



STUDY OF URBAN GROWTH AND LANDUSE CHANGE OF DHULE, MAHARASHTRA (INDIA)

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ABSTRACT

Landuse is the expression of human activities. It is dynamic in nature, altering over space through time. Landuse analysis of any city reflects the characteristics of the city including physical, economic and social aspects. There is close relationship between urban growth and changes in landuse pattern. Therefore, in the present paper attempt has been made to study the urban growth and landuse changes in Dhule city.

The city is situated on the bank of River Panzara at an elevation of 241 meters above the mean sea level. It is the district headquarters of Dhule district and well-known centre of the Khandesh region of Maharashtra State. Total area occupied by municipal corporation limits of Dhule city is about 46.46 sq km, which lies between 20° 52' 15" N to 20° 56' 33" N latitudes and 74°44'45"E to 74°48'44"E longitudes. According to 2011 census, the population of city is about 3,76,093.

For the analysis of urban landuse, the period from 1981 to 2011 has been taken into consideration. The data are collected mainly from secondary sources. For the data analysis, simple statistical methods and cartographic techniques have been used. Study reveals that the city is growing almost in all directions. Population of the city is continuously increasing, however with variation in growth rate. In 1981, total built-up area of the city was 36.49% including 18.75% under residential area. Remaining 63.51% area was undeveloped. By the year 2011, total built-up area increased up to 49.25%. The percentage of residential area to total city area increased from 18.75% in 1981 to 27.65% in 2011. In 30 years period significant changes occurred also in area under commercial, industrial, public and semi-public sectors.

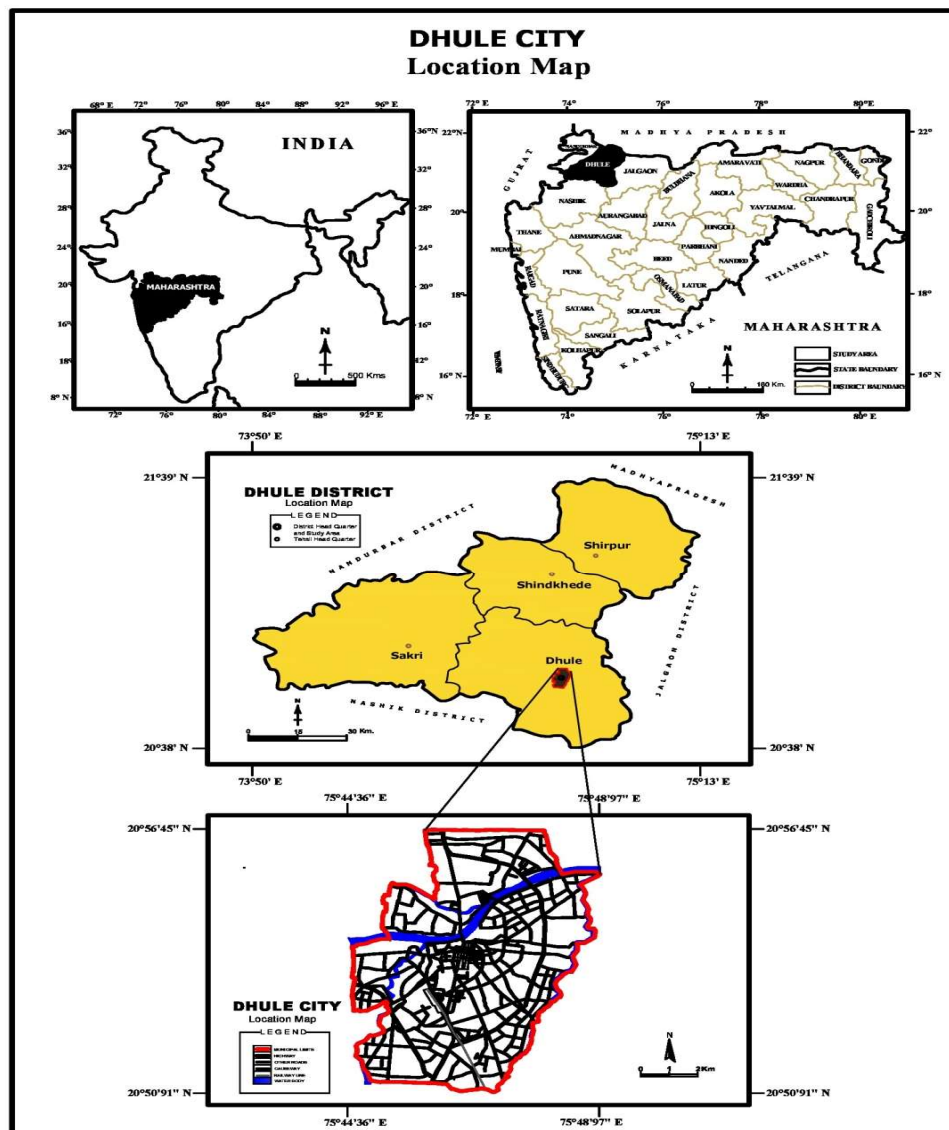
Keywords: Urban Growth, Landuse, , Built-up area , Undeveloped area.

