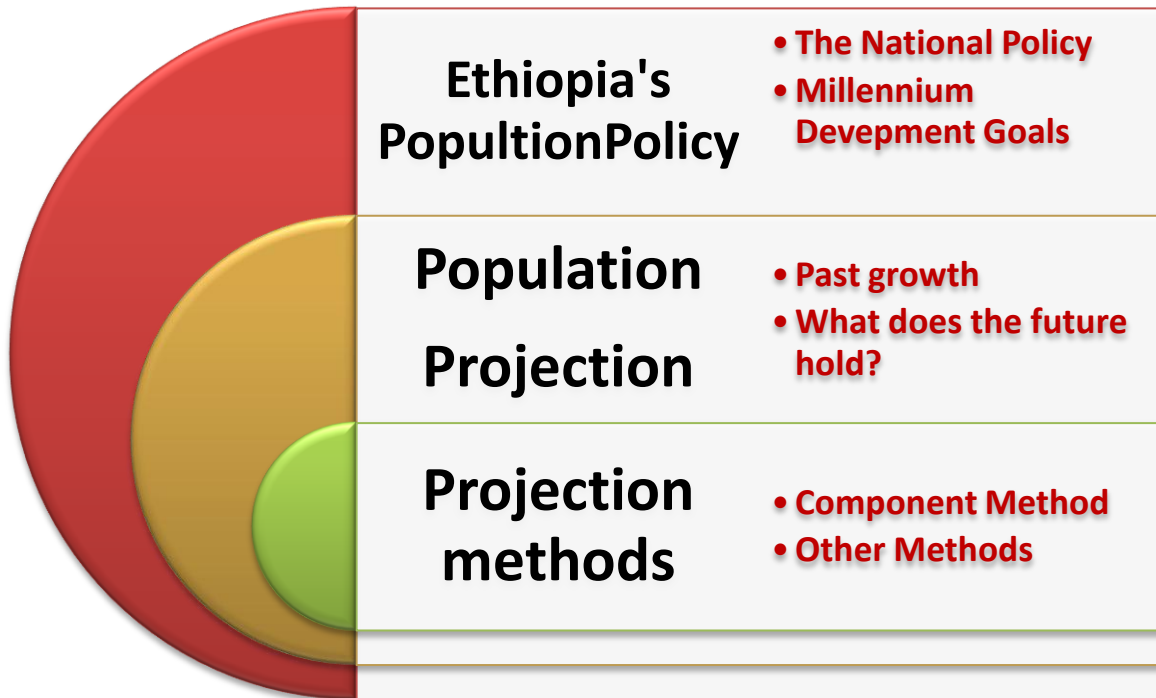


# Population Policy and Projection

**LESSON  
10**

**AYNALEM ADUGNA, JULY 2014**

**[WWW.ETHIODEMOGRAPHYANDHEALTH.ORG](http://WWW.ETHIODEMOGRAPHYANDHEALTH.ORG)**



## Population Policy and Projection

“Population policy may be defined as deliberately constructed or modified institutional arrangements and/or specific programs through which governments influence, directly or indirectly, demographic change” [1].

A country with strong economy, society in harmony, optimal population numbers relative to available resources, abundant natural resources and favorable climate, etc might still need a population policy. However, since no country in the world has all of these fulfilled all countries need population policies.

Click here to return to the main page → [www.EthioDemographyAndHealth.Org](http://www.EthioDemographyAndHealth.Org)

“Experience over the last couple of decades in Ethiopia has shown that as human numbers increased, the population carrying capacity of the environment decreased. A high population growth rate induces increased demand for resources and the rate at which these resources are exploited. In Ethiopia, where technology has not kept pace with the demands for greater productivity, environmentally harmful and economically counter-productive methods of exploiting land and associated resources ( forests, animal resources, etc.) are resorted to in order to meet immediate needs. As a consequence of this, climatic conditions are becoming erratic and soil quality is declining at an alarming rate”. [2]

