**10**

# POPULATION DYNAMICS AND ECONOMIC GROWTH IN MAHARASHTRA STATE

**Rashmi[1]** and **Narayani Gogoi[2]**
[1]Assistant Professor (ad-hoc), Department of Geography,
Shyama Prasad Mukherji College for Women, Delhi University, Delhi, India
[2]Ph.D. Research Scholar, Centre for the Environment,
Indian Institute of Technology Guwahati, India
Email: rashmithakur1990@gmail.com, narayani92gogoi@gmail.com

**Abstract:** *Demographic trends have a substantial impact on any country's economic performance. The present study demonstrates and analyzes the probable relationship between population indicators and economic growth of Maharashtra. For population dynamics and economic growth assessment, we have selected these indicators such as – per capita income, total population, urban population, literacy rate, birth rate, death rate and sex ratio of 1961, 1971, 1981, 1991, 2001 and 2011. To understand the Bivariate association between population indicators and economic growth and which variable will more affect economic growth, various statistical techniques has been used like- Karl Pearson Product Movement Correlation method and Stepwise Multivariate Regression has been used. The result shows that there is a positive high correlation between per capita income and total population (R = 0.858) that means when population increase that translate into increase of participation in the workforce. And there is also high positive correlation between per capita income and urban population (R = 0.883). Considering all the causal factors in the stepwise regression, it indicates that the highest correlation coefficient ($R^2$ =0.779) which collectively explains the 77.90 per cent change through urban population in economic growth.*

**Key words:** Population Growth, Urban, Per Capita Income, Dynamics

## Introduction

Population is defined as a group of members of a single species who live together in the same habitat and are likely to interbreed. Each population has an exclusive physical distribution in space and time. It may contain individuals of different ages and its size is likely to change over time, growing or shrinking according to the reproductive success of its members. The link between economic development and population growth is a very old issue in social science, and this linkage has its original association with the name of Robert Malthus. His well-known essay on population of 1798 contended that population growth unavoidably leads to poverty – fundamentally, he contended that population growth would always exceed the means of survival. Population growth happens which leads to surplus supply of labour creating pressure on wages, to the point where it reaches subsistence level. Beyond that point population growth usually only comes down due to external stimuli like an event of war, starvation or disease, but even in such case the people that are left behind would remain poor. Malthus, however modified his views considerably in the later editions, though his name is still mainly associated with the thesis of his original Essay (Dennis Ahlburg and Robert Cassen, Population and Development).

Demographic trends have a significant impact on a country's economic performance. For example, the declining fertility rates in the industrialized nations have led to labour shortages and put a strain on pension systems. On the other hand, rapid population growth in the developing nations has often been looked as a potential impediment to their socioeconomic development. This encouraged some countries such as China and Singapore to introduce policies aimed at decreasing their population growth. Even the global demographic trend has become a subject of discussion by researchers, policymakers, and the mass media. Economic performance in any country is, to a large extent, affected by the country's demographic situation. There is continued disagreement of opinions regarding the influence of population growth on economic development. The debate between negative impact and positive impact of population growth on the economy is thus still ongoing.

## Population as a Positive Impact

The proponent of this ideology argued that in the form of human capital (equipped with variety of skills) population is a great asset, and an appropriate investment in it may bring high returns. Contextually, Swamy (1971), an economist observes, wherever there is possibility of increase in production through a demand-pull effect due to increase in size of labour force, the large population is rather a requirement, advancing another logic the politician-cum-ideologue Mao-Tse-Tung describes population as blessing under the shadow of nuclear war apart from its being a greatest wealth and a stimulant to innovation and development. Thus, to him, a country, with small population will be in disadvantageous position. In view of Sahai (1993), financial capital will have to chase human capital and not the other way round. That makes skilled workforce a more reliable asset than financial capital. In fact, the skills, the training and knowledge commanded by workers are more relevant to economic future.

## Population as a Negative Impact

In this context one can underline the views particularly of the rich and powerful nations, political leaders and their lackeys, policy-makers and above all, also a group of intellectuals who unwillingly hold the large size of population and more so it's fast growth as rather the sole culprit for resource depletion, ecological degradation and variety of other problems. Also, such problems have been brought into sharper focus by some international organizations, e.g., World Development Report (1990) which identifies the population growth as a factor responsible for reinforcing poverty in a number of ways. It is further stated that fast population growth, characteristic of poor nations, poor economies, and particularly the poor people therein does not allow any incremental gains (World Development Report, 1990). Over population in

most developing countries is one of the main consequences of, and simultaneously a fundamental prerequisite for their economic underdevelopment.

