

Population Growth and Decadal Variations in Rohtak City: A Spatio-Temporal Analysis

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Abstract

Rohtak is the administrative headquarters of the division, district and tahsil of the same name and the third largest city of Haryana state. Though the growth of population in the city varies from decade to decade, but the population figures for the city as a whole show continuous increase since 1901 to 2011. The present study is a modest attempt to describe the growth of population and decadal variations in Rohtak city. The growth rate of population varies from decade to decade, but the population figures for the city as a whole show continuous increase since 1901 to 2011. The total population of Rohtak grew from 20,323 in 1901 to 3,74, 292 persons in 2011 registering an increase of more than 18 times during this span of 110 years (1901-2011). It means the city's population has increased by 1841.72 per cent during this period.

All the relevant data meant for the purpose have been obtained from various publications of Census of India. The map prepared by Municipal Corporation Rohtak (MCR) (2011) showing ward boundaries has been adopted as the base map and the ward has been chosen as the unit of analysis. Spatially speaking, the wide variations in the rate of population growth have been experienced at the ward-level. The highest growth rate has been recorded in Ward No. 9 (178.50 per cent) and the lowest in Ward No. 30 (-21.60 per cent).

Key Words: Population Growth, Urbanisation, Land Use, Land Cover, Remote Sensing, GIS.

Introduction

Population growth is the most fundamental demographic processes with which all other demographic attributes are directly or indirectly associated. Population growth affects density,

distribution pattern and composition of population. Therefore, an understanding of the process of population growth is essential. The concept of population growth is often used to note the change in the number of inhabitants of a territory during a specific period of time, irrespective of the fact, whether the change is negative or positive.

As per Census of India 2011, out of a total of 154 towns, one city, viz. Faridabad has emerged as the only million-plus city of Haryana and contains 15.99 per cent urban population of the state. A total of 19 cities are identified as class-I cities containing 52.03 per cent urban population. Out of 19 cities, Rohtak is one of these class one cities, which is having more than 3.7 lakh population according to 2011 census. The population of Rohtak grew from 15,699 in 1881 to 3,74,292 persons in 2011. It means the city's population has increased more than 23 times during this span of 130 years (1881-2011). The present study is a modest attempt to describe the growth of population and decadal variations in Rohtak city.

Objective of the Study

The two-fold objectives of the present study are as follows:

1. To describe growth of population and decadal variations in time perspective.
2. To analyse the spatial patterns of population growth in Rohtak city.

Study Area

The city of Rohtak with an area of 108.06 km.² has a sub-tropical location lying about 600 kms. North of the Tropic of Cancer. It is located at 28° 54' N latitude and 76° 35'E longitude, 77 km to the north west of Delhi, National Capital and 235 km south of Chandigarh, the common capital of the states of Punjab and Haryana and the Union Territory of Chandigarh. Rohtak is the administrative headquarters of the division, district and tahsil of the same name and the third largest city of Haryana state. The city has displayed the signs of the processes of concentration, centralization, deconcentration, decentralization, residential segregation, invasion and succession in its operation to complete the historicity. These processes have contributed essentially to the growth of urban population in temporal and spatial perspectives.

Data Base and Methodology

The study is mainly based on the secondary sources of data. Data have been obtained from the office of Director of Census Operations, Haryana, Chandigarh along with the publications made by the Office of the Registrar General & Census Commissioner, India, New Delhi. Some relevant data meant for the purpose have also been obtained from previous years' publications of the Census of India. The reference year for the secondary data is 2011. The ward has been chosen as the unit of analysis.

Both qualitative and quantitative methods have been applied for the data analysis. The most important among them are the tables and choropleth method used for the preparation of maps. On calculating population growth rates, the wards of the city have been classified into various categories (keeping in view the city's average) and represented cartographically so as to present a regional perspective, showing spatial patterns of population growth in Rohtak city. The map prepared by Municipal Corporation Rohtak (MCR) (2011) showing ward boundaries has been adopted as the base map.

Growth of Population in Rohtak City

Rohtak city is characterized by a chequered demographic history, more so during the present century. The growth rate of population varies from decade to decade, but the population figures for the city as a whole show continuous increase since 1901 to 2011 (Table 1 and Fig. 1).

Table 1: Rohtak City: Growth of Population and Decadal Variation (1901-2011).