INTRODUCTION

The bases for urbanization vary from time to time. In recent times, industrialization and economic development are found predominantly responsible for urbanization. But, the historical review of the problem reveals that social, cultural and political forces too have their profound impact in the process of urban growth. After industrial revolution urbanization has become an important trend all over the world. It is responsible for extraordinary growth of cities and towns, particularly in the economically developed and developing areas. India has also shown a considerable level of urbanization mainly after independence. With the urban growth the landuse pattern in the vicinity of towns or cities also changes rapidly. It is important to study relationship between urban growth and changes in landuse pattern. Therefore, in the present paper attempt has been made to study the urban growth and changing landuse scenario of Dhule city.

STUDY AREA

Dhule is a head quarter of district and Khandesh Region of Maharashtra state. It is situated at the bank of the river Panzara, a tributary of Tapi. The city is located at the latitude of $20^{\circ} 52'15''$ North to $20^{\circ} 56'33''$ North and a longitude of $74^{\circ} 44' 45''$ East to $74^{\circ} 48'44''$ East. It sits in a strategic position on the Deccan Plateau. The Municipal Council was formed in 1860 when the geographical area of the town was 3.11 sq.km. By the year 1976 the area of city increased up to 46.46 sq. km. On 30 January 2003 the Municipal Council was converted in to a Municipal Corporation.



OBJECTIVES

The main aim of the present study is to assess the Urban Growth and Land use. To achieve this aim of the study the specific objectives may be outlined as follows:

- To know the physical, cultural and economic set up of the city.
- To study the population growth of the city.
- To study the different trends observed in urban land uses.
- To analyze the changing land use pattern of the study region.



DATABASE AND RESEARCH METHODOLOGY

For the present study, the data have been obtained from both, the primary and secondary sources. Base map of the city and other primary maps showing wards, land use, etc. are obtained from the municipal corporation office and town planning office. Geographical and socio-economic information about the city have been collected from published literature. Secondary data regarding population have been collected from the census handbook and CD-ROM and also from municipal corporation office. Data regarding industries are obtained from the office of the Executive Engineer. The detailed study of land use in Dhule city has been carried out for the period extending from 1981 to 2011. The data thus, collected through primary and secondary sources, are processed by adopting appropriate methods and techniques to investigate various aspects of landuse. For the analysis simple statistical methods and cartographic techniques have been used.

