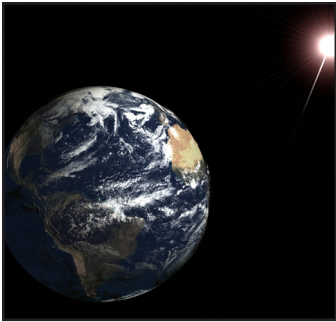


# Human Population Growth and Greenhouse Gas Emissions

Over the last century, human activity has led to a dramatic increase in the amount of greenhouse gases in the atmosphere. Most experts agree that this build-up of greenhouse gases has contributed to an increase of 1.3 degrees Fahrenheit in the Earth's average surface temperature over the past 100 years. Current rates of greenhouse gas build-up will cause further warming and induce additional changes in the climate system that would very likely be larger than those observed during the 20th century.<sup>1</sup>



## Climate Change Affects Human Populations

The expected consequences of such warming include major disruptions to agriculture, water supplies, and the diversity of life on Earth. Hurricanes and typhoons are likely to become more intense. Precipitation is expected to increase at high latitudes and decrease in subtropical areas. Moreover, if greenhouse gases continue to build at even a moderate rate, experts predict that sea levels will be 7 to 24 inches higher by 2100, causing devastating erosion and flooding of the coastal cities and villages where millions of Earth's inhabitants live.<sup>2</sup> This is likely to result in large-scale migration, especially in developing countries where coastal defenses are weaker and where many people are vulnerable to climate-induced changes in agricultural conditions, natural resource patterns, water supply and health conditions.



The world's population has doubled since 1965 and is currently growing by nearly 80 million people per year.

## And Human Population Will Affect Climate Change

The build-up of greenhouse gases in the atmosphere has been driven largely by growing consumption of fossil fuels in the industrialized world. But in looking to the future, the growth of greenhouse gas emissions will be determined by a number of factors, including the spread of technology, and patterns of economic growth and land use. The growth of the world's population will be a critical factor, as well.

The world's population has doubled since 1965 and is currently growing by nearly 80 million people per year. Demographers

at the United Nations project this growth will continue and for world population to be in the range of 7.8 billion to 10.8 billion by 2050.<sup>3</sup>

The overwhelming majority of this growth will occur in the developing world. As developing countries continue on a path of economic growth and industrialization, their contribution to global greenhouse gas emissions will increase. Due to the sheer volume of world population growth, reductions in greenhouse gas emissions resulting from shifts in energy use and sequestration will be partially offset by the increase in human activity resulting from an increase in population.

## A Complex Relationship

While the relationships between population growth, economic growth, poverty, land use, and the diffusion of technology are complex, the Intergovernmental Panel on Climate Change (IPCC) recognizes the role that future population growth can play in the growth of global greenhouse gas emissions. Varying assumptions about population growth, economic growth, and technological change are included in the IPCC's "emissions scenarios."<sup>4</sup>

Not surprisingly, the scenario that results in the smallest temperature increase by the end of the 21st century (1.8 degrees Celsius) incorporates the lowest population growth projection (7.1 billion people in 2100). However, further analysis is needed to isolate and highlight the specific contributions of population growth as a driver of climate change, and as a factor in human vulnerability to climate change impacts.

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# Population Programs: Promoting Climate Change Mitigation and Adaptation

## Slowing the Growth in Emissions

In addition to traditional mitigation measures such as alternative energy generation, energy efficiency, and carbon capture and storage, population programs—those that address unmet needs for reproductive health services around the world—can slow the rate of population growth, and therefore be part of a long-term strategy to reduce global greenhouse gas emissions.

Population programs, such as those initiated by the US Agency for International Development (USAID) and the United Nations Population Fund, ensure that women and couples around the world have access to voluntary family planning services and are free to choose the number and spacing of their children. These programs are:

- **Easy to implement technologically:** USAID, along with governmental and non-governmental partners, has forty years of experience in expanding access to family planning and reproductive health services, resulting in fertility declines in many parts of the world.
- **Already in demand among women:** More than 120 million married women around the world still have an unmet need for family planning (women who are sexually active and report that they would like to end or delay childbearing, but are not using a modern or traditional method of family planning).<sup>5</sup>
- **Inexpensive:** Providing contraceptives to all women with unmet need for modern contraception would cost an average of \$19 per user per year, providing substantial benefits in terms of saving lives. Addressing this

unmet need could also prevent 52 million unintended pregnancies, 22 million abortions, 7 million miscarriages, and 23 million unintended births.<sup>6</sup>

## Enhancing Community Resilience and Adaptive Capacity

At the local level, community-based population programs, especially those integrated with health and natural resource management activities, help to address dual goals of slowing population growth while strengthening the social, institutional, economic, and environmental capacity that communities will need to adapt to climate change.

A growing number of projects around the world are integrating population programs with traditional conservation and other natural resource management activities (see example below). These comprehensive community-based efforts are strengthening resilience and reducing vulnerability to the effects of climate change by

- Slowing the growth of population pressure on overtaxed and climate-stressed natural resources and biodiversity
- Enabling community stewardship and sustainable use of forests, soils, watersheds, coastal areas, and other climate-sensitive resources
- Building local awareness of the connections between environmental conditions, human health, and behavior; as well as the capacity to plan and manage resources in the context of these connections at the local level

### Building Resilience among Coastal Communities in the Philippines

Coastal resources and the people that depend on them are increasingly at risk in the Philippines: between 1966 and 1986, the productivity of coral reefs off the coasts of the Philippines dropped by one-third as the national population doubled. In response to these challenges, PATH Foundation Philippines, Inc. established the Integrated Population and Coastal Resource Management (IPOPCORM) Initiative in communities in two Philippine provinces.

IPOPCORM seeks to improve food security and overall quality of life in communities that depend on aquatic resources. Its community-based approach includes education and outreach on population, environment, and food security relationships; environmentally-friendly livelihood development; reproductive health service delivery; and community-based efforts to restore coastal resources, including mangrove reforestation and coral reef protection. By collaborating with local government and NGO partnerships, IPOPCORM is improving reproductive health outcomes, enhancing community-based management of coastal and marine resources, and building capacity for a more sustainable future in which coastal communities will be better able adapt to the impacts of climate change.

Source: Path Foundation Philippines, Inc.: <http://www.pfpi.org/ipopcorm.php> (accessed 7 January, 2008)

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