According to Friedberg and Hunt (1995) population growth and urbanization depart together, and economic development is closely correlated with urbanization. Rich countries are urban countries. Population growth coupled with constrained resources leads to an increase in population density and, together with rural-urban migration this causes higher urban agglomeration. And to achieve a balance here is critical for achieving sustained growth because large urban centres allow for innovation and increase economies of scale. As a result of this companies have a larger workforce at their disposal which allows them to produce goods in larger numbers and at a cheaper rate usually driven by economies of scale, serving a larger number of low-income customers. Many countries have companies that benefit from increasing population growth and density as it allows them access to a larger talent pool of available workforce typically from lower and lower-middle income families. Ability to employ a large workforce at relatively lower levels of average income makes their business model viable because they can serve a multi-million customer base which allows them to easily utilize the large talent pool. Thirlwal (1973**)** investigated the relationship between population growth and economic development with special reference to developing economies. The study found out that the relationship between economic development and population growth is a complex one, particularly concerning the cause-and-effect dynamics between the two factors. Rapid population growth usually leads to lower per capita income growth in least developed countries (LDCs) as the growth in working population is typically slower than the growth in overall population, yet there are many ways in which population growth may be an incentive for progress, and there are many logical reasons due to which families in developing countries might choose to have many children. The study concluded that intricacy of the subject is intensified by the fact that, economic development is a multidimensional concept. The rate of economic development depends on the diversion of resources from consumption to uses that raise future output. A population with a higher percentage of dependents on producers consumes more of a given output and devotes less to investments. Thus, high fertility, which produces a high level of dependency, promotes consumption at the expense of investment.

In last few years, dependable time-series data sets that are comprehensive enough to allow conducting of time-series regression analyses have been assembled. The enhanced accessibility of reliable data sets has provided impetus to the research on the relationship between economic development and population growth. Tiffin and Dawson (1998), for example, utilized time-series data to analyse the long-term relationship between economic development and population growth in India. They used the augmented Dickey-Fuller (ADF) unit root test and the Johansen (1988, 1991) co-integration test to analyse the co-integrating relationships between the two variables. However, the study was unable to detect a long-term equilibrium relationship between economic development and population growth in India. As the researchers concluded, "…Population growth neither causes per capita income growth nor is caused by it" (Dawson and Tiffin 1998).

**Methodological Framework**
This paper deals with the identification of population dynamics and economic growth relationship through various indicators from 1961 to 2011 time period using appropriate statistical techniques. In order to analyse the probable relationship between fertility and economic growth of Maharashtra, the data like –Per capita income (in Rs) is taken from Economic Survey of Maharashtra of 1961, 1971, 1981, 1991, 2001 and 2011. For population dynamics assessment four main indicators has been selected like- total population, urban population, literacy rate, birth rate, death rate and sex ratio of 1961, 1971, 1981, 1991, 2001 and 2011 and the data has been taken Census of Maharashtra, 1961-2011. To understand the

bivariate association between population indicators and economic growth Karl Pearson's Product Moment Correlation Technique has been used.

**Research Area**

Maharashtra is a state in the western region of India and is India's second-most populous state and third-largest state by area. It is spread over 307,710 km² area and is bordered by the Arabian Sea on the west and the Indian states of Telangana, Karnataka, Gujarat, Goa, Chhattisgarh, Madhya Pradesh and the Union territory of Dadra and Nagar Haveli. The main rivers running across the state are Krishna, and Godavari. Maharashtra is one of the largest, wealthiest and developed states in India. Maharashtra's Gross State Domestic Product for 2014 is estimated at $295 Billion in current prices which rose to $398 Billion in 2015. Based on 2021 data, Maharashtra's per capita income is $3000, far ahead of national average of $1,947. Maharashtra is third-most urbanised state with urban population of 45 per cent of whole population.

Mumbai, the capital of Maharashtra and also the financial capital of the country houses the headquarters of almost all financial institutions, major banks, insurance companies and mutual funds. India's largest stock exchange Bombay Stock Exchange, oldest in Asia, is also located in the city. After the success in the information technology in the neighbouring states, Maharashtra has set up software parks in Pune, Mumbai, Navi Mumbai, Nagpur and Nasik, Aurangabad and Latur. Maharashtra with annual exports of ₹18 000 crores is the second largest exporter of software and accounts in excess of 30 per cent of the country's software exports, with over 1,200 software units based in the state. Maharashtra rank first in coal-based thermal electricity as well as nuclear electricity generation with national market shares of over 13 per cent and 17 per cent respectively.

