

## **A DEMOGRAPHIC STUDY OF HARYANA OVER APPROACHING DECADE (2015-2025)**

**ABHISHEK SHEORAN & CHETAN**

Department of Statistics, M.D. University, Rohtak, Haryana

### **ABSTRACT**

In the present paper, we project future population of Haryana state till 2025, taking 2011 as a base year. Since the population projection deals with future, which is unpredictable, a number of assumptions have been made so that future trends are well appropriated. These include no territorial change in the existing boundaries of Haryana and continuation of the prevailing trends of its fertility, mortality and emigration. Estimate of demography for the future period is essential tool for the development and planning since human resources and needs vary according to the size of population. Non availability of all requisite data restricted the choice of adopting the techniques to ratio, growth differential, compound annual growth etc. These calls for prior planning achieve optimal resources, population ratios in terms of infrastructure development, housing health, educational planning facilities and other different measure facilities.

**KEYWORDS:** Demographic Data, Compound Annual Growth Rate, Growth Differential, Extrapolation

### **1. INTRODUCTION**

Haryana, ancient name Haritanaka is a state in India. It came into existence on November 1, 1966 as newly created state carved out of the Punjab state on the basis of language. It has been a part of Kuru region in north India. The name Haryana is found mentioned in the 12<sup>th</sup> century as by Apabhramsha written by Vibudh Shridha. It is bordered by Punjab and Himachal Pradesh to the north and by Rajasthan to the west and south. The river Yamuna defines its eastern border with Uttarakhand and Uttar Pradesh. Hindus are in majority in Haryana about 88.23% of the population, Muslims 5.78%, Sikhs 5.53% and others 0.45%. In 2001 Hindus made up 18655925 of the population, Muslims 1222196, Sikhs 117062.

But these days the state seems a massive influx of immigrants from across the nation, primarily from Bihar, West Bengal, Uttarakhand, Rajasthan and Uttar Pradesh. As we know that India is the developing country so Haryana... but the population growth is not good for developing countries. Therefore we need to study the population scenario using techniques of population projection.

Population projection is scientific attempt to peep into the future population scenario, under certain assumptions by available using data of that point of time. The assumptions made with their probability of coming out to be right, forms a critical input in this mathematically efforts. Predicating the future course of human fertility and mortality is not an easy task, especially when looking beyond in time is bound to be influenced by medical and health intervention strategies, food production and its equitable availability, climatic variability, socio-cultural setting, political economic conditions and a host of other factors affecting the population dynamics. This makes it really difficult exercises therefore caution must be considered while making or using the population in the context of various conditions imposed.

The need for population projection in India at various levels and by different components like age, sex, rural-urban etc. for use by the official agencies across the board, both at the centre and the states, was keenly felt in 1958 on the eve of the formulation of the third five year plan. From time to time, the official level projection of the country's population also became necessary for planning purpose. Being the second most populous country in the world, the size and growth of India's population have remained a matter of great interest not only to India but to the overseas also. Different population projections at the country level are made by the government (National and agencies from time to time). In addition, individual demographers make their own projections for the country as a whole and sometimes at the sub-national level also. The international agencies which make projections for the world and for the individual countries are the United Nations population divisions, the World Bank, the United Nation Population Funds (UNFPA) etc.

Beginning from 1958, it has been customary from the office of registrar general and census commissioner, India to undertake the exercise of population projection on the behalf of the planning commission of India. The first committee on population projection were setup by planning commission in 1958 under the chairmanship of the registrar general of India provide a set of population for India and states for use in the preparation of the third five year plan. Thereafter, this committee was revised from time to time to revise the existing official projection figures on the basis of latest available census data. Here the census data is used to project the population of Haryana obtains from the Registrar General of India

## **2. ASSUMPTIONS**

Population projections are based on a certain set of assumptions. These in turn follow from an understanding of the short-term and long-term historical trends, government policies and other relevant information influencing the population change in any area. The foremost assumption in these cases is that there will be no change in the state of Haryana, till 2025, the year up to which the population projections are made. Secondly, it is visualized that prevailing trends in the fertility, mortality will remain the same not only in the Haryana, but also in the regions nearby Haryana. Finally, non-demographic factors such as natural catastrophes would not come into play. One may say that the present set of projections would be more explorative than prescriptive.

In order to neutralize the debilitating impact of assumptions on the projected population figures and make these more dependable, it is proposed that more than one technique be put into service and the result be compared. In the present exercise to population projection closed to each were averaged to work out more reliable projection figures.

## **3. TECHNIQUES**

A variety of techniques, both mechanical as well as analytical, are used to project future population depending upon the availability of data. Mechanical techniques deal with aggregate population while analytical once differentiate between the relative contributions of the two vital processes i.e. fertility and mortality in population growth. The population of Haryana has been projected through a combination of mechanical techniques. Guided by the dependability of techniques and availability of data, two techniques namely ratio and growth differential have been used for projecting the population of Haryana. Each technique is critically examined in terms of its assumption, data requirements, properties and limitations. The projecting the population by using any of the two techniques, all the steps followed and the calculations done have been presented with a view to making it available for any other scholar.

