

Modeling and Analysis of Population Dynamics in India

K. Vizayakumar

Associate Professor

Department of Industrial Engineering and Management

Indian Institute of Technology

KHARAGPUR 721 302.

vizay@hijli.iitkgp.ernet.in

Fax.: 091 3222 55303. Ph.: 091 3222 77693.

India is a country with vast land and natural resources, the large part of which are still unexplored. More so, its consumption levels are very low, less than one-tenth compared to USA. It makes India more stable and can sustain a large population. However, the current scenario shows that more than 70% of the Indian population are poor and among them, 40% are very poor. This leads to the fact that there exists improper utilization of resources and improper distribution of wealth.

It is also felt that limiting the population may also add to better living, to better conservation of resources, and to better future. In this context, it is necessary to understand the dynamic nature of the population growth in India. Government of India, in every five-year plan, has been setting the goals regarding limiting the population growth rate but could not achieve so far. Trend in the society show that as the economic level of family increases, the family adopts to family planning, i.e., restricting the number of children to not more than two. These families, called in India middle class, do not require any external pressure or campaign in this regard. Another factor that contributes to the adoption of family planning is the education level, particularly in women. Whereas, it is also observed that the people having more affinity toward the religious faiths/social

customs do not adopt to family planning. The family income decides the education level among women as well as the affordability of medical facilities. These, in turn, affect the behaviour of the people towards the family planning.

This paper makes an attempt to capture these interrelationships among several variables that determine the net growth rate of the population. These relationships are modeled and analyzed using system dynamics methodology in order to know the dominant factors that cause the people to adopt to family planning and also to identify appropriate policy measures. The policies such as "increasing the literacy rate among women to 60%", "increasing the women employment to 30%", "increasing the ratio of minimum salary to the maximum salary to 25%" are considered for analysis. The analysis reveals that the increase in income level to a comfortable level (ratio of minimum to maximum as 25%) is the dominant policy that can reduce the growth of the population. If the people are uplifted to this level, expenditure on promotion and propagation of family planning can be greatly reduced.