Original Article

# TEMPORAL CHANGES IN DEMOGRAPHY OF HARYANA- NCR SUB-REGION

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**ABSTRACT**

*Haryana NCR sub-region has witnessed a dynamic change in the growth of population, economic activities, residential growth and reduction in agricultural land in the last two decades. This region witnessed a higher population growth (27.47%) as compared to Haryana (19.9%) in general during 2001-2011 which is on account of high rate of urbanization in this region. High growth of urbanization has resulted in dramatic changes in land use in the region. The present study is an attempt to elaborate and show the demographic changes in Haryana NCR sub-region in the last decade (2001-2011) by computing the composite index and mapping of the distribution pattern/changes in demography with the help of Arc GIS (10.3) software. The data has been used at the tehsil level and the tissues having the lowest composite index indicated the highest level of demographic development, while those having the highest composite index indicated the lowest level of demographic development. The Map shows that tehsils having composite value in the range below 86.4 are highly developed with the highest degree of demographic change. Tehsils that have composite values in the range 86.4 to 100 indicated the low degree of development and demographic change. The tehsils with the composite index of more than 100 experienced the lowest demographic change and subsequently low demographic development. The urbanization had the positive correlation (0.83) with demographic development. On the other hand, female work force, total population growth, sex ratio and female literacy show correlation values 0.49, 0.43, 0.27 and 0.13 respectively. The proportion of non-agricultural workers to total workers indicated negative correlation value (-0.06) with demographic development.*

*KEYWORDS: Demographic Development, Composite Index, Mapping, Arc GIS & NCR*

## INTRODUCTION

In demographics, population is the total number of humans living on earth. Population is one of the most essential governing factors in a society. It affects the social, economic, cultural, political, and historical conditions prevailing in a society and in turn is regulated by them. *(*Spengler *et.al.,* 1968*)* India is having 1.28 billion population contributes 18% to the total population of the world (Census of India, 2011). Relatively, countries with a large population base face different challenges as opposed to the countries with a smaller population base. The developed nations as compared to developing nations, they are having a huge population base over their geographical area that affects the socioeconomic growth of these countries, therefore the Human Development Index (HDI) is low. Certainly, studies relating to the changes in the demographic characteristics of an area are of a great significance to developing nations like India.

In India, Haryana contributes to 2.9 percent of the country's total population over 1.4 percent of its geographical area. There have been significant changes in the size, structure and composition of population in Haryana. Thus, the present paper tries to identify and analyze the demographic changes in Haryana on the basis of the composite index. In the present study, an attempt has been made to analyze the demographic changes in the

Haryana National Capital Region (NCR) sub-region. The study assesses the distinguished demographic characteristics of the state and demarcates the state into regions on the basis of population dynamism. (Goel*, 2014*) Demographic studied parameters were population growth, urbanization level, female literacy rate, female work force, sex ratio and proportion of non-agricultural workers to total workers (Gosal and Krishan, 1979).

## MATERIALS AND METHODS

### Study Area

Haryana is well developed due to its proximity to Delhi NCT. Haryana is a state located in the northwestern region of the country with a population base of approximately 1.9% of the country's population. National Capital Region (NCR) constitutes about 1.6% of the country's total land area. However, in the study, Haryana NCR sub-regions are only selected. These sub-regions include the nine districts of Haryana, namely Faridabad, Gurgaon, Mewat, Rohtak, Sonipat, Panipat, Rewari, Jhajjjar and Palwal. These nine districts together cover about 13,428 sq. km or 39.3% of total NCR.

### Data Source

For the present study, the data are collected from the statistical abstract of Haryana, Census 2001 and 2011, and Statistical Handbooks of Haryana's districts during the period 2001 and 2011. The study analyzes the data collected from varied sources using different statistical and cartographic techniques. (Suzanchi and Kaur, 2011).