AREAL GROWTH OF DHULE CITY

In the beginning of the 19th century, Dhule was an insignificant village, subordinate to Laling, the capital of the Laling or Fatehbad Subdivision. Dhule continued to exercise authority till the occupancy of the country by the British in 1818. Dhule was immediately chosen as the headquarters of the newly formed district of Khandesh by Captain John Briggs. In January 1819, he obtained sanction for building public offices for the transaction of revenue and judicial business. Captain John Briggs described Dhule as a small town, surrounded by garden cultivation, and shut in between an irrigation channel and the river. The town was located on the southern bank of the Panzara River with an area of about 1.5 sq. km. In 1819, the population numbered only 2,509 persons, living in 401 houses. In 1863, there were 10,000 inhabitants while by 1872 the number had further increased to 12,489, with 2,620 houses. From the date of its occupancy by the British, the progress of Dhule had been steady. Towards the end of 19th century the town had already become significant trading centre due to the trade in cotton and linseed. Coarse cotton, woolen cloths and turbans were manufactured for local use around this time. In 1872, Dhule was visited by a sever flood, which did much damage to houses and property. The Dhule council was formed in 1860, when only two wards were there. In 1863 population of Dhule city was 11,765. Dhule-Chalisgaon railway run from 1901, after that population of Dhule city was increasing. In 1951-52 the geographical area of Dhule city was 1683.49 hectares. In 1961-62 twelve wards created of Dhule city, when the geographical area of the town was 26.75 sq. km. The M.I.D.C. has developed in 1000 acres of land from Awadhan and Laling village (Outside Municipal limits). This factor would help the city grow in the direction of industrial development in near future. During last forty years the development of city has been taking place almost on all sides. After inclusion of the additional areas within municipal limits, the development is also fastly taking place in the areas of Deopur, Walwadi, Wadel road, Nagaon Bari, Vadjai road, Bypass highway, and Mahindale. The development on eastern and southern sides of the city is, however restricted up to the diversion of Bombay-Agra national highway and no development is seen beyond that, excepting the hamlet of Mohadi, which is also experiencing fast trend of development after its inclusion within municipal limits. On 30 June 2003 the council was converted into a Municipal Corporation. The area of the Municipal Corporation at present is 46.46 sq. km.

POPULATION GROWTH OF DHULE CITY

Urban growth and Landuse changing pattern is based on Population growth of city. The population growth refers to the growth of human population in a particular area

during a specific period of time. The growth may be positive or negative. It can be measured either in terms of percentage or in absolute numbers. The population growth of Dhule city since 1901 is given in the form of absolute numbers and also in terms of percent (table-1).

Table No.1: Population Growth of Dhule city

| Census Year | Population | Absolute Change | Growth Rate |
|-------------|------------|-----------------|-------------|
| 1901 | 24726 | | -- |
| 1911 | 30341 | 5615 | +22.71 |
| 1921 | 29497 | -844 | -2.78 |
| 1931 | 39656 | 10159 | +34.44 |
| 1941 | 53308 | 13652 | +34.43 |
| 1951 | 76880 | 23572 | +44.22 |
| 1961 | 98893 | 22013 | +28.63 |
| 1971 | 137129 | 38236 | +38.66 |
| 1981 | 210759 | 73630 | +53.69 |
| 1991 | 278317 | 67558 | +32.05 |
| 2001 | 341473 | 63156 | +22.69 |
| 2011 | 376093 | 34620 | +10.14 |

Analysis of data reveals that in 1901, the population of the Dhule town was 24,726 souls, which increased to 3,51,367 by the year 2011. Of course, growth rate was not same each decade. The city has witnessed both positive and negative growth of population. In the first decade of 20th century the population of city increased with the rate of 22.71. In the succeeding decade (1911-21) the negative growth rate (-2.78) has been reported. Thereafter, the city recorded positive growth rate in each decade with highest of 53.69 in the decade 1971 -1981. From 1981 growth rate is decreasing continuously (Fig. 1).

