An analysis urban concentration using Gini index: A Study on Nashik District of Maharashtra

1 Bharat L. Gadak, 2Ravindra G. Jaybhaye,
1Assistant professor, 2Professor,
1Department of Geography, 2Department of Geography,

Email - bharatgadak@hotmail.com
2Department of Geography Savitribai Phule pune University, Pune-07.

Abstract: Urbanization means the numbers of people living in towns and cities is growing rapidly all over the world. Urbanization is the spatial concentration of people and economic activity. Degree of urbanization is most common indicator its used for the measurement of urbanization is the proportion of people living in urban area. The Nashik district is located in northern part of Maharashtra. The using census population data of 1901 to 2011 and Gini concentration index. The degree of the inequality has been measured numerically through Gini concentration index. When the entire urban population is concentrated at a point the Gini concentration ratio becomes unity 1.000 Lower values of the ratio, thus imply a more uniform distribution of urban population. It observed that 0.33 in 1901 and after it attained ups and down from 1921 and 1991. Highest Gini concentration ratio has observed 0.76 in 2011 and lowest ratio has observed 0.31 in 1921 than other years.

Key Words: Urbanization, Concentration, Nashik District, Gini index.

1. INTRODUCTION:
Urbanization means the numbers of people living in towns and cities is growing rapidly globally. It is a multifaceted process from the country to town, which includes the noticeable changing process, such as transition, centralization, intensification, and differentiation of population and non-agricultural activities to the cities and towns, but also includes the city's economic demographics, social and technological diffusion in the hierarchy of cities and into rural areas (Zhou, 2003; Liu, 2004; Wang et al., 2006). It is a shift from traditional agricultural society to a modern society which focuses on manufacturing industries and services (Jin et al, 2016). Urbanization can be defined as “as a process which reveals itself through temporal, spatial and sectorial changes in the demographic, social, economic, technological and environmental aspects of life in a given society. All places with a municipal corporation cantonment board or notified are committee as treated as urban. In add that places which have a minimum population of 5000,75 percentage of their male working population engaged in non-agricultural activities and density of population of at least 400 persons per sq.km (census,2011) Urbanization level is a significant indicator of urbanization (Zeng and Jiang, 2000; Zhou, 2003; Chen et al,2008). Urbanization is, the spatial concentration of people and economic activity (Roberts and Kanaley, 2006) can simply be defined as the transformation of a rural society into an urban society and is a result of socio-economic and political growth leading to formation and expansion of urban agglomerations and city centers along with changing rural institutions, organizations and land use pattern (Bhaskar,2012). Urbanization does not take place in the thin air. It requires enormous amount of land. Cities mushroom-doubling their built-up areas every 15-20 years. In the less developed parts of the world cities e.g. Mexico City, Jakarta, Sao Paulo, Bangkk, and Mumbai are converting between 3000 to 5000 hectares of rural land to urban land uses each year. In India in terms of sheer scale of urbanization, the situation is a class apart from most other countries. In India, the urban population was forecasting to grow from 150 million to 220 million during the decade 1981-1991. By the year 2001-2011, the numbers of urban residents will have increased by 160 million, more than double the 1981 total. Keeping in mind the space of urban growth and transformation in land use, the World Bank had estimated that some 600000 hectares of rural land would be transformed into urban uses over two decades which would be enough to accommodate 29 new cities the size of Mumbai. However, developing countries are becoming wealthier and more urban, bringing their consumption levels closer to those of the developed world. As a result they are fast becoming significant contributors to the global problems of resource depletion and climate change. In the cities of the developing world, where population growth has put paced the ability to provide vital infrastructure and services, the worst environmental problems are experienced with severe economic and social impacts for urban residents like inadequate household water supplies, waste accumulation, unsanitary conditions etc. cities in the developing country are also experiencing the worst urban air pollution as result of rapid industrialization and increased motorized transport.
2. STUDY AREA:

Nashik District is located between 18.33 degree and 20.53 degree North latitude and between 73.16 degree and 75.16 degree East Longitude at Northwest part of the Maharashtra state, at 565 meters above mean sea level. The district Nashik is extent an area of 15,582 sq. kms. It is enveloped by the Dhule district in the north, Jalgaon in the east, Aurangabad in the south east, Ahmadnagar to the south, Thane in the southwest, Valsad and Navsari districts of Gujarat to the west and The Dangs to the northwest. As per 2011 census the population of district is 61,07,187 which is 5.43 per cent of the total population of Maharashtra. The district involves 15 tehsil namely, Igatpuri, Sinner, Nashik, Peint, Trimbak, Surgana, Baglan, Kalvan, Deola, Malegaon, Chandvd, Dindori, Niphad, Yeola and Nandgaon. They consist 1587 villages and 25 towns in which 11 are statutory towns and 7 census towns. Only 10 tahsil namely Igatpuri, sinner, Nashik, trimbak, surgana, Satana, Malegon, Chnadvad, Yeola, Nandgaonare as urban in character. Remaining 5 tahsil Peint, Kalvan, deola, Dindori, Niphad etc. totally as a rural in character. The total Nashik district population living in rural areas is 3,509,814 of which males and females are 1,804,712 and 1,705,102 respectively. Urban Population is 58.67 % Nashik is the fourth largest city in Maharashtra in terms of population.

Fig no 01 Location map of study region
3. DATA AND METHODOLOGY:

Methodology is one of the significant parts of analysis. Output or result of analysis highly depends on the methodology will be used for the data processing or analysis purpose. To achieve the above objective following methodology will be adopted:

- Step -I Primary data was collected; exhaustive literature survey of the topic of investigation is to be undertaken. Published literature, reports was collected from various libraries, Institutes and government departments etc. Besides this relevant literature were also reference books, bulletins, reviews also be etc.by obtained through Internet (Gadakh and Jaybhaye, 2015, 2016).
- Step -II collection of the population data from 1901 to 2011 of the Nashik district
- Step –III to calculate the Gini Concentration.