### Methods

- Analyzing the collected data and calculating the index numbers for all the demographic parameters at the tehsil level.
- Arranging the index numbers in a descending order and assigning them the weightage using different ranges. The formula used for calculating the index number  is

$$I = \frac{V_t}{V_{t0}} * 100 \tag{1}$$

Where $I$ am the Index, $V_t$ is the value at the current time and $V_{t0}$ is the value at base time. And the formula for Composite Index is

$$\hat{I} = \frac{\sum I_i W_i}{\sum W_i}(i=1, 2,3,\ldots\ldots n) \tag{2}$$

Where $\hat{I}$ is the Composite Index, $I_i$ is the index value for different demographic development parameters and $W_i$ is the weightage given to the index values. After calculating index numbers, the index numbers were categorized into four categories and ranges/weight ages were assigned to them. The composite index was computed by using index value and ranges/weight ages assigned to them. Then the composite index values were further categorized and a demographic development level map has been generated with the help of Arc GIS (10.3) Software.

## RESULTS AND DISCUSSIONS

### Demographic Changes

Results indicate that tehsils having the lowest composite index indicated the highest level of development and those having the highest composite index indicated the lowest level of development. According to the data counted, the Israna tehsil of Panipat district has the composite index of 75.54, which shows the overall demographic development in the tehsil during the study period. It is the most developed tehsil amongst other tehsils, such as Gurgaon, Sampla, Rewari,

Mewat, and Jhajjar. On the other hand, the Gurgaon tehsil of Gurgaon district has the highest composite index of 119.04, which thereby shows least development in the tehsil during this period.

After assigning ranges to the index numbers and computing the composite index, it is determined that the tehsils having composite value in the range below 86.4 is the highly developed tehsils with the highest degree of population change as opposed to tehsils that are on the other end of the scale. Tehsils that have composite values in the range 86.4 to 100 indicate the low degree of development and population change. The tehsils with the composite index of more than 100 experience the lowest population change and subsequent demographic development. In the results, the urbanization had the positive correlation (0.83) and was followed by female work force (0.49) and total population growth (0.43) in the context of level of demographic development. On the other hand, sex ratio, female literacy showed correlation values 0.27 and 0.13 respectively. The proportion of non-agricultural workers to total workers indicated negative correlation value (-0.06).

**Population Growth and Urbanization Level**

The highest population growth has been recorded in the Gurgaon, Manesar, Punhana, FirozpurJhirka, and Faridabad tehsils of the NCR region as given in Table 1. These tehsils are industrially advanced that attract a large number of migrant workforces from the other parts of the state or country and provide better employment opportunities and livelihood.There has been considerable improvement in the urbanization level in two tehsils (Gurgaon and Manesar) of Gurgaon; four tehsils (Gohana, Ganaur, Sonipat and Kharkhoda) of Sonipat; two tehsils (Jhajjar and Bahadurgarh) of Jhajjar and one tehsil (Sampla) of Rohtak district primarily due to the industrialization and better employment opportunities and their geographical proximity to national highways as shown in Figure 1.

**Female Literacy Rate, Sex Ratio and Work Force Composition**

It is clearly seen that the female literacy rate and urban industrial development is low in the tehsils Punhana, FirozpurZirka, Nuh and Taoru of Mewat districtas seen in Figure 1 and Figure 2. As these tehsils are backward and have poor cultural and socio-economic conditions with the majority of population of Meo-muslims, the degree of change recorded is low. However, the population growth is high in these tehsils (Goel,2014*).*The participation of female work force in various economic activities has gone down significantly in a decade since 2001 to 2011as shown in Figure 3. The decline in work force is attributed to the conversion of agricultural land into other commercial purposes and hence decline in agricultural work. Most of the rural women are engaged earlier in the agricultural and allied activities are now rendered jobless in urban areas. The highest female workforce was found in Kosli tehsil in 2001 and now it has drastically reduced in a decade period. At the same time, there is good hope from Faridabad tehsil as it records positively high population of female work force in 2011 as compare to 2001. In other tehsils the trend followed a decline in comparison to 2001. The reason of higher growth in Faridabad could be migration of persons from other part of Haryana and nearby states. The results show that sex ratio was found to be highest in case of Kosli tehsil followed by FirozpurZirka and Punhana as depicted in Figure 4. The trend was opposite in case of Gurgaon, Manesar and Sampla tehsils of Haryana NCR Sub-region. The similar findings were also reported in case of other tehsils and no observable difference was noticed.