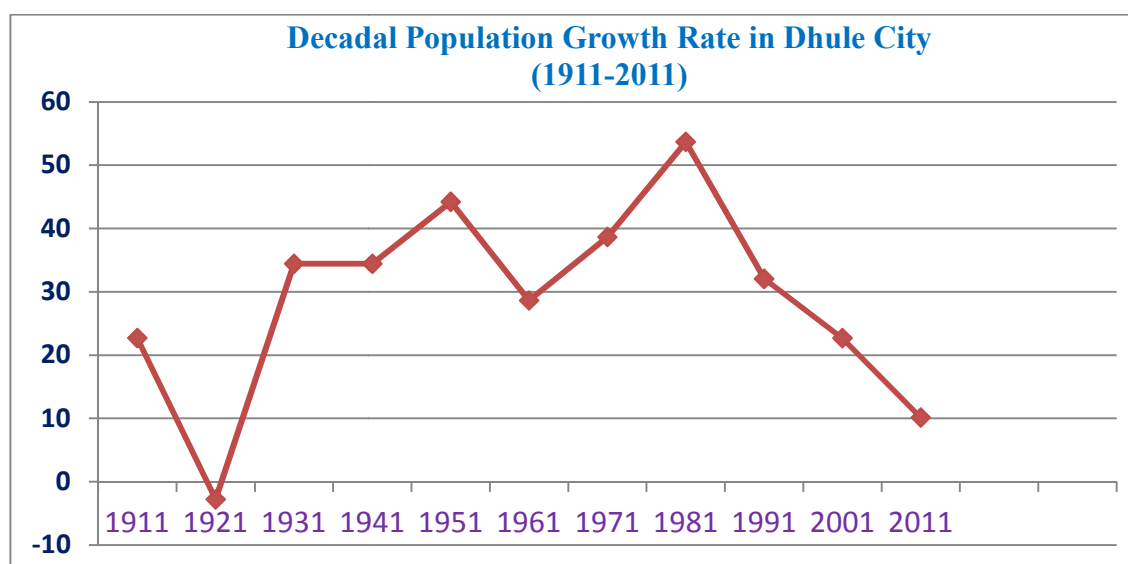


Figure 1

**LANDUSE ANALYSIS OF DHULE CITY**

Land use data provide factual base for identification of trend of development of the town or city, and extent of different types of users of land in the city and further give guide lines for the future planning. Land use is the function of land, what it is used for. Land use varies from area to area. In urban areas, land use pattern changes with time on a large scale. Along with the development of urban areas, the area under agriculture, forests or uncultivable land get transformed in to residential, industrial or any other category of urban land use. Sometimes, due to change in functional importance of area within the city, the residential areas get converted into commercial areas. Thus, as an impact of urbanization, the spatial and temporal changes occur in urban land use pattern.

Table: Land use in Dhule City, 1981 and 2011

| | Land use Category | 1981 | | | 2011 | | | Change from 1981 to 2011 | |
|-------------------------|-----------------------------|----------------|----------|----------|----------------|----------|----------|--------------------------|--------------------|
| | | Area (Hectors) | % to TGA | % to TBA | Area (Hectors) | % to TGA | % to TBA | Area (Hectors) | Change in % to TGA |
| 1 | Residential | 871.25 | 18.75 | 51.38 | 1284.58 | 27.65 | 56.14 | 377.29 | 8.9 |
| 2 | Commercial | 28.34 | 0.61 | 1.67 | 77.43 | 1.67 | 3.38 | 49.09 | 1.06 |
| 3 | Industrial | 94.04 | 2.02 | 5.55 | 78.36 | 1.68 | 3.42 | -15.68 | -0.34 |
| 4 | Pub. & Semi Pub. | 434.17 | 9.34 | 25.61 | 651.28 | 14.02 | 28.46 | 217.11 | 4.68 |
| 5 | Public Utility | 39.55 | 0.85 | 2.33 | 48.23 | 1.04 | 2.11 | 8.68 | 0.19 |
| 6 | Transport: Roads- Railways- | 194.73 | 4.19 | 11.48 | 136.70 | 2.94 | 5.97 | -85.23 | -1.84 |
| | | 27.20 | 0.59 | 1.60 | | | | | |
| 7 | Recreational | 6.38 | 0.14 | 0.38 | 11.80 | 0.25 | 0.52 | 5.42 | 0.11 |
| Total Built-up Area | | 1695.66 | 36.49 | 100.00 | 2288.38 | 49.25 | 100.00 | 592.72 | 12.76 |
| 8 | Agricultural | 1904.21 | 40.99 | | 1106.47 | 23.82 | | -797.74 | -17.17 |
| 9 | Vacant Land | 790.81 | 17.02 | | 995.83 | 21.43 | | 205.02 | 4.41 |
| 10 | Water Bodies | 255.32 | 5.50 | | 255.32 | 5.50 | | 00 | 00 |
| Total undeveloped area | | 2950.34 | 63.51 | | 2357.62 | 50.75 | | -592.72 | -12.76 |
| Total Geographical Area | | 4646.00 | 100.00 | | 4646.00 | 100.00 | | 00 | 00 |