- Techniques:
  1. Gini Concentration Ratio:

   The degree of the inequality has been measured numerically through Gini concentration index. When the entire urban population is centered at a point the Gini concentration ratio becomes unity 1.000 Lower values of the ratio, thus imply a more uniform distribution of urban population. Its value lies between Zero and 1. Zero denotes complete equality, whereas, 1 denotes complete inequality.

   A co-efficient of urban concentration can also be computed with the help of Gini Concentration Ratio.

   The formula to compute the ratio as following ; (Chandna, 2004)

   \[ G_j = \left( \frac{\sum_{i=1}^{n} X_i Y_i}{\sum_{i=1}^{n} X_i + Y_i} \right) \left( \frac{\sum_{i=1}^{n} X_i + Y_i}{\sum_{i=1}^{n} Y_i + 1} \right) \]

   Where:
   - \( G_j \) refers to the Gini concentration
   - \( X_i \) refers to cumulative proportion of population
   - \( Y_i \) refers to cumulative proportion of units
   - \( n \) refers to the number of class intervals

   When the entire urban population in concentrated at one point, the Gini concentration ratio become unity 1.000. Lower values of the ratio, thus imply a more uniform distribution of urban population

   Gini concentration can be computed as under:
   - The method of computing Gini concentration ratio whereby such a ratio for persons living in urban places of various size categories.
   - In this calculation requires the filling in respective data of urban places in terms of their number and population
   - The computation of proportion of numbers and population in each size category assuming the number and population as unity
   - The cumulative proportion of numbers and population
   - The multiplication of first value in numbers and second value in population
   - To find out the difference between the sums of the values
   - This difference is the Gini concentration ratio or co-efficient of urban concentration.

4. RESULT AND DISCUSSION:

Degree of urbanization is most common indicator its used for the measurement of urbanization is the proportion of people living in urban area (GOG, 2003).

- Classification of town:

  Urban settlements are classified based on the population size and functions. An urban settlement is classified as urban hamlet, urban village, town, city, metropolis and conurbation and mega police based on population size. The United Nations and The census of India have classified the towns under the following six categories:

<table>
<thead>
<tr>
<th>Table No: 01 classification of town</th>
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<tbody>
<tr>
<td>Size of class</td>
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<tr>
<td>Class I</td>
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</table>
Every town has its specific function. As per functions the town can be classify as administrative, centers, industrial towns, mining towns, transport towns, port centers, defense centers, Market centers, commercial centers, tourist centers, cultural centers and diversified functions.

- Spatio-temporal Distribution of urban Centre:
  In the regional development towns and cities are essential part and from them infiltrates to their peripheral areas. In Nashik district Historical, social, Economic, Cultural background is one of the exclusive characteristics in study area there are also some variations in the growth of urban areas. Table 02 shows the classification of town in Nashik district

<table>
<thead>
<tr>
<th>Year</th>
<th>Class III (0-9,999)</th>
<th>Class IV (10,000-19,999)</th>
<th>Class V (20,000-49,999)</th>
<th>Class VI (50,000-99,999)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>2</td>
<td>4</td>
<td>8</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>2011</td>
<td>2</td>
<td>4</td>
<td>8</td>
<td>5</td>
<td>0</td>
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Table No 03: Class wise population in Nashik district

<table>
<thead>
<tr>
<th>Year</th>
<th>Class I (less than 5000)</th>
<th>Class II (5000-99,999)</th>
<th>Class III (10,000-19,999)</th>
<th>Class IV (20,000-49,999)</th>
<th>Class V (50,000-99,999)</th>
<th>Class VI (100,000-149,999)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>13</td>
<td>2</td>
<td>4</td>
<td>8</td>
<td>5</td>
<td>0</td>
<td>25</td>
</tr>
<tr>
<td>2011</td>
<td>13</td>
<td>2</td>
<td>4</td>
<td>8</td>
<td>5</td>
<td>0</td>
<td>25</td>
</tr>
</tbody>
</table>
**Fig No 03 Regression analysis of population and town**

Gini concentration Index:

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</tr>
</thead>
<tbody>
<tr>
<td>Index</td>
<td>0.33</td>
<td>0.43</td>
<td>0.31</td>
<td>0.40</td>
<td>0.40</td>
<td>0.48</td>
<td>0.55</td>
<td>0.57</td>
<td>0.60</td>
<td>0.52</td>
<td>0.71</td>
<td>0.76</td>
</tr>
</tbody>
</table>

It observed that 0.33 in 1901 and after it attained ups and down from 1921 and 1991. Highest Gini concentration ratio 0.76 observed in 2011 and lowest ratio observed 0.31 in 1921 than other years.

**5. CONCLUSION:**

After discussing all the part of the paper it is clear indicated the level of urbanization of Nashik district is very rapid. The analysis of urbanization trend and level in different census it was told that the shared of urban population was very high but the rate of urbanization was level down in 1991 after this census the rate become suddenly increase. In the spatial analysis of urbanization it was found that the Nashik and Malegaon city. In some urban center are growing very slow due to urbanization was most of the population depends on agriculture and rate of industrialization. It was examined that Nashik and Malegaon town has most concentrate of the urban population.it was clearly indicated that the people attracted the main city of district. It is suggest that government authorizes should take some steps for the development of small urban region.
6. Acknowledgement:

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REFERENCES: