

WHY POPULATION MATTERS TO CLIMATE CHANGE



Demographic trends have an important connection to both the challenges and solutions to the problem of climate change. Rapid population growth exacerbates vulnerability to the negative consequences of climate change, and exposes growing numbers of people to climate risk. Population growth is also one of the drivers of the growth in greenhouse gases that contribute to climate change. Meeting people's needs for family planning and reproductive health builds resilience to climate change impacts. Meeting family planning needs will also stem population growth, easing challenges associated with adapting to climate change impacts and reducing the growth of greenhouse gas emissions.

The State of Climate Change

Historically driven by a build-up of greenhouse gases generated mostly in the industrialized world, the consequences of climate change—including floods, droughts, extreme weather, and declining agricultural production—will affect everyone. In many of the poorest areas of the world, shifting temperature and precipitation patterns are already damaging agricultural production and making scarce water supplies even more difficult to manage. Storms of greater frequency and severity threaten growing coastal megacities, where millions live without adequate shelter or infrastructure.

Addressing climate change requires two major types of action. The first is *mitigation*, or actions to reduce emissions stemming from the burning of fossil fuels and the loss of forests. But even with aggressive mitigation action, the increased concentration of greenhouse gases in the atmosphere has already disrupted the climate system.¹ Therefore, the need to effectively cope with those impacts means that *adaptation* has become increasingly important.

Links between Population and Climate Change Adaptation

Areas of high population growth and high vulnerability to climate change impacts overlap. Evidence suggests that the poorest countries and poorest groups within a population are most vulnerable to climate-related hazards such as floods, droughts, and landslides.² Many developing countries are currently experiencing rapid population growth, increasing the number of people who will be exposed to projected impacts of climate change. Other demographic trends, such as urbanization in coastal areas and encroachment of populations into ecologically marginal areas, such as hillsides or degraded land, can exacerbate climate risks.

The governments of Least Developed Countries (LDCs) have assessed their climate change vulnerabilities and identified actions needed to cope with climate change impacts in National Adaptation Programmes of Action (NAPAs). In 37 of 41 NAPAs, rapid population growth is identified as a

factor that exacerbates climate change vulnerability.³ Many also connect population pressures to natural resource depletion or degradation that will hinder adaptation to climate change. For example, Haiti's NAPA states that population growth is "an important factor of pressure on the environment," and population pressure is directly linked to deforestation in the NAPAs of Sierra Leone, Solomon Islands, Rwanda, Mozambique, and Uganda.⁴

Population growth is already putting a strain on the world's limited supply of freshwater. More than 45 countries are currently experiencing water scarcity or stress, with the majority of these countries in Africa.^{5,6,7} The average population growth rate in these countries is 2.5 percent, markedly higher than the global average population growth rate of 1.1 percent, deepening challenges of water scarcity as the amount of renewable freshwater per person declines. Climate change increases the variability of precipitation patterns, and a loss of predictable rainfall can make limited water supplies in these countries even more difficult to manage.⁸

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. Low-elevation coastal zones cover two percent of the world's land area, but contain 10 percent of the world's population, and that population is growing fast.⁹ In Bangladesh and China, for example, populations living in low elevation coastal zones grew almost twice as fast as the national average between 1990-2000,¹⁰ exposing disproportionately growing numbers of people to the negative effects of sea-level rise and extreme weather.

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 place an additional 90 to 125

million people in developing countries at risk of hunger by 2080.¹¹

Though everyone will be affected by climate change impacts, in many places, women will suffer the most. Physical and cultural factors contribute to women's disproportionate vulnerability to the impacts of climate change.¹² In many societies, as the primary providers of water, food, and fuel, women bear additional burdens as these resources become scarce or unpredictable in supply. Women are also more likely to die in the event of natural disasters.¹³

Population Action International's interactive online database, *Mapping Population and Climate Change*, indicates 26 population and climate change "hotspots." These are countries with a low climate change resilience rating that are experiencing rapid population growth and high projected declines in agricultural production (see Figure 1).¹⁴ Nine of these countries

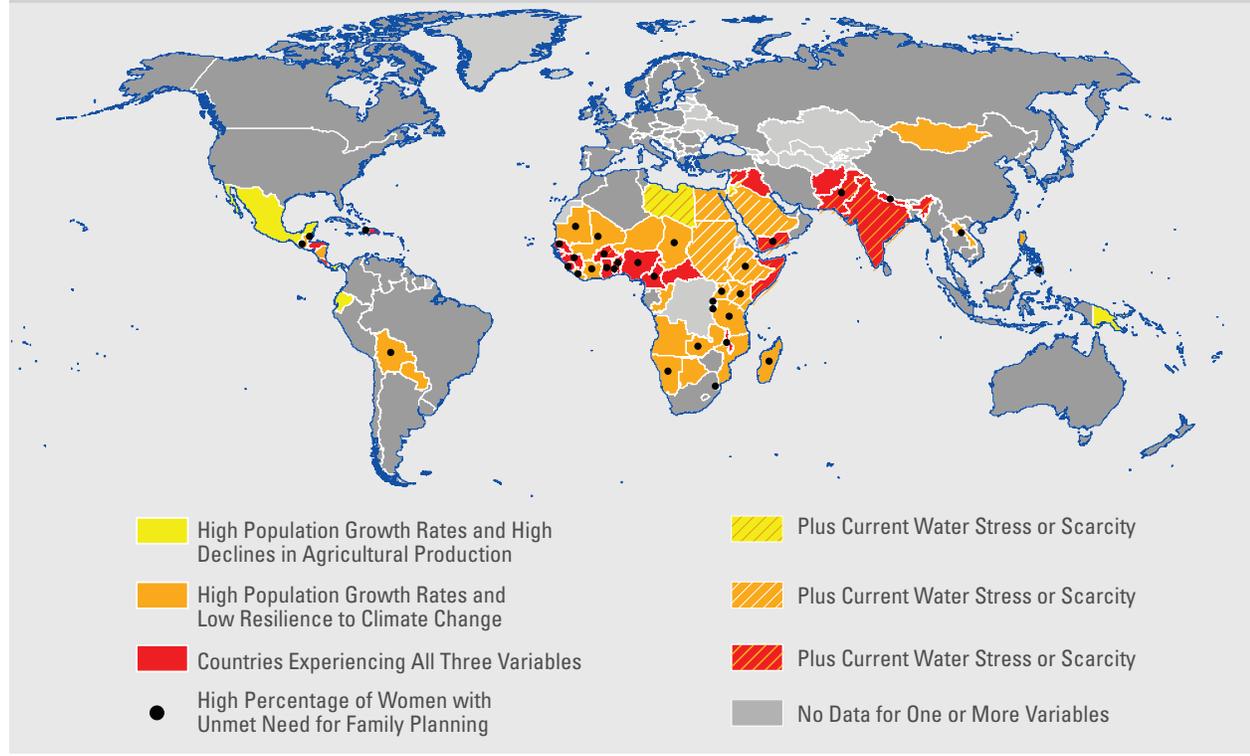
are already experiencing water stress or scarcity.

In hotspot countries, about one in four married women would like to avoid pregnancy, but are not using modern family planning. The average number of children born to each woman in hotspot countries is 4.6, and the average population growth rate is 2.2 percent. If unchanged, this rate of growth would result in a doubling of the population in 31 years.¹⁵

Building resilience can be difficult when women lack the ability to determine the number and spacing of their children, as frequent childbearing and high fertility can have negative impacts on the health and well-being of women and their families.¹⁶ In a 2009 study in Ethiopia, men and women in rural and urban areas expressed support for the use of family planning because they perceived families with fewer children as better positioned to deal with current environmental challenges.¹⁷

Figure 1: Population and Climate Change Hotspots

High rates of population growth intersect with negative consequences of climate change in many countries. Women in many hotspot countries also have limited access to reproductive health and family planning services. Investments that expand access to family planning could help to reduce vulnerability and increase resilience in the face of climate change impacts.



Source: Population Action International (PAI). *Mapping Population and Climate Change*. Washington, DC: PAI.