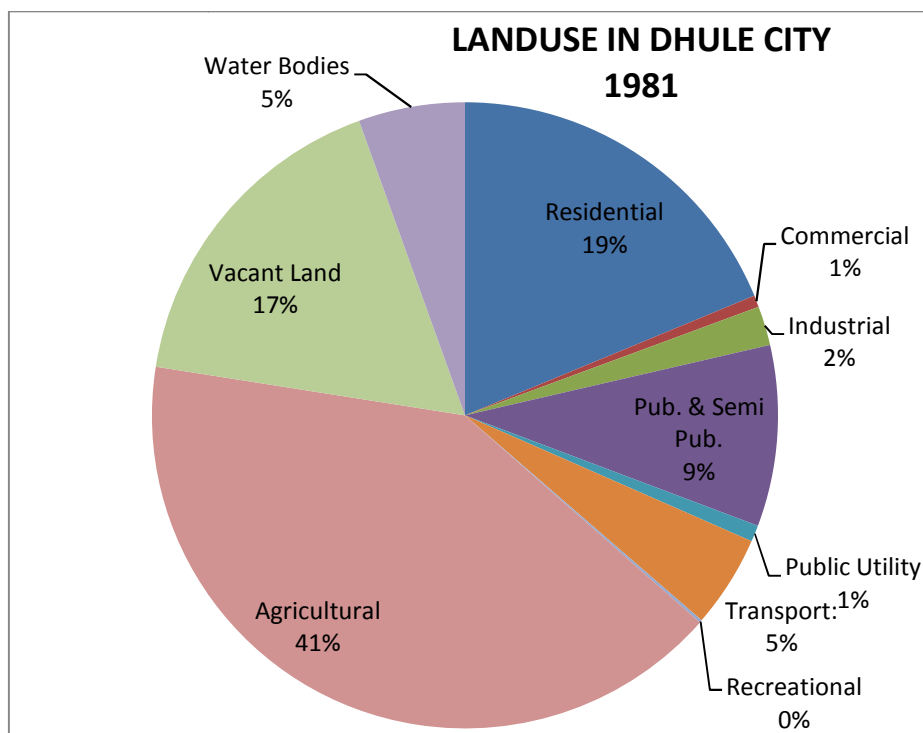


Figure 2

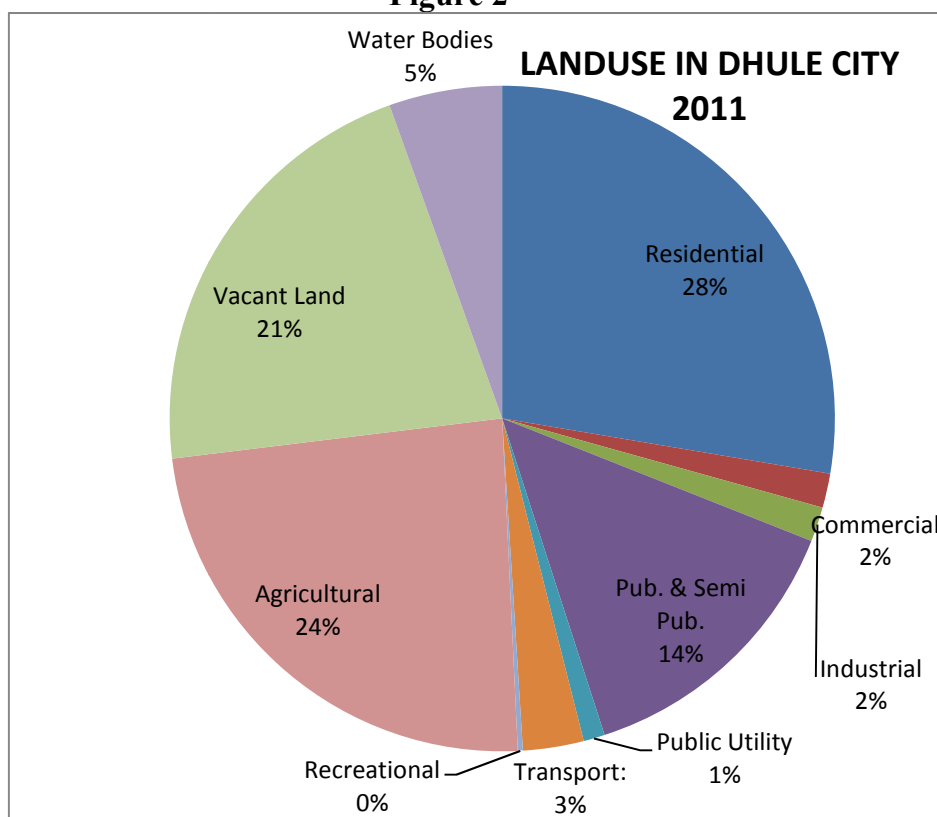


Figure 3

A) DEVELOPED AREA (BUILT UP AREA)

This category comprises area under residential, commercial, industrial use and also public and semi public sector. In 1981, out of the total area of the city (4646 hectors) about 1695.66 hectares or 36.49 percent area was under this category. In 2011 the city



area was unchanged while built up area increased upto 2288.38 hectares. It accounted for 49.25 percent of the total geographical area.

Residential Landuse

Residential landuse shares the considerable proportion of the urban land and it plays a significant role in shaping the urban morphology. In 1981, the existing residential areas were mainly concentrated in Old Dhule, Moglai, Deopur, Peth and nearby areas. About 871.25 hectares or 18.75 percent of the total geographical area of city was under residential use (Fig.2). It accounted for 51.38 percent of total built area. By the year 2011, the area under residential use increased up to 1,284.58 hectares (27.65 % of TGA) (Fig. 3). During the thirty years period many new colonies came into existence.

Commercial Landuse

In the last three decades Dhule city witnessed great changes in the field of commercial activities. Though the trade and commercial activities occupy comparatively very limited portion of the urban land, they play a significant role in the urban economy and ultimately the process of urbanization. During the year 1981, about 28.34 hectares of the city land was devoted to commercial use. It accounted for 0.61 percent of total geographical area and 1.67 percent of total built up area of the city. In thirty years period i.e. from 1981 to 2011, the area under this category increased by about 49.09 hectares. In 2011, total area under the commercial use was 77.43 hectares.

Industrial Landuse