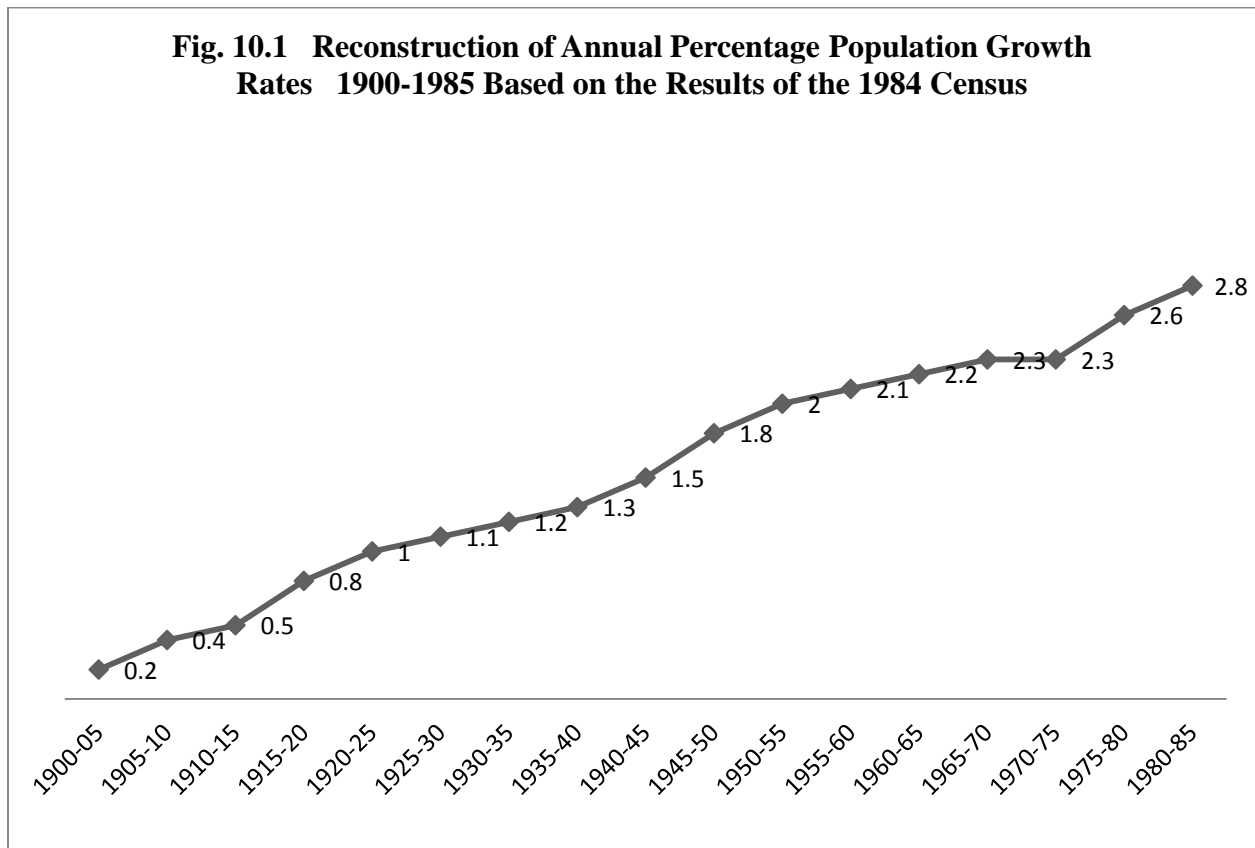
Ethiopia needs a population policy for a number of reasons:

- Population growth has outpaced economic growth for much of the last half century. Which means that a lot more people have had to make do with a lot less, thereby, growing ever poorer.
- Despite arguments to the contrary it is evident that traditional resource-use practices have led to the near-destruction of the environment in lands long settled by sedentary agriculturalist, particularly in the northern half of the country.
- No country has ever witnessed an economic and social transformation (otherwise referred to as development) without first limiting, often drastically, its population growth rates while at the same time increasing its resource base through improved productivity enabled by technological change.
- It has joined in the global effort to improve the lives and living standards of its people through a universal plan, also referred to as the Millennium Development Goals (MGD), launched by the United Nations. None of the goals can come to fruition without a sound and sensible policy to limit population growth.

## Population Growth

If the numbers in Figure 10.1 could be taken at face value, the inference would be that the rate at which the Ethiopian population grew annually increased fourteen-fold from 0.2 percent in 1900 to 2.8 percent between by the time of the first Population and Housing Census (1984). The starting rate of 0.2% per year at the dawn of the 20<sup>th</sup> century when the country’s population was estimated to be just under 12 million implied a doubling time of 140 years while the ending rate of 2.8% translated into a doubling time of only 25.7 years. This represents a significant increase in population on par with rates of growth recorded in the rest of Sub-Saharan Africa, and some Middle-Eastern countries. The Ethiopian population doubled (from its 1900 size) in sixty years (rather than 140 years) to reach 23.5 million in 1965. It doubled again in just 25 years to reach 48 million in 1990. The phenomenal growth was fueled by the combined impacts of increased fertility and declining mortality. The total fertility reached a high of 7.7 births in the early 1990s before coming down to 5.9 by the year 2000. Infant mortality dropped from 155 in 1970 to 97 in 2000. [3]. Challenges remain, however, because of [4]:

