

# WHY POPULATION MATTERS FOR 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.<sup>1</sup> Therefore, the need to effectively cope with those impacts means that *adaptation* has become increasingly important.

## Links between Population and Climate Change

### *Population, Climate Change Vulnerability and 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.<sup>2</sup> 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.<sup>3</sup> 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.<sup>4</sup>

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.<sup>5,6,7</sup> 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.<sup>8</sup>

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.<sup>9</sup> 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,<sup>10</sup> 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.<sup>11</sup>

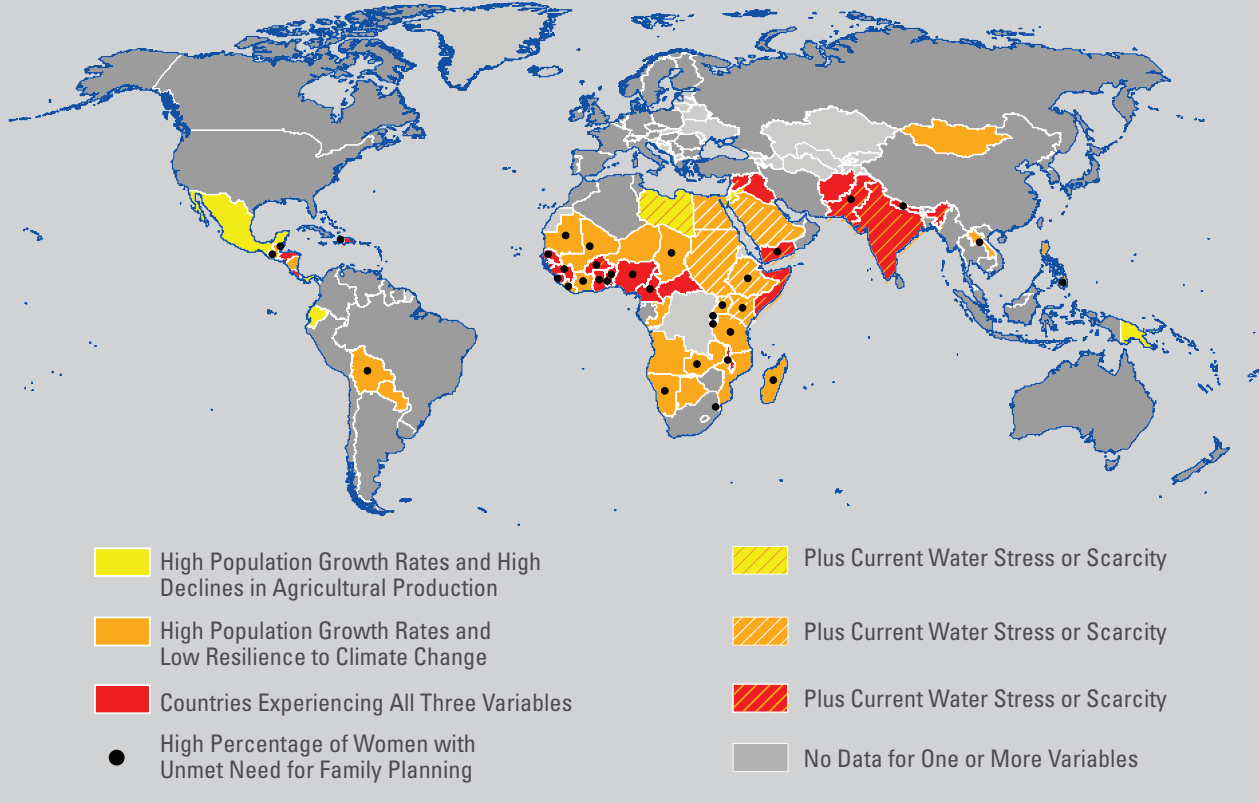
Though everyone will be affected by climate change impacts, in many places, women will suffer the most. Physical and cultural factors contribute to women's disproportionate vulnerability to the impacts of climate change.<sup>12</sup> In many societies, as the primary providers of water, food, and fuel, 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.<sup>13</sup>

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).<sup>14</sup> Nine of these countries are already experiencing water stress or scarcity.