Industrial activities play an important role in the urban economy. It is a close relationship between urbanization and industrialization. It works as a pull factor of urban population growth. Industries provide job opportunities and hence, many people get attracted towards industrially developed areas and settled there. Thus, Industrial growth causes rapid change in urban landuse pattern by occupying cultivable land, forest or barren lands for the establishment of industries and residents for factory workers. In Dhule city up to the year 1981 the industrial estates were spread over an area of about 94.04 hectares, which accounted for 2.02 percent of total geographical area. Percentage share of industrial sector in total built up area was about 5.55 percent. At that time, almost all the industries were concentrated in north and western parts of the city. In the later period Avadhan MIDC estate was established. It is situated in southern parts of Dhule city. This area is outside the city boundary. Many small scale and few medium and large scale industries are developed in this region. It is worthwhile to mention that many oil mills stopped their production due to certain causes. Therefore, areas under these mills get converted into residential or commercial use. Another point to be noted that nearby area of Starch Factory was also declared as industrial area. In the later period it is converted into residential use. Therefore, area under industrial use category within the city boundary reported negative change. Area under this category decreased up to 78.36 hectares by the year 2011. It accounted for 1.68 percent of total geographical area and 3.48 percent of total built up area of the Dhule city.

Public and Semi Public Sector

Government offices, Institutes, Hospitals and lands reserved by government for specific reasons all this area includes in the public and semi public sector. In 1981, area under this sector use was about 434.17 hectares or 9.35 percent of geographical area. Percentage share of this land use category in total built up area of the city was about 25.60 percent. In 2011 area under this category is increased up to 651.28 hectares.

