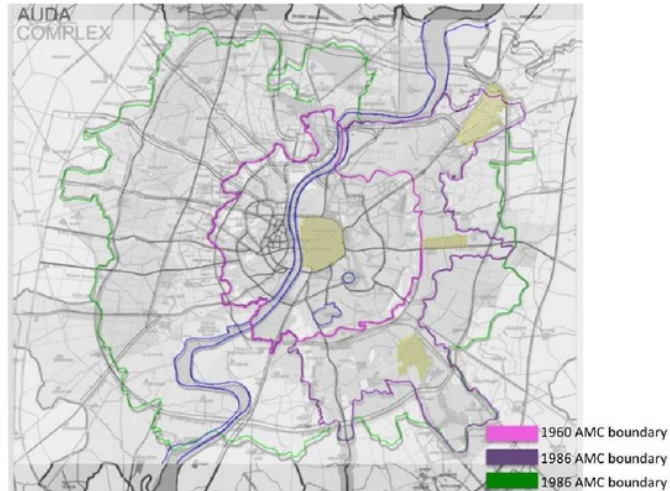


Figure 4 Stages of Ahmedabad urban growth driven by industrialization

1. In the year of 1960s, when economic of the city became stronger and cotton manufacturing activity became more and more developed around the walled city, and also western side of the river developed due to service development, city boundary was expanded to western side and outside walled city in the eastern part. This shape could be define as first changing of city' boundary generated by industrialization. Physical development of eastern and western side of the city were relatively balance in shape, it also driven by the development of bridges which connecting both sides. Odhav, Naroda, and Vatva industrial estate located outside the AMC boundary, since it connected to dirty activity and inappropriate land use inside the city.
2. In 1986, the boundary of AMC was expanded only to the eastern side. The urban shape has protruding figurine of the three GIDC industrial estates, Naroda, Odhav, and Vatva, which are located on the eastern part of the city. The western boundary still remained same as previous. Naroda, Odhav and Vatva became part of AMC area due to the development of area in between the city and the industrial estates. The new urban shape at that time could be understood as a result of the change of land occupation development in between city centre and the industrial estates, from agriculture to developed land. It also triggered by the development of ring roads and state/ national highway around the city. Surrounding areas of the three estates became developed (radius of 1-2 kms from the estate) change also from agriculture into developed land, housing land occupation into commercial occupation. Some *talukas* (villages) that located around the estates merged with the estate as one big area. Since 1968 to 1986, the three estates mostly generated the growth of the surrounding areas, the three became urban generator of Ahmedabad city growth particularly on eastern part. After 1986, not only the industrial activity generated the areas, but also other service development, such as school, market, and some institutions. These activity as sub-sub urban generator which firstly driven by main generator; the industrial estates.
3. In 2002, AMC expanded its area, both to eastern and western side of the city. There is no more protruding figurine of the three industrial estate. The three protruding shape has merged each other, hence become one solid shape with western boundary. The only boundary that remain same is on the northern side, since it is connected to boundary of capital city; Gandhinagar. Issue of urban agglomeration became major concern of AMC to expand its area. It mostly driven by the development of many ring roads and state/ national highway. Surrounding area of the estates has been appointed as commercial areas and light industrial areas.

Above analysis has been considered based on research of AMC map and some interviews. Studying to the current development areas of Ahmedabad city based on satellite photo (Google Earth™) it can be seen that the developed areas on eastern side mostly generated by the three estates. Study on its land coverage, nearer to the estates, more dense the area develop; and vise versa. The shape of its urban areas on eastern side actually has three protruding shape, which each shape is the location of Naroda, Odhav and Vatva industrial estates. Areas in between these protruding shape, currently is as vacant land and agricultural land. In the future, as AMC prediction, these areas will be developed and grown due to respond of urban generator of the industrial estates, as long as the industrial activity operates.

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