Census Year	Total Population	Decadal Growth	
		Absolute	Per cent
1901	20,323	-	-
1911	20,361	+38	+0.19
1921	25,240	+4,879	+23.96
1931	35,235	+9,995	+39.60
1941	48,148	+12,913	+36.65
1951	71,902	+23,754	+49.34
1961	88,193	+16,291	+22.66
1971	1,24,755	+36,562	+41.46
1981	1,66,767	+42,012	+33.68

1991	2,16,096	+49,329	+29.58
2001	2,94,577	+78481	+36.32
2011	3,74,292	+87,485	+30.50

Sources: Computed and compiled from,

- (i) Census of India (2001), *District Census Handbook, Rohtak District*, Statement-1: Status and Growth History.
- (ii) Census of India (2011), *District Census Handbook, Rohtak District*, Statement-1: Status and Growth History.

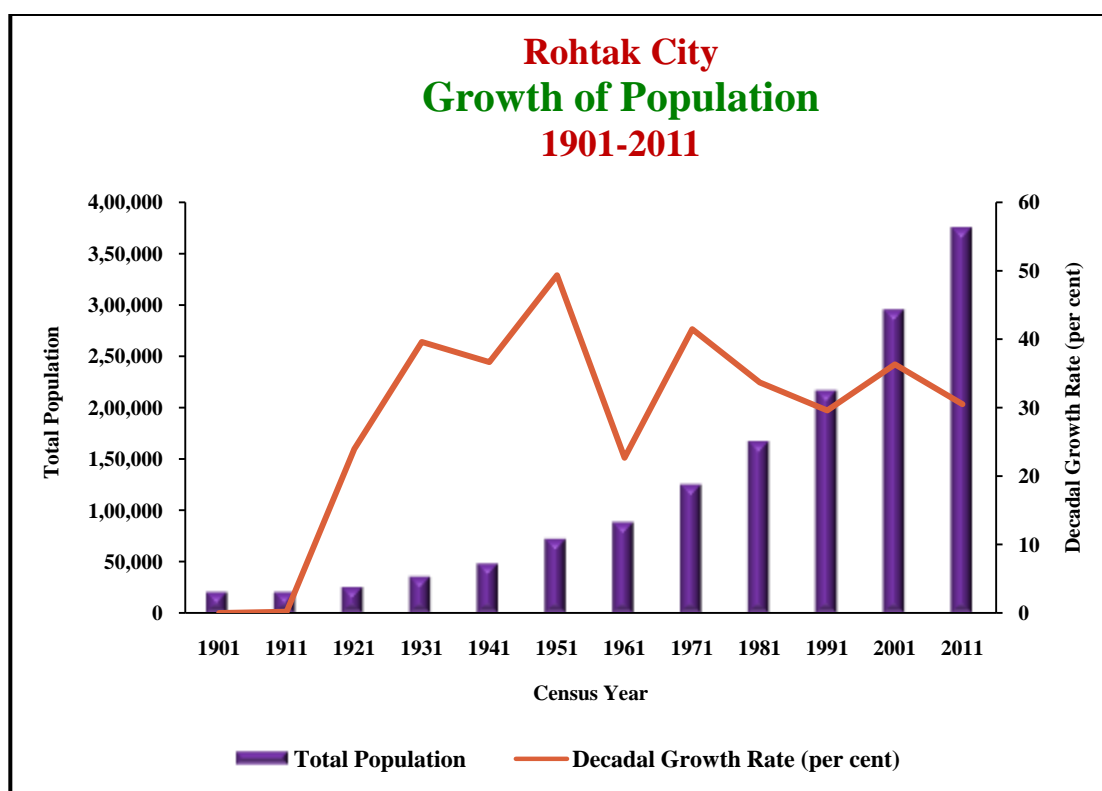


Fig. 1

The total population of Rohtak grew from 20,323 in 1901 to 3,74,292 persons in 2011 registering an increase of more than 18 times during this span of 110 years (1901-2011). It means the city's population has increased by 1841.72 per cent during this period. Prior to 1921, Rohtak city was in the first stage of demographic transition. But from 1921 onwards, it has

entered into the second stage of demographic transition in which the high growth potential of the population is being realized as a high actual growth of population (Sangwan, 2000).

The fast growth of population in Rohtak is the result of two fundamental factors, viz. (i) natural increase, and (ii) in-migration. The latter was induced by wide spread epidemics like plague, small pox, malaria, etc. in the surrounding rural region and the economic opportunities provided in the city. But the high rate of actual increase over the natural increase signifies that Rohtak as a district headquarters, like other district headquarters of India, has been experiencing large-scale net in-migration associated with its expanding functions. However, one more factor, i.e. merger of surrounding villages within expanding municipal limit, can be added in the list of factors responsible for the rapid growth of population in Rohtak city.