The proportion of non-agricultural workers to total workers was found relatively higher in big cities or towns like Gurgaon followed by Faridabad and Manesaras illustrated in Figure 5, while in small cities or towns like Israna, FirozpurZirka and Beri the lowest proportion was observed. The lowest proportion in these tehsils were on account of lack of industrialization in comparison to big cities or towns, lack of economic opportunities in secondary and tertiary sectors

and out migration from small cities or towns of working population to big cities or towns. The results conformity is based on the findings of primary data which was collected for the study.

**Demographic Development**

The Israna, Maham, Sampla, Jhajjar, Matenhail, Kosli, Manesar, Taoru and Ballabhgarh tehsils were found to be highly developed demographically in the study period as illustrated in Figure 6. The nearby distance from big cities or district head-quarter, distance from National Highways and increment in industrialization is the main reason of the high development in these tehsils. The tehsils named Ganaur, Kharkhoda, Bahadurgarh, Beri, Pataudi and Hodal were already developed before the study period. So the level of demographic development is medium in these tehsils. On the other end, the demographic development level of the remaining tehsils found low. The development level of all tehsils in the map is based on their composite index values.

## CONCLUSIONS

From the study, it is concluded that the tehsils having the lowest composite index indicated the highest level of demographic development and those having the highest composite index indicated the lowest level of demographic development. After assigning ranges to the index numbers and computing the composite index, the composite index values were categorized and a map was generated. On the map, it is determined that the tehsils having composite index value in the range below 86.4 is the highly developed tehsils with the highest degree of demographic change as against those tehsils that having the highest composite index value. Tehsils that have composite values in the range 86.4 to 100 indicated the medium degree of development and demographic change. The tehsils with the composite index of more than 100 experienced the lowest demographic change and subsequently demographic development. The urbanization had the positive correlation (0.83) with demographic development. On the other hand, female work force; total population growth; sex ratio and female literacy show correlation values 0.49, 0.43, 0.27 and 0.13 respectively. The proportion of non-agricultural workers to total workers indicated negative correlation value (-0.06) with demographic development.

## ACKNOWLEDGEMENTS

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# APPENDICES

### Table 1: Population Growth in Different Tehsils of Haryana-NCR Sub-Region

| S. No. | District | Tehsils | Area (sq. Km.) | Population 2001 | Population 2011 | Population Growth (%) |
|---|---|---|---|---|---|---|
| 1. | Sonipat | Gohana | 803 | 339902 | 372034 | 9.45 |
| 2. | | Ganaur | 299 | 175787 | 206889 | 17.69 |
| 3. | | Sonipat | 763 | 602896 | 710183 | 17.80 |
| 4. | | Kharkhoda | 266 | 160590 | 160895 | 0.19 |
| 5. | Panipat | Panipat | 519 | 597382 | 791634 | 32.52 |
| 6. | | Israna | 331 | 122006 | 108196 | -11.32 |
| 7. | | Samalkha | 451 | 248061 | 305607 | 23.20 |
| 8. | Jhajjar | Beri | 411 | 135423 | 155791 | 15.04 |
| 9. | | Bahadurgarh | 511 | 362224 | 403746 | 11.46 |
| 10. | | Jhajjar | 817 | 382425 | 258595 | -32.38 |
| 11. | | Matenhail | N.A. | 121752 | 140273 | 15.21 |
| 12. | Rohtak | Maham | 513 | 181346 | 203050 | 11.97 |
| 13. | | Rohtak | 928 | 758782 | 734328 | -3.22 |
| 14. | | Sampla | N.A. | 116881 | 123826 | 5.94 |
| 15. | Rewari | Rewari | 991 | 543710 | 642872 | 18.24 |
| 16. | | Kosli | 270 | 110965 | 127410 | 14.82 |
| 17. | | Bawal | 265 | 110676 | 130050 | 17.51 |
| 18. | Faridabad | Faridabad | 422 | 1178007 | 1594839 | 35.38 |
| 19. | | Ballabhgarh | 321 | 187458 | 214894 | 14.64 |
| 20. | Palwal | Palwal | 632 | 404136 | 506253 | 25.27 |
| 21. | | Hodal | 377 | 221118 | 267440 | 20.95 |
| 22. | | Hathin | 359 | 203867 | 269015 | 31.96 |
| 23. | Mewat | Punhana | 290 | 206858 | 291978 | 41.15 |
| 24. | | FirozpurJhirka | 522 | 243868 | 343406 | 40.82 |
| 25. | | Nuh | 464 | 212855 | 287101 | 34.88 |
| 26. | | Taoru | 225 | 126169 | 166778 | 32.19 |
| 27. | Gurgaon | Gurgaon | 739 | 629508 | 977337 | 55.25 |
| 28. | | Manesar | N.A. | 81049 | 116606 | 43.87 |
| 29. | | Farukhnagar | N.A. | 109365 | 134848 | 23.30 |
| 30. | | Sohna | 337 | 140074 | 165629 | 18.24 |
| 31. | | Pataudi | 178 | 100957 | 120012 | 18.87 |