- 1- Increased population momentum due to rising population of women in their reproductive years. The rate of increase from this group and all other groups combined eventually level off at about 2.7%;
- 2- Lower mortality, and
- 3- High rural fertility, which seems to have stalled. Rural TRF is about 6.0 nationally despite an increase in contraceptive prevalence rate [CPR]



Source: [2]

The projected rates for subsequent years (based on the 1994 census) are as follows:

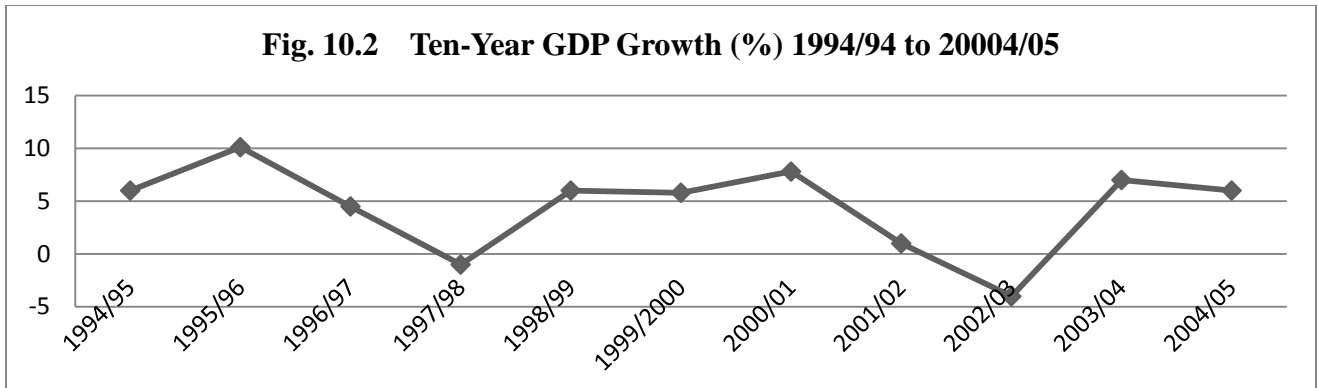
1995-2000	2.92
2000-2005	2.73
2005-2010	2.62
2010-2015	2.44
2015-2020	2.26
2020-2025	2.05

Source [2]

The table above suggests that population growth rates in Ethiopia is presumed to have peaked at 2.9% in the 1995–2009 period after which a regime of sustained decline was supposed to set it.

## **Economic Growth: Implications for Population Growth**

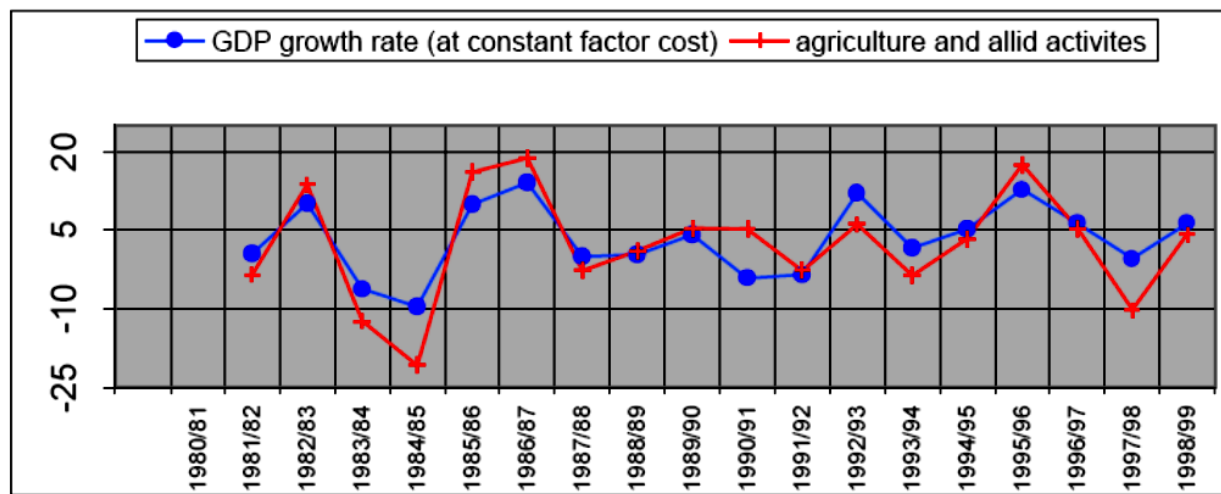
Percentage GDP growth in Figure 10.2 gives a marked contrast to the population growth rates (Fig. 10.1), the main difference being the uneven and short-lived trend of a rise in GDP followed by a marked decline, or even a negative growth. The average growth rate for the decade under consideration (4.5%) represents a significant improvement over GDP growth in decades before but was inadequate to erase the deficits accrued in past decades and bring the country into sustainable population-resource equilibrium, or list its people above poverty levels. Moreover, the draught and food shortages and the border war with Eritrea around the turn of the century helped throw the anemic growth into a downward spiral of economic contraction. Meanwhile, the population growth continued at unprecedentedly high rates adding two million or more new mouths to feed ever year.