In hotspot countries, an average of one in four married women would like to avoid pregnancy, but is 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.<sup>15</sup>

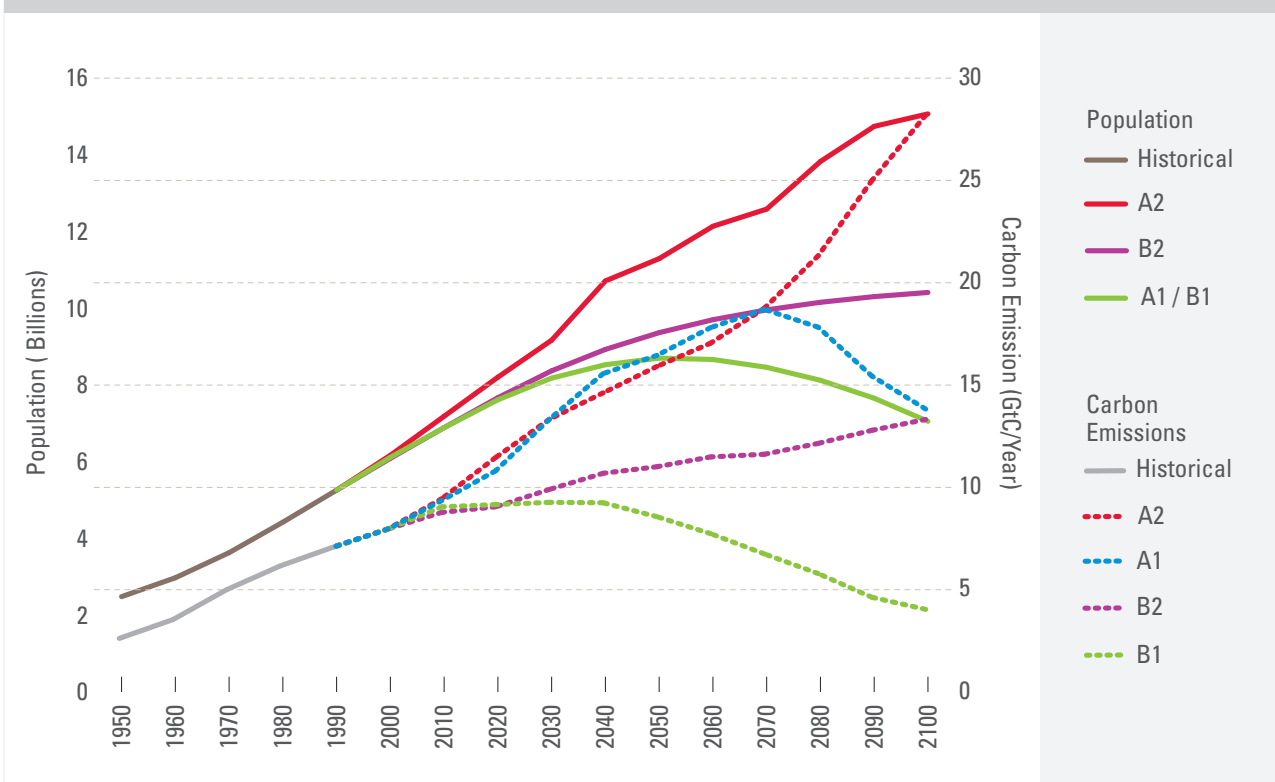
**FIGURE 1: Population and Climate Change Hotspots**

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.

**FIGURE 2: Population Changes and Carbon Emissions Under IPCC SRES Scenarios**



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

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.<sup>16</sup> 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.<sup>17</sup>

**Population and greenhouse gas emissions**

Demographic variables also influence the factors driving climate change impacts. In future climate scenarios generated by the Intergovernmental Panel on Climate Change (IPCC), higher population growth projections generally result in more greenhouse gas 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 world population projection of 7.1 billion to a high of 15 billion in 2100. The climate change models driven by these scenarios indicate that higher population growth in the future is associated with more emissions (see Figure 2), with a few exceptions. For example, the effects of highly carbon-intensive economic growth and technological change can result in high emissions, even in scenarios of low population growth.<sup>18</sup>

New research examines the effect of different population futures on economic growth and energy use, and indicates that slower population growth has the potential to significantly reduce future greenhouse gas emissions. Following a slower population growth path could reduce emissions from fossil fuel use by 1.4 to 2.5 billion tons of carbon per year by 2050.<sup>19</sup> This is roughly 16 to 29



percent of the emissions reductions needed to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent the most damaging climate change.<sup>20</sup> About half of those reductions would come from fertility decline in the United States and developing countries (not including China), and could be achieved through meeting existing demand for family planning services in those countries.<sup>21</sup> The emissions reductions that could be expected