(**Source:** *Census of India 2001 and 2011)*
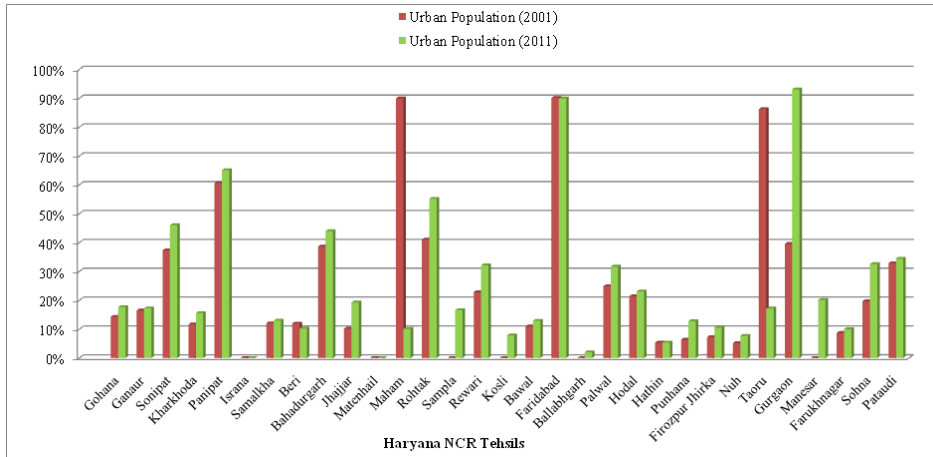
**Figure 1: Development in Urbanization Level in 31 Tehsils of
Haryana NCR Sub-Regions from 2001 to 2011**
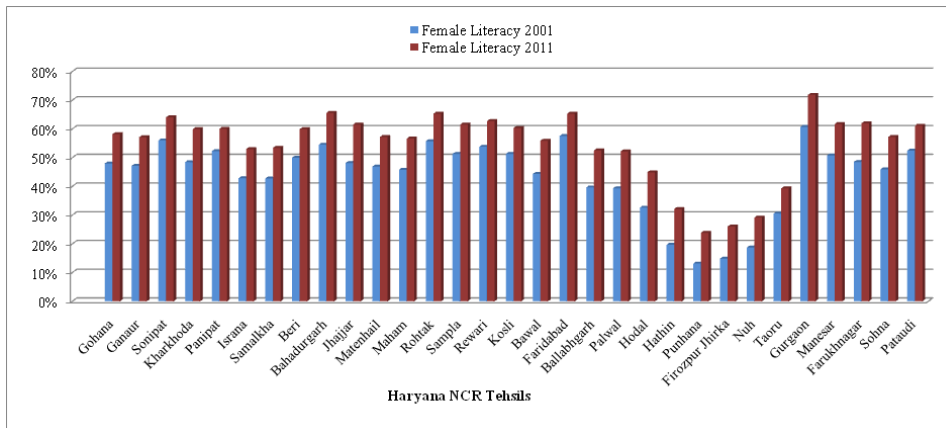
(**Source:** *Census of India, 2001 and 2011*)