Source [5]

Figure 10.2 is good reminder of the direct link between agriculture and GDP growth trends in Ethiopia. They move in lock-steps year after year. Unfortunately, Ethiopian farmers (fourth fifths of the population is engaged in agriculture) have not been empowered or equipped to be careful stewards of the land to which the welfare of the nation is so closely linked, and limit the risk of famine or death.

**Fig. 10.3 Annual Growth Rate of Real GDP and Agricultural GDP (1981 – 1999)**



Source: [6]

## Environmental Destruction

The image Ethiopia - its citizens and government - seek to project to the outside world are often prefaced by the expression “three thousand years of independence”. Any visitor to the country will note, however, that the long history of uninterrupted agrarian settlement with millennia of unchanging farming techniques has had great environmental costs. By the country’s government’s own admission:

The proportion of land with forest cover has been diminishing at alarming rates. The land area covered by forests has gone down from approximately 40.0% at the turn of the century to approximately 3.0% at the present time. The annual rate of deforestation is estimated at 88.000 hectares per year while the rate at which this loss is being replaced through afforestation is estimated at 6.000 hectares a year. The soil has been and continues to be eroded in the absence of coherent and sustained conservation efforts. Popular awareness of conservation issues is, still, in its nascent stage. It is estimated that over two billion cubic meters of soil is being washed down, annually, by torrential rains down the Nile valley leaving most of the Ethiopian highlands with seriously eroded landscape and severely reduced population carrying capacity. As population increased the demand for fuel and construction materials increased resulting in the practice of reckless tree felling. State ownership of forests and the exclusion of local communities from the management and legitimate utilization of forest resources may have contributed to the lack of any consistent effort to replace trees cut for various purposes. [7]

## Millennium Development Goals

The Millennium Development Goals (MDGs) are a set of eight important principles and goals ranging from poverty reduction to universal primary education agreed to by member states of the United Nations and international development agencies. The time-bound goals are as follows [8]:

1. Eradicate Extreme Poverty and Hunger.
2. Achieve Universal Primary Education.
3. Promote Gender Equality and Empower Women.
4. Reduce Child Mortality.
5. Improve Maternal Health.
6. Combat HIV/ AIDS, Tuberculosis, Malaria and other diseases.
7. Ensure Environmental Sustainability.
8. Develop a Global Partnership for Development.

Achieving these tasks would be major challenge for Ethiopia due mainly to the effects of high population growth and its negative impacts on the future of the economy and society; hence, the need for population policy. The following table is obtained from a World Bank report on Health and poverty in Ethiopia [7]. It shows the Ethiopian government’s planned objectives and targets in the areas of health and poverty.

Click here to return to the main page → [www.EthioDemographyAndHealth.Org](http://www.EthioDemographyAndHealth.Org)