Decadal Variations in Population Growth, 1901-2011

Over the years, the wide decadal variations with certain ups and downs in population growth rate of the city have been observed (Table 1 and Fig. 1). The lowest decadal growth rate (0.19 per cent) has been experienced during the decade of 1901-1911 which was the product of untimely deaths of people due to the prevalence of epidemics like plague in 1907 and malaria in 1908.

However, during 1911-1921, the decadal growth rate increased to 23.96 per cent, despite the fact that the growth of population was held in check by the prevalence of high death rate because of large-scale abnormal deaths due to epidemics like plague (1915), malaria (1917), small pox (1912) and influenza (1918) in Haryana (Sangwan and Sangwan, 2003). In addition, poor health and medical services, illiteracy of people at large and inefficient distribution system of food and other basic necessities were largely responsible for a high birth and death rates in this period.

During the decades 1921-1951, annual population growth rate increased by two times and the population increased from about 25 thousand in 1921 to more than 71 thousand in 1951. The net gain of 46.7 thousand people was about 14 times than that of 1901-21. The fall in the death rate after 1921 is generally accepted as the plausible reason for this increase. An overall

improvement in health and sanitation conditions throughout the country brought down the mortality rate. In the wake of partition of India in 1947, due to influx of large number of displaced persons in the cities of Haryana, the decade 1941-51 is characterized by having the highest growth rate (49.34 per cent) of the city.

After the Independence in 1947, the decade 1951-61 is characterized by the lowest growth rate (22.66 per cent) of population when an addition of about 16 thousand people was made in the total population of the city as against the additional increase of 23 thousand during 1941-51. However, the population of the city went up to 1.25 lakh (in 1971) from 88.2 thousand (in 1961) recording an increase of 41.46 per cent in a short span of ten years. So, the decade 1961-71 is attributed with the second highest growth rate of the city. This unprecedented growth rate was due to the accelerated developmental activities and further improvement in health care facilities after the formation of Haryana as separate state in 1966.

During the decades 1971-1991, the growth rate decreased to the level of 29.58 per cent, registering a decline of 11.88 per cent from 41.16 per cent in 1971 to 29.58 per cent in 1991. During this period, the living conditions of the people improved enormously resulting into faster decline in death rates than the birth rates. During the decade 1991-2001, an increase of 6.74 per cent has been noticed in the growth rate which went upto 36.32 per cent in 2001. A downward trend of crude birth rate is held responsible for such a population growth. This was, in turn, affected by an increase in the mean age at marriage, improved quality of life particularly education of females in the state as well as in Rohtak city.

During the first decade of 21st century, i.e. 2001-2011, the growth rate of city's population though remained high, has started slowing down gradually which decreased from 36.32 per cent in 2001 to 30.50 per cent in 2011. This declining trend is a positive indicator of the official efforts of birth control and people's own inclination to opt for smaller families.

Spatial Patterns of Population Growth

Population growth needs to be viewed not only in the context of increase in numbers, but also within the broader perspective of patterns in different wards of the city. An analysis of the population growth patterns at the ward level in the city will help as a first step towards

understanding the direction in which the population and population-related studies should develop. The influence of contextual factors and the patterns of population growth, therefore, are to be evaluated at the ward-level to ascertain the nature of correlations (Sangwan and Sangwan, 2003).

Rohtak, with a population of 3,74,292 persons, is the third largest city of Haryana after Faridabad (14,14,050 persons) and Gurgaon (8,86,519 persons), as per 2011 census. The spatial distribution of population in Rohtak reveals the following physically separated areas of concentration; (i) the walled city (ii) the Camp Area which was established with the objective of temporarily setting the displaced persons who had migrated from West Pakistan after the Partition of the country in 1947; and (iii) the main area of commercial concentration located between Railway Road and Rohtak-Jhajjar Road and to the south of the Walled City. It shows that the concentration of population is heavy in the CBD and thins out to the peripheries from the core. To some extent, the newer tendency of decentralisation has also been observed, as the city-heart is expanding towards the residential areas and trade, commerce and offices are compelling the citizens to reside in the outer areas. Sectors 1, 2, 3, 4, 5,6, 14, 27, Omax City, Sun City (consisting of sectors 34, 35 and 36), Dev Colony, Kamal Colony, Tilak Nagar, Bharat Colony and Vikas Nagar are such developments.