**Figure 2: Female Literacy Level in 31 Tehsils of Haryana
NCR Sub-Regions from 2001 to 2011**
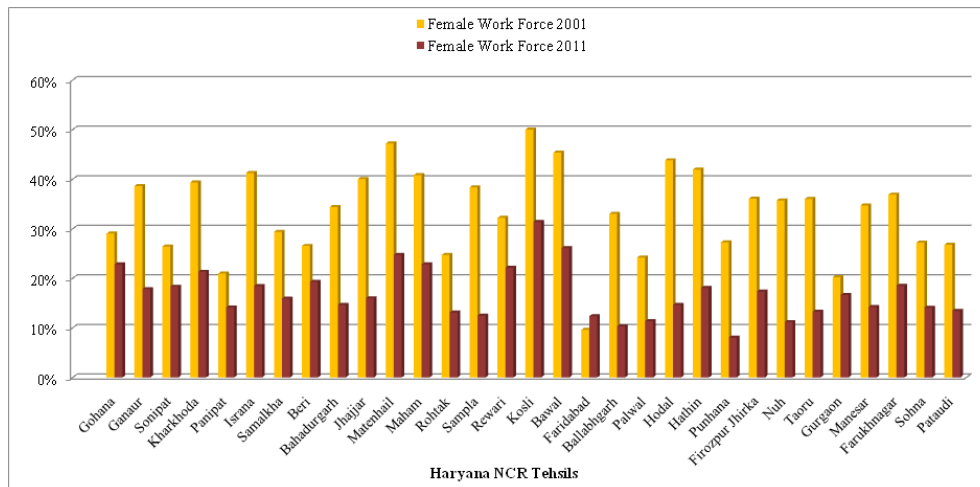
(**Source:** *Census of India 2001 and 2011*)



**Figure 3: Female Work Force in 31 Tehsils of Haryana
NCR Sub-Regions from 2001 to 2011**

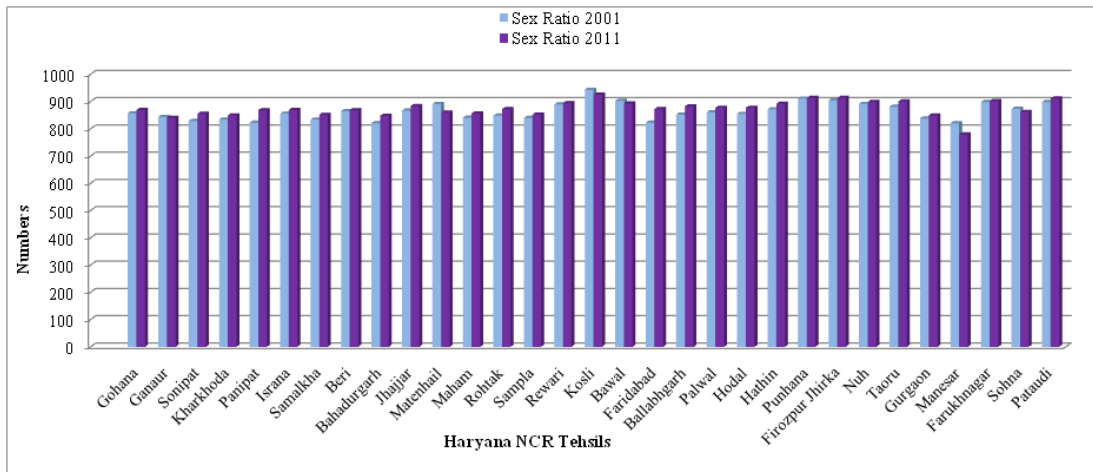(**Source:** *Census of India 2001 and 2011*)