Objective	HSDP* Targets/Measures (2002/03-2004/05)	Minimum Development Goals (MGD)
Increase life expectancy of the population	<ul style="list-style-type: none"> <li>• Increase life expectancy at birth from 52 in 2000/01 to 58 years</li> <li>• Reduce infant mortality from 97 per thousand births in 2000/01 to 85</li> <li>• Reduce maternal mortality 500-700/100000 live births in 2000/01 to 400-500</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce by two-thirds between 1990 and 2015</li> <li>• Reduce by three-quarters between 1990 and 2015</li> </ul>
Increase access for health services	<ul style="list-style-type: none"> <li>• Increase health care coverage from 52% in 2000/01 to 65%</li> <li>• Promote contraceptive coverage from 18.7% in 2000/01 to 65%</li> <li>• Increase EPI coverage from 41.9 % , in 2000/01 to 65%</li> <li>• Increase health budget share</li> </ul>	
Enhance health opportunity and promote disease prevention and control	<ul style="list-style-type: none"> <li>• Reduce malaria prevalence from 7.7/1000 in 2001/02 to 6.2/1000</li> <li>• Maintain HIV/AIDS prevalence (7.3% in 2001/02) by keeping the rate the same 7.3%</li> </ul>	<ul style="list-style-type: none"> <li>• Halted by 2015 and began to reverse the incidence</li> <li>• Halted by 2015 and begun to reverse the incidence of HIV/AIDS</li> </ul>

\* Health Sector Development Program



## **POPULATION POLICY**

Ethiopia has a population policy which, largely, remains unimplemented. The government currently in power formulated a policy guide for the country in 1993 to bring population growth rates in line with other policy targets and achieve socio economic advancement. The details of this policy (given below) can be accessed from a United Nations web site [8].

### **PRIORITY AREAS OF POPULATION ACTIVITIES**

- Diversifying and expanding the coverage of national family planning through clinical and community-based outreach services;
- Enabling and supporting the role and participation of non-governmental organizations in the delivering family planning and related services;
- Creating an enabling environments that will give users the widest possible choice of family planning and contraceptive services by diversifying the methods-mix and by making them available throughout the country

### **General Objectives:**

- Narrowing, or closing the gap between high population growth and low economic productivity through planned reduction of population growth rates and increasing economic productivity and investment returns;
- Expediting economic and social progress through integrated development programs designed to facilitate the structural differentiation of the economy and employment;
- Lowering migration rates to urban centers;
- Adopting appropriate environmental protection/conservation measures by improving the carrying capacity of land and other resources
- Liberating the productive capacity of women by raising their economic and social status through education and by freeing them from the restrictions and drudgeries of traditional life thereby making it possible for them to participate fully in the larger society;
- Significantly improving the social and economic status of other vulnerable groups such as youth, children, and the elderly.

## Specific Objectives and Strategies [8]:

- Reducing the total fertility rate (estimated at 7.7 in 1993) to approximately 4.0 children per woman by the year 2015;
- Reducing maternal mortality rates, infant mortality and childhood morbidity and mortality
- Boosting female participation at all levels of the educational system;
- Ensuring property rights and access to gainful employment for women by removing all legal customary practices inhibiting the social and economic advancement of women;
- Ensuring spatially balanced population distribution patterns with a view to maintaining environmental security and extending the scope of development activities;
- Raising agricultural productivity and introducing off-farm non agricultural activities and income to ensure employment diversification;
- Educating the public about the virtues of small families and the relationship it has with social welfare, economic security, and environmental sustainability.

## STRATEGIES

- Mobilizing public and private resources to expand clinical and community based contraceptive distribution services;
- Promoting the virtues of breast-feeding as a as an effective remedy to early childhood malnutrition and as natural contraceptive method to space pregnancies.
- Increasing the minimum age at marriage for girls to 18 years in place of the current lower limit of 15.
- Implementation of effective counseling services for females in the educational system with the view to reducing the high drop-out rates;
- Provision of career counseling for girls in secondary and tertiary educational institutions to enable them to make appropriate career choices;
- Striving to achieve a better integration of women in the modern sector of the economy;
- Providing technical and credit support to men and women who have the desire and aptitude for engaging in small to medium sized businesses;
- Enabling families to acquire and put to use the education and information widely available via formal and informal media;
- Provision of low cost radio receivers and other media tools such as flyers to disseminate knowledge better.
- Amending sections of the law limiting or prohibiting the advertisement, propagation and popularization of any contraceptive method;
- Incorporating gender issues and concerns in all activities by establishing within government and non-governmental organizations, appropriate units to deal with these issues;

- Giving priority to the establishment of teenage and youth reproductive health services, and counseling centers.
- Enabling research program development in reproductive health;
- Strengthening programs designed to promote male involvement in family planning;
- Increasing the availability of and access to male-oriented contraceptive methods

## POPULATION ESTIMATES

Currently, the main sources of population statistics are censuses. “However, populations changes constantly and sometimes quite rapidly, making census statistics for every tenth year, even every fifth year, inadequate for most purposes” [9]. The solution most government agencies, academics, business marketers, and research institutions resort to in order to generate population data outside of census or survey dates is called *estimation*.

