FACTSheet 37 in a series
POPULATION ACTION INTERNATIONAL

The Importance of Population for Climate Change Challenges and Solutions

Climate change is one of the greatest challenges facing humanity in the 21st century. It has been historically driven by an atmospheric build-up of greenhouse gases (GHGs) generated mostly by the industrialized world. The consequences of climate change—more intense hurricanes and typhoons, rising sea levels, drought, heat waves, major disruptions to agriculture—will be felt by communities around the world.

- **Population trends play an important role in the larger context of economic, technological, and social trends that affect the climate system.** The majority of future population growth is likely to occur in areas of the world that are already beginning to experience climate change impacts, and this growth is likely to be concentrated in areas and among populations—poor, urban, and coastal—that are already highly vulnerable to climate change impacts. In addition, population trends are intimately connected to the growth of GHGs that cause climate change.

- **As the world seeks effective strategies to meet climate change challenges, population trends and related gender considerations should not be left out.** Many of the policies that affect population trends, such as meeting the demand for family planning and reproductive health services among the world's women and families, can play an important role in climate change adaptation and mitigation, but have not yet been incorporated into comprehensive climate change solutions.

Population Trends Will Expose More People to Climate Change Impacts, Especially in the Developing World

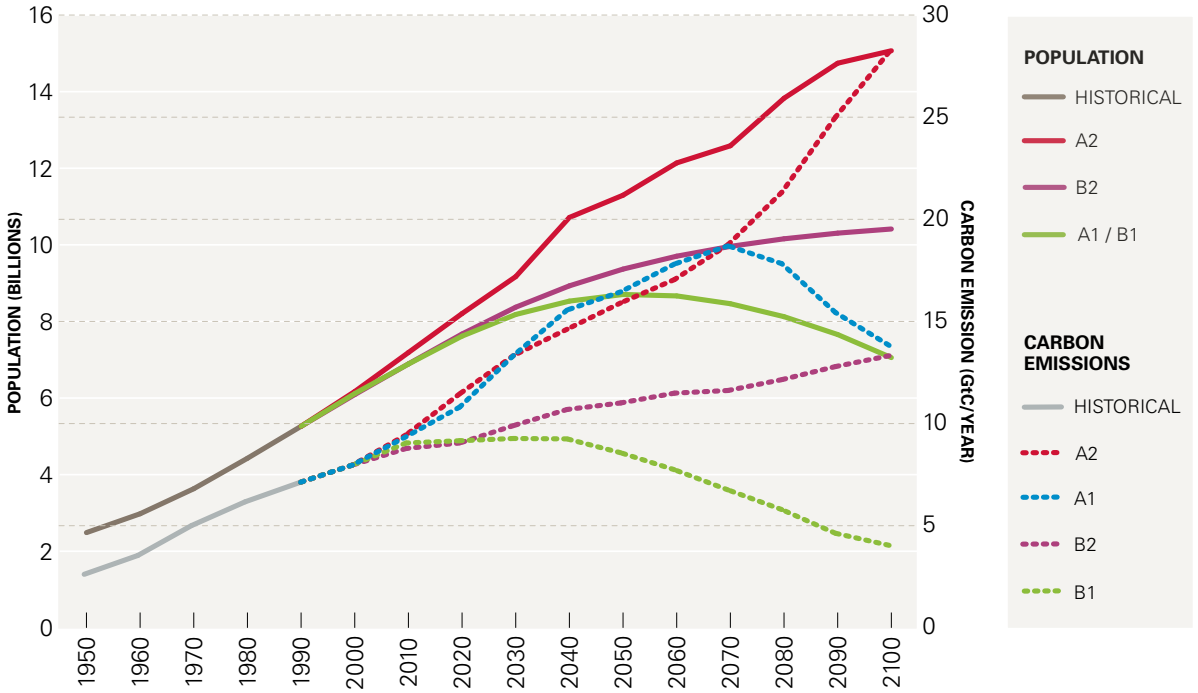
- **Areas of high population growth and high vulnerability to climate change impacts overlap.** Evidence suggests that the poorest countries and population groups are most vulnerable to climate change impacts.[1] Population growth is occurring most rapidly in the developing world, increasing the scale of vulnerability to projected impacts of climate change. Other demographic trends, such as urbanization in coastal areas and encroachment of populations into ecologically marginal areas, can exacerbate climate risks. Areas in which population trends are particularly relevant to climate change vulnerability and adaptation include:

  - **Water stress:** Population growth is already putting a strain on the world's limited supply of fresh water. Without taking into account the projected impacts of climate change, five billion people—more than half the world's population—are expected to live in water-stressed countries by 2050.[2] Anticipated changes in climate will exacerbate the problem of water shortages in these areas.