### 3.1 Ratio Method

The method assumes that share of Haryana population in that of Rajasthan and U.P. will remain virtually the same in the short run and any change in the degree and the direction of this share will sustained over a long period. The current growth behavior of a part is seen as linked to that of the whole. Krishan (1977) made the population projection using the same method for Chandigarh.

Two sets of data are required for the purpose. The first requirement is the total population of Haryana and that of Rajasthan and U.P. or a number of previous and the other is future population size of Rajasthan and U.P. for the year for which Haryana population projection are to be made. The data to meet the first requirement were collected from the census of India reports for a number of years and for the second requirement, the data was collected from the Report of the Technical Group of population projection constituted by National Commission on population, May 2006 by the Office of Registrar General and Census Commissioner, India. Steps involved in this method are given by

**Step 1:** The combined share of Rajasthan and U. P. Population in the population of Haryana in percent for 1971, 1981, 1991, 2001 and 2011 is calculated.

**Step 2:** The difference between the combined share of Rajasthan and U.P. to the total population of Haryana in 2001 and 2011 for projecting the population of 2021 is to be calculated.

Share of Rajasthan and U.P. population in the population of Haryana in 2001 ( $S_{2001}$ ) = 10.817

Share of Rajasthan and U.P. population in the population of Haryana in 2011 ( $S_{2011}$ ) = 10.826

Therefore  $D = S_{2001} - S_{2011}$

= 10.817 - 10.826

= -0.009

The tendency in degree and direction is to be carried forward for projecting the population for 2021. The extent of decrease is to be calculated as follows

$S_{2021} = S_{2011} - D$

= 10.826 - (-0.009)

= 10.835

**Step 3:** The Rajasthan and U.P. combined share of 10.835 percent in the population of Haryana projected for 2021 to be worked out in the following manner.

Combined population of Rajasthan and U.P. projected for 2021 ( $T_{2021}$ ) = 271738

$HAR_{2021} = T_{2021} * S_{2011}/100$

= 271738 \* 10.835 / 100 = 29442

**Step 4:** The same style was carried forward for the year 2031.

The population for inverting years was interpolated up to 2025 on a yearly basis. The results of the estimated population by using this method on yearly basis up to 2025 are given in following table.

**Table1: Projected Population of Haryana by Ratio Method: 2011-2025**

| Years | Population<br>(x 1000) | Years | Population<br>(x 1000) |
|-------|------------------------|-------|------------------------|
| 2011  | 25439                  | 2019  | 28631                  |
| 2012  | 25854                  | 2020  | 29002                  |
| 2013  | 26266                  | 2021  | 29362                  |
| 2014  | 26675                  | 2022  | 29720                  |
| 2015  | 27079                  | 2023  | 30071                  |
| 2016  | 27477                  | 2024  | 30416                  |
| 2017  | 27868                  | 2025  | 30755                  |
| 2018  | 28253                  |       |                        |

### 3.2 Growth Differential Method

The Urban-Rural Growth Differential (URGD) technique was developed by the United Nations Population Division to project and estimate urban population. The technique used here is a variant of URGD technique, which enjoys a high degree of respectability for projecting the populations of a sub-system. The method assumes that growth behavior of the sub-system and that of whole of which it forms a part are complementary to each other “If the former records a faster growth rate, this is constructed at happening at the cost of the rest of the system, which is soon as losing in marking a slower rate of growth. In essence, the method takes into account the difference in growth rate of the sun-national area/state and rest of the system and projects population for formers (Krishan 1994). The growth differential technique calls for population figures for Haryana for two census periods and the projected population of Rajasthan and U.P, for the years for which projections are to be made. The projections for Rajasthan and U.P as a whole given at five years interval was obtained from the report of the Technical Group of Population Projections constituted by the National Commission on Population by the office of the Registrar General and Census Commissioner, India. The steps involved in this method is as follows

**Step 1:** Haryana’s 2010 Population ( $HHD_{2010}$ ) = 25020000

Haryana’s 2005 Population ( $HHD_{2005}$ ) = 22883000

Rajasthan + U.P.’s 2010 Population ( $RUP_{2010}$ ) = 66750000 + 197271000

= 264021000

Rajasthan + U.P.’s 2005 Population ( $RUP_{2005}$ ) = 61136000 + 179824000

= 240960000

Rajasthan + U.P.’s 2015 Population ( $RUP_{2015}$ ) = 71973000 + 214671000

= 286644000

**Step 2:** Haryana’s compound annual growth (HAGR) during 2005-2015 in unit fraction has been calculated

$$\begin{aligned}
 \text{HAGR} &= \left[ \frac{HHS_{2010}}{HHS_{2005}} \right]^{\frac{1}{5}} - 1 \\
 &= \left[ \frac{25020}{22883} \right]^{\frac{1}{5}} - 1 = 1.0180 - 1
 \end{aligned}$$