Estimates can be:

- Intercensal estimates – relate to dates intermediate to two censuses
- Postcensal estimates – refer to past or current date following a census
- Projections – “conditional estimates of population at future dates”

“Both postcensal estimates and projections can be regarded as extrapolations, and intercensal estimates as interpolations...It should also be noted that estimates must frequently be made for areas that have never had an accurate census; hence there may be no base on which to extrapolate or interpolate estimates and they must be generated from alternate data sources and by alternate techniques” [9]

### Estimation: Component Method

A simple component method may be used when satisfactory census data are available together with accurate registrations of births, deaths, in-migrations, and out migrations. This can be done on a national or sub-national level.

$$P_t = P_0 + B - D + I - E$$

*where*

$P_t$  = Current population

$P_0$  = Base population

Click here to return to the main page → [www.EthioDemographyAndHealth.Org](http://www.EthioDemographyAndHealth.Org)

**B** = Births

**D** = Deaths

**I** = in-migration

**E** = emigration (or out-migration)

## Mathematical Extrapolation

“For countries lacking current administrative records on the components of population change...the figure for the base year is typically updated by use of an assumed rate of population increase”.

**Linear Change:** assumes a constant rate of change over a given period:

$$\Delta = (P_l - P_b) / (y)$$

Where  $\Delta$  is the average absolute change  
 $P_l$  is the population in the launch year  
 $P_b$  is the population of the base year, and  
 $y$  equals the number of years between the *base* and *launch* years

A projection using this method could be computed as:

$$P_t = P_l + (z)(\Delta)$$

- $P_t$  is the population in the target year
- $Z$  is the number of years between the target year  $t$  and the launch year  $l$
- $\Delta$  is the absolute change computed for the base period

## Geometric Change

$$r = [ (P_l / P_b)^{(1/y)} ] - 1$$

$r$  is the average annual geometric rate of change

$y$  is the number of years in the base period

A projection using this method can be computed as;

$$P_t = (P_l) (1 + r)^z$$

## Exponential Change

“The model for exponential change is closely related to the geometric one, but it views change as occurring continuously rather than at discrete intervals.” [9]

$$r = [ \ln (P_l / P_b) ] / (y)$$

Click here to return to the main page → [www.EthioDemographyAndHealth.Org](http://www.EthioDemographyAndHealth.Org)

A projection using this method can be computed as:

$$P_t = (P_1) (e^{r_z})$$

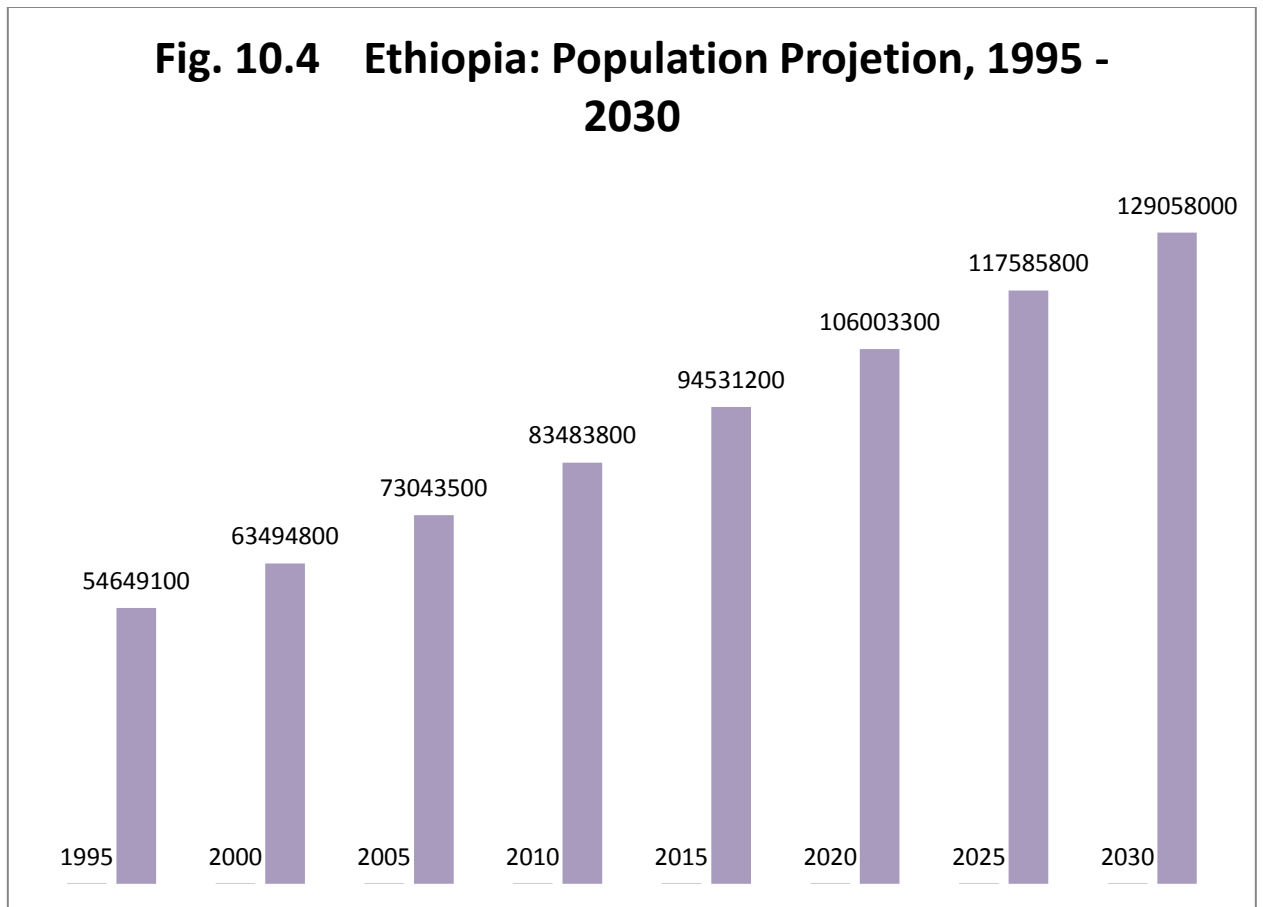
## Estimation Problems for Less developed Countries (LDCs)