    Moreover, the anticipated retreat of glaciers has both direct impacts on populations such as landslides, flash floods, and glacial lake overflow, as well as indirect effects such as the disruption of water flows in rivers. By the end of the century, an estimated 40% of the world's population could be affected by loss of snow and glaciers in the mountains of Asia.[3]

  - **Extreme weather and sea level rise:** The impacts of extreme weather events and projected sea level rise are particularly significant due to high population density on and near coastlines and low-elevation zones.

Figure 1: Population Changes and Carbon Emissions Under IPCC SRES Scenarios



Data Sources: Figure is based on the output of the climate model MESSAGE by the International Institute for Applied System Analysis (IIASA).

Low elevation coastal zones cover 2% of the world's land area, but contain 10% of the world's population, and that population is growing fast.[4] In Bangladesh and China, for example, populations living in low elevation coastal zones grew at almost twice the national population growth rate between 1990-2000,[5] exposing disproportionately growing numbers of people to the negative effects of sea-level rise and extreme weather.

Agricultural production loss: Increases in temperature are expected to negatively affect agricultural production in the tropics and subtropics, where crops already exist at the top of their temperature range. Under middle range projections of population growth, agricultural production loss and an increase in the prices of crops due to climate change will lead to an additional 90 to 125 million people at risk of hunger in the developing world by 2080.[6]

Population Trends are Critical in Future Scenarios of GHG Emissions

In future climate scenarios generated by the Intergovernmental Panel on Climate Change (IPCC), higher population growth projections generally result in more GHG emissions. The IPCC scenarios are grouped into four families (A1, A2, B1, and B2) and each makes different assumptions about economic growth, technological change, and population growth. Population assumptions range widely, from a low population projection of 7.1 billion to a high of 15 billion in 2100. Looking at the outputs of climate change models driven by these scenarios, higher population growth is associated with more GHG emissions (see Figure 1), with a few key exceptions. For example, the effects of highly carbon-intensive economic growth and technological change can be more substantial than population growth on future carbon emissions, at least for several decades.[7]

Current climate change models likely underestimate the impact of demographic trends on GHG emissions growth. A weakness of the IPCC's current scenarios is that population size is the only demographic variable considered—no allowances are made for compositional changes within the population as it grows. Energy consumption patterns differ between rural

Table 1: Projected Population in Select Countries

COUNTRY	POPULATION IN 2010 (MILLIONS)	POPULATION IN 2050 (MILLIONS)	
		MEDIUM SCENARIO[A]	CONSTANT FERTILITY SCENARIO[B]
BANGLADESH	164	222	252
ETHIOPIA	85	174	288
GUATEMALA	14	27	42
HAITI	10	15	21
INDIA	1,200	1,600	2,000
RWANDA	10	22	32
UNITED STATES	318	404	425

Source: United Nations Population Division. 2009. World Population Prospects, The 2008 Revision. New York: United Nations.

[A] In the medium scenario, total fertility in all countries is assumed to converge eventually toward a level of 1.85 children per woman.
[B] In the constant fertility scenario, fertility remains at 2005-2010 levels through 2050.

and urban populations, between younger and older populations, and between households with many people versus households with fewer. The world is becoming increasingly urban and older, and household sizes are becoming smaller—but these changes have not yet been accurately accounted for in climate change models.[8] Population Action International is collaborating with other scientists to develop more sophisticated models that will allow for more accurate accounting of demographic variables in emissions scenarios.

Population Policies and Programs: Part of the Solution to Climate Change Challenges

The path of future population growth is uncertain. Recent United Nations population projections indicate that the world's population is likely to grow from today's 6.7 billion to somewhere between 8.0 to 10.5 billion by 2050.[9] According to U.N. demographers, achieving a "medium" population projection of 9.15 billion by 2050 will require expanded access to family planning programs, particularly in the least developed countries.[10] Table 1 provides sample population projections for several countries with high vulnerability to climate change impacts. Family planning and reproductive health programs, delivered according to the international consensus agreed to by 179 nations at the 1994 International Conference on Population and Development (ICPD) in Cairo, will help reduce vulnerability to climate change and slow the population trends that exacerbate climate change.

The global need to solve climate change is matched by local demand for family planning and reproductive health services. The U.S. and other governments and organizations must address the needs for reproductive health and family planning around the world. This will improve the health and well-being of women and families, while also slowing the growth of GHGs and reducing human vulnerability to climate change impacts. More than 200 million women around the world say they would prefer to avoid a pregnancy, but are not using a modern form of contraception.[11] In a number of nations, this unmet need exists among one-third or more of married women. And while the number of women of reproductive age worldwide continues to grow, the last decade has witnessed a significant decline in funding for family planning programs in international development assistance: between 1996 and 2006, donor funding for family planning programs declined by 30% globally.[12] Between 1995 and 2009, U.S. funding for these programs declined 35%.[13]

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