



Practitioner's Guide:

Population Forecasting



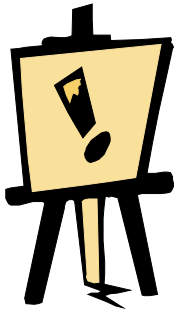
Deutsche Gesellschaft für
Technische Zusammenarbeit
(GTZ) GmbH



Bundesministerium für
wirtschaftliche Zusammenarbeit
und Entwicklung

Population Forecasting

Brief Description

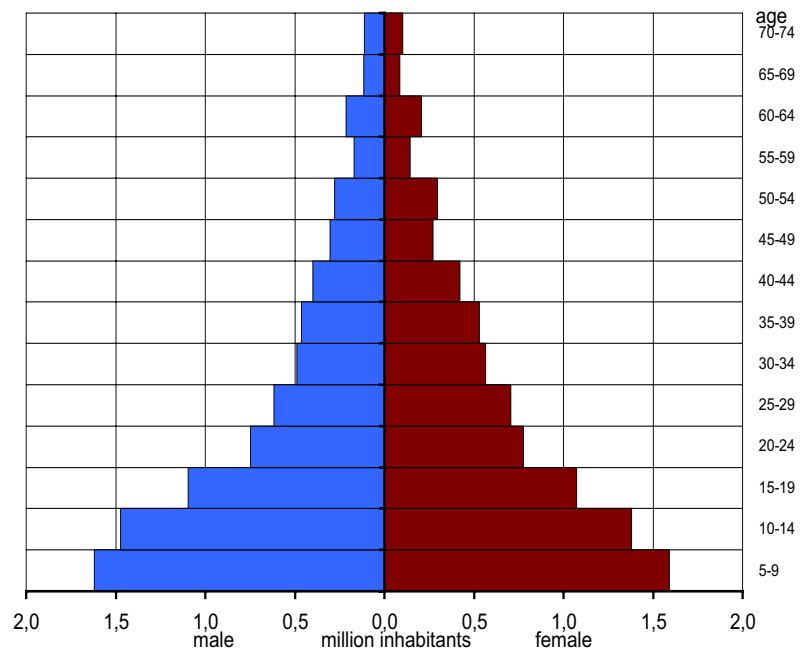


Forecasting the population growth is essential for every planner, as you are planning for the future. It is, therefore, important to know how many people will be living in the area or the place of concern.

In general, one calculates several projections for the same place or area making various assumptions. Population development is a dynamic process, so for forecasting population different assumptions are made on the natural development, fertility and mortality, as well as on migration behaviour. This gives a range of population to count with in the future.

To achieve relatively reliable results for a population forecast, basic data needed are a population census for the given area with exact data on age for both sexes. For natural population development, data needed are age specific fertility rates, age and sex specific mortality rates and the trends of change over a period of a minimum of ten years. For migration, also age and sex specific migration rates are needed. Based on that the calculations can be made. The further away the given time in future the more inaccurate the forecast will be, as trends may change.

Where the data base is limited, only simple projections are possible. Trends of natural population development can be derived from data, usually published for the whole country as census results. From the latest census data and the previous census data one can calculate the annual natural growth rate, assuming that in- and out-migration of the country is somewhat balanced. Trends for internal migration are more difficult to obtain.



Population Forecasting

Proposed Main Users

Private and public sector regional, urban or sectoral planners.



Purpose of the Method



Population projections provide information on the projected population at a given point in time. The result provides the basis for many planning steps.

For example, if the planner wishes to analyse and plan developments in the health care sector and the local standard for a hospital is, say, 5 beds per 100 inhabitants. On other hand the capacity of the local hospital is 600 beds, then this would mean that the hospital can handle a town with a capacity of 10,000 people. If the population is projected over a period of ten years then at a nominal growth rate of 2% this would result in a projected population of 12,400. The result is that either the hospital has to be extended or a second hospital has to be built. The same considerations would have to be applied for other social infrastructure.

At the same time, budget allocations have to be made to increase water supply, sewerage treatment and other physical infrastructure, etc.

Population Forecasting

Advantages



- ▶ Population projections give an indication on how many people will need goods and services in a given time in a given place or region.
- ▶ It provides the basis for calculating the future land use needs.
- ▶ The larger the area, the better the forecast results will be.
- ▶ It can be calculated easily.

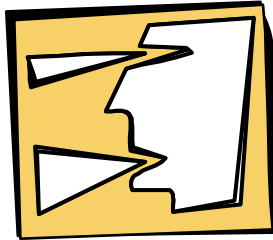
Limitations



- ▶ The “better” the projection, the more specific data is needed for the calculation.
- ▶ It gives only an indication of the future population, never an exact figure.
- ▶ The calculation is based on assumptions that might change over time.
- ▶ The migration component of population forecasts depends on many variables so that this data is extremely difficult to calculate.
- ▶ The smaller the place the more unreliable the forecast will be.

Population Forecasting

Principles and General Procedures



In general, data bases in developing countries on population development are limited. Simple population projections are, therefore, the only possible population forecasts.

For a simple population forecast, using a spreadsheet programme (e.g. Excel) the following steps are recommended:

- 1 Take the latest and the previous population census for the region (usually a census is undertaken every ten years).
- 2 Calculate the annual growth rate between these censuses.
- 3 Apply this annual growth rate to calculate the future population for the region e.g. for a five, ten year, or fifteen year period of time.
- 4 For population figures above 10,000 the figures are usually rounded up to the next 1000 (e.g. 47,538 becomes 48,000) and if the figure is below 10,000 then it is rounded up to the next 100 (e.g. 2,871 becomes 2,900).

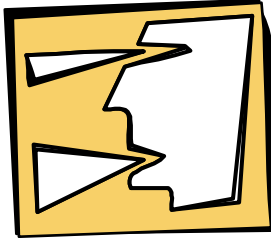
This simple population forecast will provide a continuation of the current trend, it disregards both natural and economic changes of the population development, which generally influences migratory patterns.

In order to develop an "improved" population forecast the following steps should be undertaken:

- 1 Take the latest available census of population for your country and the previous census.
- 2 Calculate the annual growth rate between these censuses
- 3 Take the latest available census of population for your region and the previous census
- 4 Calculate the annual growth rate between these censuses
- 5 Compare the growth rates; the difference will give you information on the migration to or from your region
- 6 Apply the annual growth rates to calculate two variants of the future population of your region, variant 1 with natural population increase, variant 2 with natural population increase plus migration

Population Forecasting

Principles and General Procedures



The improved population projection will provide a population range for the projected period of time (either five, ten or fifteen years).

In order to be able to further improve the quality of the projections it is worth making use of any demographic data that is available in the country (i.e. UN Demographic yearbook, statistical yearbook, etc.). In most cases assumptions have been made about the future demographic trends e.g. the expected development of the birth rates (as a result of family planning work) as well as death rates (due to health improvement programmes). Taking this data one can adjust the annual growth rates for the future and apply them in the population projections.

As soon as new census data is available, the existing projections have to be updated on the basis of the new data.