The sporadic nature of data collection in less developed countries and the general public's low educational status as well as incomplete understanding of the need for truthful reporting of demographic events has rendered available data less reliable than in developed countries. "For example, ... people do not know their age with accuracy. Or there may be only one census from which to make inferences" [9].

## Population Projection for Ethiopia

Ethiopia's Central Statistical Authority (CSA) has been issuing population estimates annually by age and administrative divisions beginning in the 1960s when two national sample surveys were conducted – one urban, and the other one rural. Starting in the mid 1980's CSA based its yearly projections on the 1984 Population and Housing Census. Current estimates (including one for the year 2008) are a continuation of annual projected estimates published by the statistical office on the basis of the 1994 Population and Housing Census. CSA's reports give projections all the way to the year 2030. The projections are based on the assumption of moderate fertility and linear growth.

Estimates of the future population size and growth rate of Ethiopia with an assumption of moderate fertility decline (medium variant) indicate a substantial increase in the coming decades. Though the growth rate declines gradually, the population is expected to increase from the current 75 million to 83 million in 2010, 94.5 million in 2015 and will reach 129.1 million by 2030. [10]



Source: Based on [2]

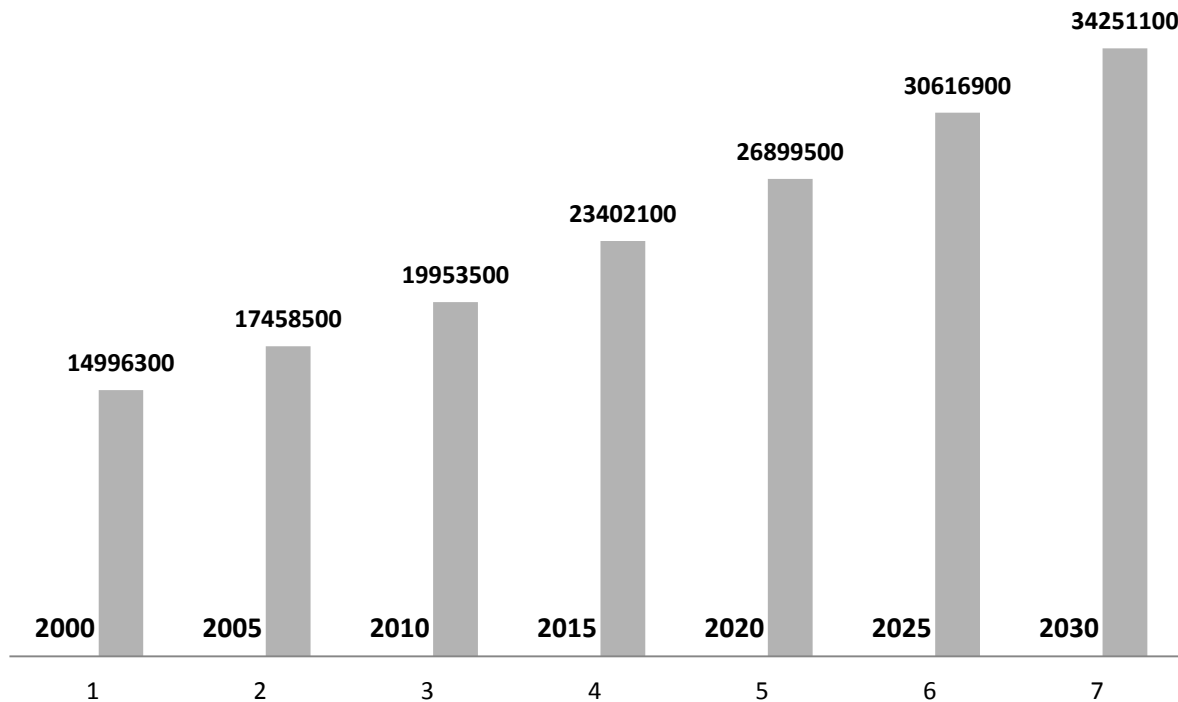
The forward estimation takes into account the projected decline in population growth rates from 2.9 (1995-2000) to 2.6 in the 2005-10 projection period, and to 2.0 in the 2020–2025 period [10]. The apparent contradiction between declining growth rates and increasing population numbers over time is explained by demographers in terms of a phenomenon known as population momentum.

**Population momentum:** The tendency for population growth to continue beyond the time that replacement-level fertility has been achieved because of a relatively high concentration of people in the childbearing years. For example, the absolute numbers of people in developing countries will continue to increase over the next several decades even as the rates of population growth will decline. This phenomenon is due to past high fertility rates which results in a