Spatially speaking, the wide variations in the rate of population growth have been experienced at the ward-level ((Table 2 and Map 1). The highest growth rate has been recorded in Ward No. 9 (178.50 per cent) and the lowest in Ward No. 30 (-21.60 per cent). The wards that recorded the growth rate higher than the city's average (30.50 per cent) are as many as 12 out of the total of 31 wards in the city. Out of these 12 wards, those wards deserve special mention in which growth rate is above 100 per cent, viz. Ward No. 9 (178.50 per cent), Ward No. 20 (112.32 per cent) and Ward No. 11 (104.79 per cent). These are the newly developed planned areas meant for residential purposes, where family migration either from the countryside or from the congested areas of the city took place resulting into such a high growth rate.

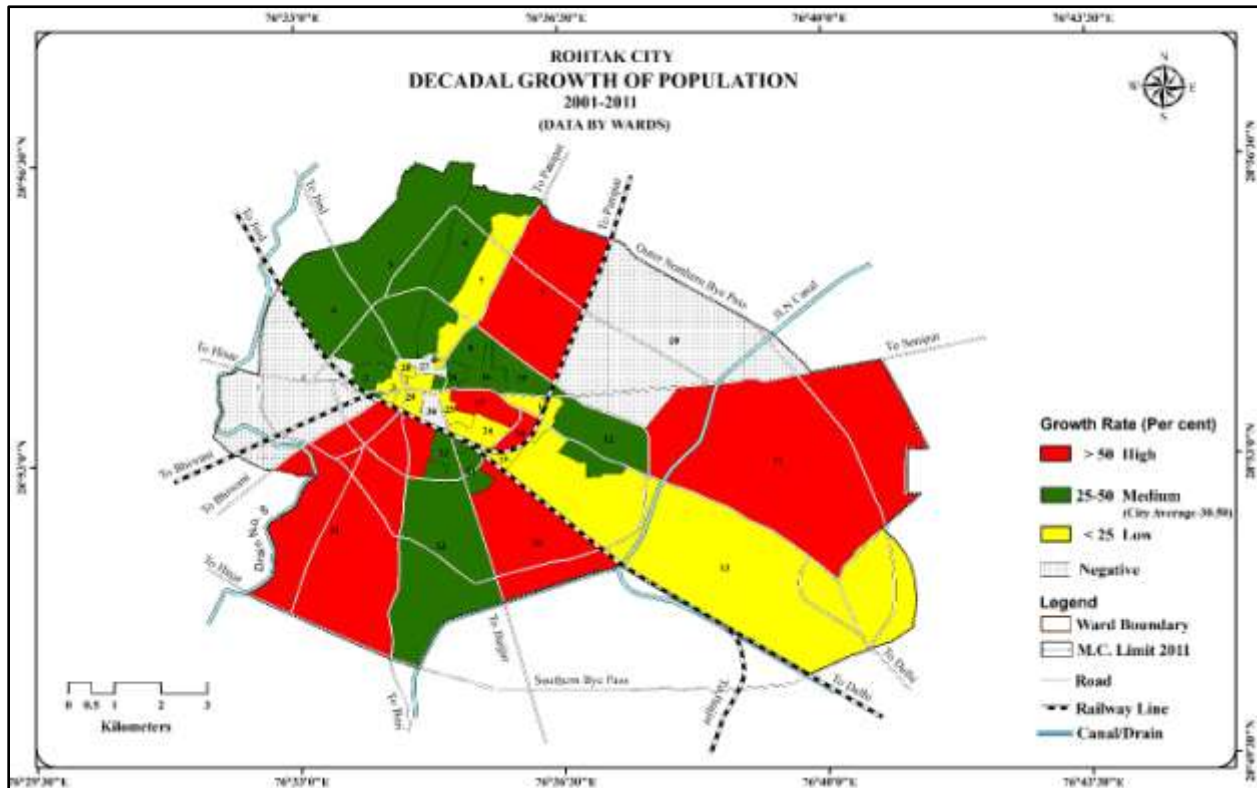
Table 3.1: Rohtak City: Decadal Growth of Population by Wards (2001-2011).