**Area under Public Utilities**

Area under public utility comprises the area used for construction of water purification plants, overhead tanks (water supply), drainage, electricity supply stations, fire brigade stations etc. For the year 1981 the area occupied by public utilities is 39.55 hectares of total geographical area. It increased up to 48.23 hectares by the year 2011.

Area under Transport and Communication Facilities

This category includes the area occupied by Air ports, Bus Stand, Bus Depot, Railway Station, Roads, Railways, Communication Complexes, etc. In 1981 about 221.93 hectares of land or 4.78 percent of total geographical area was devoted to this land use category. Its share in total built up area of the city was 13.10 percent. In 2011 area under this category was about 136.70 hectares. It accounted for 5.97 percent area of total built up area. Area under this category diminished during the investigation period because of following reasons; In the previous DP report the air port area was included in the transport category. In the recent report this area is omitted from the city area under transportation, because, it does not come in municipal corporation boundary. In the former period certain city area was utilized for truck parking and terminus. In the later period most of such area has been come under residence and other uses. Therefore, area under transportation decreased considerably in the recent period.

Area under Open Spaces, Gardens, Plays and Fair Grounds

In 1981 the total area occupied by this land use category was about 6.38 hectares or 0.14 percent of TGA. Percentage share of it in total developed area of the city was 0.38 percent. That means there were very few open spaces, gardens, play and fair grounds. By the year 2011, area under this category increased up to 11.80 hectares or 0.25 percent of TGA.

B) Undeveloped Area

This category involves area under water bodies, wasteland and also agriculture and forests. In 1981, out of the total area of the city (4646 hectares) about 2950.34 hectares or 63.50 percent area was under this category. In 2011 the city area was unchanged while area under residential use and other categories increased. Therefore, area under the category of undeveloped area decreased up to 2357.62 hectares. It accounted for 50.75 percent of the total geographical area.

Area under Agriculture and Forest

In 1981 about 1904.21 hectares or 40.98 percent of the total geographical area was under agriculture and forests. Due to development of the city area under this category is decreasing continuously. As per 2011 land use records, about 1106.47 hectares or 23.82 percent of the total geographical area was under agriculture and forests.

Water Bodies

In Dhule city water bodies' occupied area was 255.32 hectares in 1981 and in 2011 too. The river Panzara and its few streams pass through the city. Nakane lake and Dedargaon lake are outside of the city.

Vacant and Barren Lands (Wastelands)

In 1981, about 790.81 hectares of land was occupied by vacant and barren lands. It accounted for 17.02 percent of total geographical area. Agriculture and forest area has used for the plotting to settlement and investment therefore vacant and barren land increase in last few years. According to 2011 land use records, about 995.83 hectares area lies under this category or 21.43 percent of the total geographical area is under vacant and barren lands.

**CONCLUSION**

In 1901, the population of Dhule city was only 24726. It increased upto 376093 by the year 2011. During 110 years period the city witnessed both positive and negative changes in population. In the second decade of 20th century the population of city was decreased. In 1951, total geographical area of the city was 24.75 sq.km. In 1961-1971 city area was 26.75 sq.km. In 1981 city area increased up to 46.46 sq.km. Out of this, about 36.50 percent area was developed and remaining 63.50 percent was non-developed from the urban point of view. During the year 2011 also, total area of Dhule city is 46.46 sq.km. Of which 49.25 percent area was developed and 50.75 percent area was non-developed. During thirty years period, total built up area increased by about 592.72 hectares (2288.38-1695.66). It means, various chances are available for development of city. Area under residential uses increased from 871.25 hectares in 1981 to 1284.58 hectares in 2011. That means the residential area increased considerably. The city also reported rapid growth of commercial, public and semi-public sectors and other urban landuse categories. During 30 years period number of new colonies came into existence. New residential belt developed along the Surat bypass highway and beyond the Walwadi-Wadibhokar village in Deopur area. At the time of 1981, considerable area of west, north-west, and southern sector of the city was under agricultural use. In the last few years most of its part transformed into residential or public and semi public zone.

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