**Figure 01: Location Map of the Study Area**
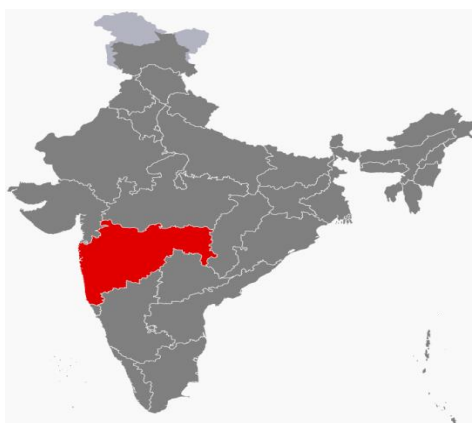


**Results and Discussion**

The following table unveils the probable relationship of per capita income (dependent variable) with causal factors (independent variables) of dynamics, regression was carried out. In this study the selected independent variables are total population, urban population, literacy rate, birth rate, death rate and sex ratio. From the table we can found that there is a positive high correlation between per capita income and total population (R = 0.858) that means when population increase that translate into increase of participation in the workforce. Again, there is high positive correlation between per capita income and urban population (R = 0.883) that means that when number of urban populations increases, per capita income also increases. There is a positive high correlation between per capita income and birth rate (R = 0.874) and per capita income and death rate (R= 0.730).

To estimate the collective effects of causal factors, stepwise multivariate regression analysis was also carried out (Table 1). In the stepwise multivariate regression, it is assumed that the relationships between variables are linear. Considering all the causal factors in the stepwise regression, it indicates that the highest correlation coefficient ($R^2$ =0.779) which collectively explains the 77.90 per cent change through urban population in economic growth. The birth rate explains the second highest proportion (76.30 per cent) as it remodels the economic growth. The lowest correlation coefficient is of sex ratio ($R^2$=0.212) which will bring only 21.20 per cent change in economic growth.

**Table 01: Model Summary of Stepwise Regression**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-----|----------|-------------------|----------------------------|
| 1 | .858[a] | .736 | .670 | 18906.584 |
| 2 | .883[b] | .779 | .724 | 17281.462 |
| 3 | .784[c] | .615 | .518 | 22835.678 |
| 4 | .874[d] | .763 | .704 | 17903.455 |
| 5 | .460[e] | .212 | .015 | 32658.939 |
| 6 | .730[f] | .533 | .416 | 25144.486 |

a. Predictors: (Constant), Tot_Pop    b. Predictors: (Constant), Urb_Pop    c. Predictors: (Constant), Lit_Rt
d. Predictors: (Constant), Br_Rt    e. Predictors: (Constant), S_R    f. Predictors: (Constant), D_Rt

## Conclusion

The link between population growth and economic development is among the older issues in social science, particularly because of its association with the name of Robert Malthus. Demographic trends have a substantial impact on any country's economic performance. For example, the declining fertility rates in the industrialized nations have led to labour shortages and put a strain on pension systems. On the other hand, the rapidly expanding population in the developing nations has been viewed as a potential impediment to their socioeconomic development. The debate between positive impact and negative impact of population growth on the economy is thus still ongoing. The present study demonstrates and analyses the probable relationship between population indicators and economic growth of Maharashtra. The result shows that there is a positive high correlation between per capita income and total population (R = 0.858) that means when population increase that translate into increase of participation in the workforce. And there is also high positive correlation between per capita income and urban population (R = 0.883). Considering all the causal factors in the stepwise regression, it indicates that the highest correlation coefficient ($R^2$ =0.779) which collectively explains the 77.90 per cent change through urban population in economic growth.

## References

1. Friedberg, R. and J. Hunt (1995). The Impact of Immigrants on Host Country Wages, Employment and Growth (in Symposia: Immigration). The Journal of Economic Perspectives (2): 23-44.
2. Malthus, T.R. (1798). An Essay on the Principles of Population, (Cambridge: Cambridge University Press.
3. Thirlwal, A. P. (1993). Growth and Development with Special Reference to Developing Economies", University of Kent at Canterbury, 5th Edition. Pp. 143-155.
4. Dawson, D. J. and R. Tiffin. (1998). Is there a long-run relationship between population growth and living standard? The case of India. Journal of Development Studies 34(5):149.
5. Johansen, S. 1988. Statistical Analysis of co-integration vector. Journal of Economic Dynamics and Control 12(2/3):231–254.
6. Estimation and hypothesis testing of co-integrated vectors in Gaussian VAR Models (1991). Econometrica 59(6):1551–1580
7. Tournemaine, F. (2007). Can population promote income per capita growth? A balanced perspective. Economics Bulletin 15(8):1–7.
8. Klasen, S. and D. Lawson. (2007). The impact of population growth on economic growth and poverty reduction in Uganda. Departmental Working Paper No. 133. Department of Economics, University of Goettingen.