large number of young people. As these youth grow older and move through reproductive ages, the greater number of births will exceed the number of deaths in the older populations". [11]

Figure 10.5 shows the projected population of Ethiopian women in their reproductive years, and explains graphically the scenario outlined in the above definition of population momentum.

Click here to return to the main page → [www.EthioDemographyAndHealth.Org](http://www.EthioDemographyAndHealth.Org)

**Fig. 10.5 Projected Number of Ethiopian Women in Their Reproductive Years (15 - 49)**



Source: Based on [2]

References:

1. Paul Demeny. Population Policy, and Concise Summary. Population Council. Policy Research Division.No. 173. 2003.
2. <http://cyber.law.harvard.edu/population/policies/ETHIOPIA.htm>
3. Carla Bielli, et. al. Population Growth and Environment in Ethiopia. In-depth Studies from the 1994 population and Housing Census of Ethiopia. Italian Multi-Bi Research Project ETH/92/P01. Central Statistical Authority (CSA). Addis Ababa Ethiopia. 2001.
4. Charles H. Teller et.al. The Lagging Demographic and Health Transitions in Rural Ethiopia: Socio-economic, Agro-ecological, and Health Service, Factors Effecting Fertility, Mortality and Nutrition Trends. Paper Presented at Session 104, population Growth and poverty Linkages in Africa. Fifth African Population Conference. Union of African Population Studies (UAPS), Arusha. Tanzania. 2007.

Click here to return to the main page → [www.EthioDemographyAndHealth.Org](http://www.EthioDemographyAndHealth.Org)



5. African Economic Outlook. Ethiopia. AFDB/OECD. 2004
6. Federal Democratic Republic of Ethiopia. Ministry of Water Resources. National Meteorological Services Agency. *Initial National Communication of Ethiopia to the United Nations Framework Convention on Climate Change (UNFCCC)*. Addis Ababa. 2001
7. Ethiopia. A Country Status Report on Health and Poverty. Draft Report No.28963-ET. The World Bank, Africa Region Human Development Report & Ministry of Health Ethiopia. 2004.
8. <http://www.un.org/popin/regional/africa/ethiopia/policy/>
9. Jacob S. Siegel and David A Swanson. *The Methods and Materials of Demography*. 2<sup>nd</sup> ed. Elsevier Academic Press. 2004.
10. Ethiopia: Population Images. Population Department Ministry of Finance and Economic Development. Addis Ababa. 2006.
11. <http://www.worldbank.org/depweb/english/modules/glossary.html>