

# APPLICATION OF SOME SIMPLE MULTIREGIONAL GROWTH AND MIGRATION MODELS TO DISTRICT LEVEL CENSUS DATA IN MAHARASHTRA

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## 1. *Introduction and outline of work*

When the movement or behaviour of the total population over time in a closed region, that is a region between which and the rest of the world there is no movement of population, is being considered the internal movement of the population does not become relevant provided the birth-rates and death-rates are the same in all the sub-regions of the region. In such a case the closed region may be said to be homogeneous with respect to the birth and death-rates. Some models have been built to represent the possible behaviour of the aggregate population in the closed region over time and then to forecast the population for future dates. One of the simplest models that is considered is the exponential model in which the rate of natural growth of the population at time  $t$  is proportional to the population at time  $t$ . Another model which is supposed to be more realistic than the former is the logistic model in which the rate of natural growth diminishes after a stage as population increases and the population tends to a stationary level as time increases indefinitely.

When the closed region is not homogeneous with respect to the birth and death-rates but can be divided into a finite number of sub-regions homogeneous with respect to the birth and death-rates, then the population movement between the sub-regions has to be taken into account to explain the population-behaviour over time in both the sub-regions of the closed region and the closed region itself. Even when the closed region is homogeneous with respect to the birth- and death-rates, the population-movement between the sub-regions has to be taken into account to explain the population-behaviour in the sub-regions of the closed region. Models built to explain or represent the population-behaviour in the sub-regions taking into account the population-movements may be called multiregional population-growth and migration models as opposed to the uni-regional population-growth models considered earlier. Some multi-regional population growth and migration models are considered in an earlier paper prepared by the author.<sup>2</sup> When data on population-movements between the sub-regions are not available, some rather very restrictive