Endnotes

- 1 Intergovernmental Panel on Climate Change. 2007. *Climate Change 2007: Synthesis Report. Contributions of Working Groups I, II, and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.* Geneva: IPCC.
- 2 Jiang, L and K Hardee. 2009. *How Do Recent Population Trends Matter to Climate Change?* Washington, DC: PAI.
- 3 Hardee, K and C Mutunga. 2009. Strengthening the link between climate change adaptation and national development plans: lessons from the case of population in National Adaptation Programmes of Action (NAPAs). *Mitigation and Adaptation Strategies for Global Change.* 15(2): 113-126.
- 4 Ministère de l'Environnement. 2006. *Plan d'Action National d'Adaptation (PANANA).* Port-au-Prince: Ministère de l'Environnement.
- 5 United Nations Population Division. 2011. *World Population Prospects: The 2010 Revision.* New York: UN Population Division.
- 6 Food and Agriculture Organization of the United Nations (FAO). 2011. *Aquastat Country Database.* Rome: FAO.
- 7 Falkenmark, M and C Widstrand, 1992. "Population and Water Resources: A Delicate Balance." *Population Bulletin* 47(3):1-36.
- 8 Analysis based on Population Action International's *Mapping Population and Climate Change* website: http://www.populationaction.org/Publications/Interactive_Databases/climate_map.shtml.
- 9 McGranahan, G, D Balk, and B Anderson. 2007. "The rising tide: assessing the risks of climate change and human settlements in low elevation coastal zones." *Environment and Urbanization* 19: 17-37.
- 10 McGranahan, Balk, and Anderson. 2007.
- 11 Parry, M, L, C Rosenzweig and M Livermore. 2005. "Climate change, global food supply and risk of hunger." *Philosophical Transactions of The Royal Society (B)* 360:2125-2138.
- 12 United Nations Population Fund (UNFPA). 2009. *State of World Population 2009: Facing a Changing World: Women, Population and Climate.* New York, NY: UNFPA.
- 13 Ibid.
- 14 Analysis based on Population Action International's *Mapping Population and Climate Change* website: http://www.populationaction.org/Publications/Interactive_Databases/climate_map.shtml. "Low resilience countries" are those in the lower two quartiles of the Vulnerability-Resilience Indicators Model. "High population growth" is defined as above the median population growth rate of 1.33%. "High projected decline in agricultural production" are those where the projected declines in relative terms are above the median of all countries expected to experience decline between 1990 and 2020.
- 15 Population Action International (PAI). *Mapping Population and Climate Change.* Washington, DC: PAI.
- 16 Cleland, J, S Bernstein, A Ezeh, A Faundes, A Glasier, and J Innis. 2006. "Family Planning: The Unfinished Agenda." *The Lancet* 368: 1810-27.
- 17 Kidanu, A, K Ravin and K Hardee. 2009. "Linking Population, Fertility and Family Planning to Resilience and Adaptation to Climate Change: Views from Ethiopia." Addis Abab, Miz-Hasab and Washington, DC: PAI.
- 18 Nakicenovic, N, O Davidson, G Davis, A Grubler, T Kram, E Rovere, B Mertz, T Morita, W Pepper, H Pitcher, A Sankovski, P Shukla, R Swart, R Watson, and Z Dadi. 2000. *Special Report on Emissions Scenarios: A Special Report of Working Group III of the Intergovernmental Panel on Climate Change.* Cambridge, UK: Cambridge University Press.
- 19 O'Neill, B, M Dalton, R Fuchs, L Jiang, S Pachauri, K Zigova. 2010. "Global demographic trends and future carbon emissions." *Proceedings of the National Academies of Science.* 107 (41) :17521-17526.
- 20 Ibid.
- 21 Ibid.; Moreland S, E Smith and S Sharma. 2010. *World Population Prospects and Unmet Need for Family Planning.* Washington, DC: The Futures Group.
- 22 Pacala S and R Socolow. 2004. "Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies." *Science* 305: 968-982
- 23 O'Neill, Dalton, Fuchs, Jiang, Pachauri, and Zigova. 2010.
- 24 Enkvist, P, T Naucler, and J Rosander. 2007. "A Cost Curve for Greenhouse Gas Reduction." *The McKinsey Quarterly.* New York: McKinsey & Company.
- 25 Singh, S, J E Darroch, L S Ashford and M Vlasoff. 2009. *Adding It Up: The Costs and Benefits of Investing in Family Planning and Maternal and Newborn Health.* New York: Guttmacher Institute and United Nations Population Fund (UNFPA).; Dennis, S and C Mutunga. 2010. *Funding Common Ground: Cost Estimates for International Reproductive Health.* Washington, DC: PAI.
- 26 Wheeler, D and D Hammer. 2010. "The Economics of Population Policy for Carbon Emissions Reduction in Developing Countries." CGD Working Paper 229. Washington, DC: Center for Global Development.
- 27 Moreland, Smith, and Sharma. 2010.