$$= 0.0180$$

**Step 3:** The HAGR of non-HHD has been worked out as follows

$$\text{HAGR (Non-HHD)} = \left[ \frac{(RUP_{2010} - HHD_{2010})}{(RUP_{2005} - HHD_{2005})} \right]^{\frac{1}{5}} - 1$$

$$= 2.8768 - 1$$

$$= 1.8768$$

**Step 4:** The difference between the two growth rates (D) i.e. HHD growth rate minus

Non-HHD growth rate has been calculated

$$D = 0.0180 - 0.0160$$

$$= 0.0020$$

**Step 5:** Haryana's 2015 Population has been calculated by solving following two equations A and B

$$A = \frac{HHD_{2010}}{NON-HHD_{2010}} e^{5D}$$

And

$$B = \frac{A}{1+A}$$

Therefore we get the following results

$$\text{HHD}_{2015} \text{ projected population} = B \times RUP_{2015}$$

$$= 26579000$$

**Step 6:** The same procedure for projecting the population for the successive years of 2020 and 2025 has been adopted.

**Step 7:** In between population figures were obtained through interpolations using the URGS method the projected population of Haryana till 2025 on yearly basis has been given in following table.

**Table 2: Projected Population of Haryana by Growth Differential Method: 2011-2025**

| Year | Population (x 1000) | Year | Population (x 1000) |
|------|---------------------|------|---------------------|
| 2011 | 25092               | 2019 | 28866               |
| 2012 | 26179               | 2020 | 29171               |
| 2013 | 26613               | 2021 | 29497               |
| 2014 | 26875               | 2022 | 29815               |
| 2015 | 27256               | 2023 | 30170               |
| 2016 | 27604               | 2024 | 30703               |
| 2017 | 28085               | 2025 | 30972               |
| 2018 | 28529               |      |                     |

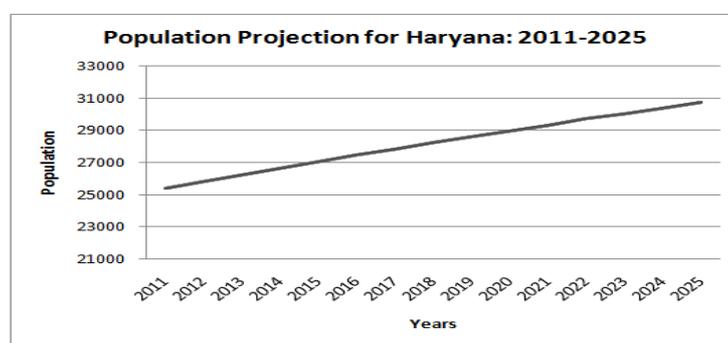
#### 4. PROJECTED POPULATION

The population figures as projected by the two methods techniques are quite close to each other. These were

deemed as averaging to arrive at dependable projection figures. A marked deviation between the projected populations by the Technical Group of Population Projections constituted by the National Commission on population by the office of Registrar General and Census Commissioner, India.

**Table 3: Projected Population of Haryana by Averaging the Results of Two Methods**

| Years | Population('000) | Years | Population('000) |
|-------|------------------|-------|------------------|
| 2011  | 25266            | 2019  | 28749            |
| 2012  | 26017            | 2020  | 29087            |
| 2013  | 26440            | 2021  | 29430            |
| 2014  | 26775            | 2022  | 29768            |
| 2015  | 27168            | 2023  | 30121            |
| 2016  | 27541            | 2024  | 30560            |
| 2017  | 27977            | 2025  | 30864            |
| 2018  | 28391            |       |                  |



**Figure 1**

## 5. CONCLUDING REMARKS

The population of Haryana is projected as 3.08 million in 2025 compared to 2.70 million in 2015 as addition of one-fifth of the existing base of population. In the next 10-12 years around half million persons will be added in the population of Haryana. This increase in the population will have a bearing on its physical infrastructure especially on housing, health and education. In this case the household size declines the demand for housing will be much greater. The successive future plans and policies of the Haryana need to take into account the size of population projected for successive years till 2025.

## REFERENCES

1. Census of India 2011: Provisional Population Total, Paper 1 of 2011, Haryana Series, Directorate of Census Operations, Haryana.
2. Census of India 2011: Provisional Population Total-India, Population Projections, 2011, census of India.
3. Krishan, G. (1997) Chandigarh 2020: Projections of Population and Class Structure. Delhi: Swan Publications.
4. National Commission on Population, 2006: Report of the Technical Group on Population Projections for India and States, 2001-2006, New Delhi.
5. Sharma, P.K. 2011: Futuristic Geography, The Chandigarh Periphery Zone: 2020. New Delhi: Deep & Deep Publications Pvt. Ltd.