(Arranged in Descending Order of Per cent Decadal Growth)

Rank	City /Ward No.	Population		Decadal Growth	
		2001	2011	Absolute 2001-2011	Per cent 2001-2011
	City	286,807	374,292	87,485	30.50
1 st	9	9,703	27023	17,320	178.50
2 nd	20	6,972	14803	7,831	112.32
3 rd	11	7,558	15478	7,920	104.79
4 th	18	5,648	9729	4,081	72.26
5 th	17	6,011	10034	4,023	66.93
6 th	31	12,048	19066	7,018	58.25
7 th	4	9,624	14094	4,470	46.45
8 th	15	7,539	10997	3,458	45.87
9 th	2	7,689	11186	3,497	45.48
10 th	16	6,291	8794	2,503	39.79
11 th	12	9,139	12343	3,204	35.06
12 th	22	16,317	21476	5,159	31.62
13 th	21	8,046	10452	2,406	29.90
14 th	8	7,729	10002	2,273	29.41
15 th	6	10,098	13022	2,924	28.96
16 th	5	10,176	13117	2,941	28.90
17 th	26	7,882	10158	2,276	28.88
18 th	23	7,894	9968	2,074	26.27
19 th	13	8,188	10201	2,013	24.58
20 th	29	6,940	8271	1,331	19.18
21 st	14	8,473	9922	1,449	17.10
22 nd	3	7,538	8506	968	12.84
23 rd	19	9,293	10457	1,164	12.53
24 th	24	8,512	9578	1,066	12.52
25 th	25	7,446	7984	538	7.23
26 th	28	7,962	8113	151	1.90
27 th	7	10,086	10222	136	1.35
28 th	1	17,053	16690	-363	-2.13
29 th	10	14,605	12255	-2,350	-16.09
30 th	27	11,035	9234	-1,801	-16.32
31 st	30	13,312	10437	-2,875	-21.60

Sources: Computed and compiled from,

- i) Census of India (2011), *Primary Census Abstract (PCA) Data Tables*, Haryana, Office of the Registrar General & Census Commissioner, India, New Delhi.
- ii) Census of India (2001), *Primary Census Abstract (PCA) Data Tables*, Haryana, Office of the Registrar General & Census Commissioner, India, New Delhi.



Map 3.1

By comparison, the growth rate lower than the city's average (30.50 per cent) has been recorded in 19 wards. Out of these 19 wards, four wards are characterized by negative growth rate, viz. Ward No. 1 (-2.13 per cent) and Ward No. 10 (-16.09 per cent) are located in outer areas in the west and the east respectively; whereas Ward No. 27 (-16.32 per cent) and Ward No. 30 (-21.60 per cent) are located in the inner parts of the city. Intra-city out-migration towards planned residential developments, male dominated rural-urban migration of labour class, establishment of spacious economic activities or civic amenities, for example, annaj mandi,

water works, undeveloped land, increasing awareness about small sized families, etc. are the plausible reasons for negative growth of population.

Concluding Remarks

Rohtak is the third largest city of Haryana state. Though the growth of population in the city varies from decade to decade, but the population figures for the city as a whole show continuous increase since 1901 to 2011. The growth rate of population varies from decade to decade, but the population figures for the city as a whole show continuous increase since 1901 to 2011. The total population of Rohtak grew from 20,323 in 1901 to 3,74, 292 persons in 2011 registering an increase of more than 18 times during this span of 110 years (1901-2011). It means the city's population has increased by 1841.72 per cent during this period.

The city's lowest decadal growth rate (0.19 per cent) has been experienced during the decade of 1901-1911 which was the product of untimely deaths of people due to the prevalence of epidemics like plague in 1907 and malaria in 1908. By contrast, the decade 1941-51 is characterized by having the highest growth rate (49.34 per cent) of the city. This was mainly because of the influx of large number of displaced persons in the cities of Haryana in the wake of partition of India in 1947, and decrease in mortality rate due to overall improvement in health and sanitation conditions throughout the country.

The declining trend of growth rate (from 36.32 per cent in 2001 to 30.50 per cent in 2011) recorded in the first decade of 21st century, is a positive indicator of the official efforts of birth control and people's own inclination to opt for smaller families.

Spatially speaking, the wide variations in the rate of population growth have been experienced at the ward-level. The highest growth rate has been recorded in Ward No. 9 (178.50 per cent) and the lowest in Ward No. 30 (-21.60 per cent). Out of the total of 31 wards in the city, 12 wards recorded the growth rate higher than the city's average (30.50 per cent) and among these, Ward No. 9 (178.50 per cent) is having the highest growth rate. At the other end of the scale, the growth rate lower than the city's average (30.50 per cent) has been recorded in 19 wards. Out of these, four wards are characterized by negative growth rate, but Ward No. 30, located in the inner part of the city is characterized by highest negative growth rate (-21.60 per cent).

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