**Figure 4: Sex Ratio in 31 Tehsils of Haryana
NCR Sub-Regions from 2001 to 2011**

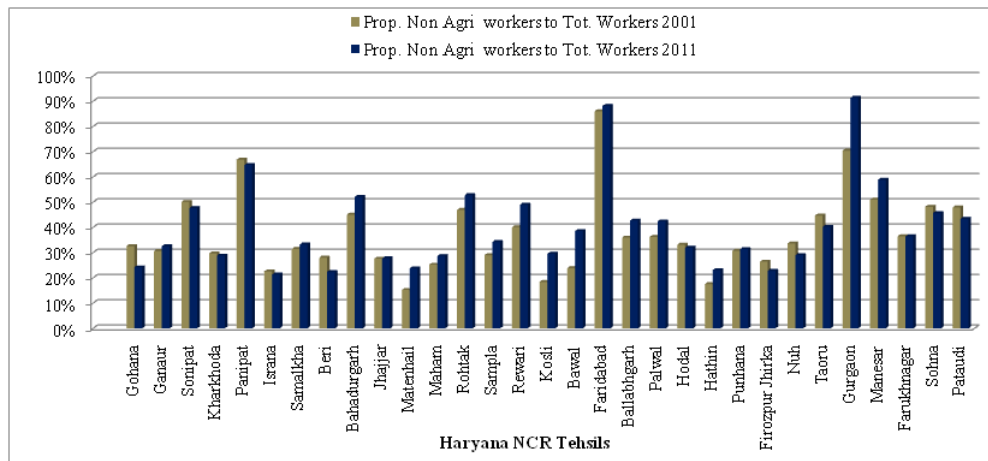(**Source:** *Census of India 2001 and 2011*)



**Figure 5: Proportion Non-Agricultural Workers to Total Workers in 31
Tehsils of Haryana NCR Sub-Regions from 2001 to 2011**

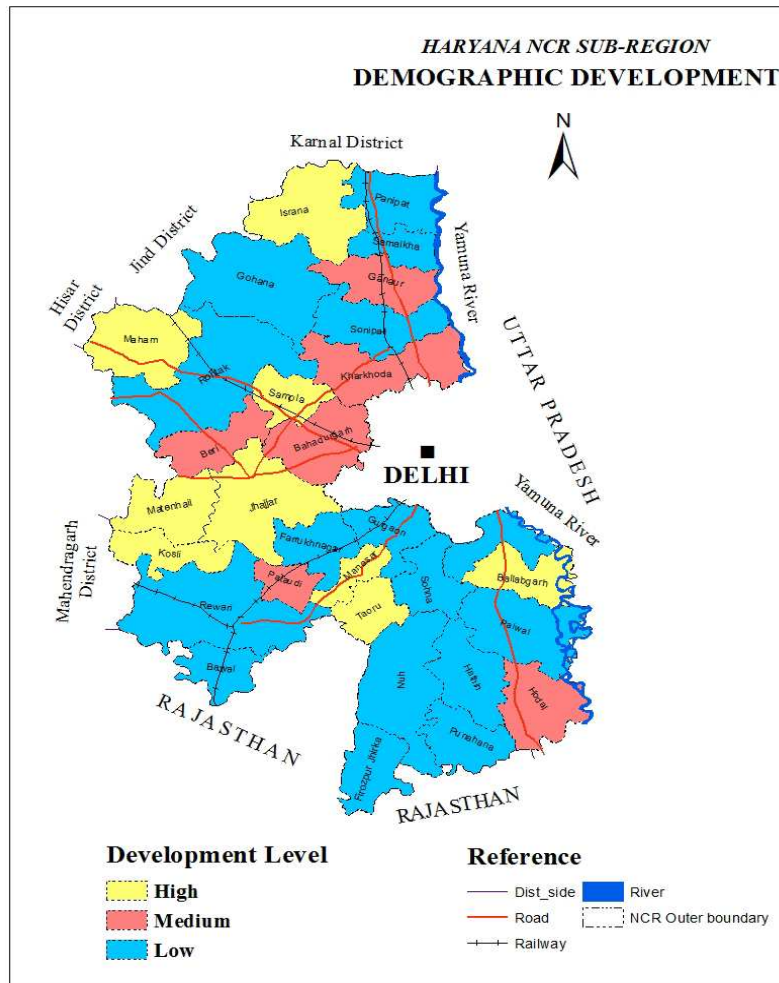(**Source:** *Census of India, 2001 and 2011*)

**Figure 6: Demographic Development in Haryana NCR Sub-Region from 2001 to 2011**