WHY POPULATION MATTERS

Population Action
INTERNATIONAL
HEALTHY FAMILIES HEALTHY PLANET

WHY POPULATION MATTERS

Acknowledgments
The following PAI staff contributed to this publication: Shelly Amieva, Yonas Asfaw, Kristine Berzins, Amandi Clarke, Suzanna Dennis, Roger-Mark De Souza, Allie Doody, Elisha Dunn-Georgiou, Suzanne Ehlers, Karen Hardee, Roberto Hinojosa, Caitlin Horrigan, Michael Khoo, Erika Larson, Craig Lasher, Elizabeth Leahy Madsen, Cassie Mann, Kathleen Mogelgaard, Clive Mutunga, Gina Rumbolo, Mary Panke, Wendy Turnbull, and Danielle Zielinski.

Photos courtesy of Nathan Golon and Kathleen Mogelgaard.

Any questions about this publication may be directed to **pai@popact.org.**

Population Action
INTERNATIONAL
HEALTHY FAMILIES HEALTHY PLANET

Population Action International advocates for women and families to have access to contraception in order to improve their health, reduce poverty and protect their environment.

1300 19th Street, NW | Second Floor | Washington, DC 20036 USA
Tel: +202.557.3400 | Fax: +202.728.4177 | wwww.populationaction.org | Email: pai@popact.org

TABLE OF CONTENTS

FOREWORD

If you haven't heard by now, the world added its 7 billionth person on Oct. 31, 2011. A few months before this milestone, PAI took to the streets of Washington, DC, to find out what people thought about our growing population. Their reactions to 7 billion speak for themselves:

"Wow"

"That's a lot."

"I'm surprised it's gone up quite that fast."

"More people will need more energy, more food."

"Do we have enough funding for that?"

"It's definitely going to affect each individual."

While people were understandably awed by the numbers, their answers also revealed concern about how those numbers impact their—and all of our—lives. It's a balance PAI has always tried to strike, between big picture demographics and the needs and rights of individuals. In other words, numbers matter, but people count.

When we undertook the first edition of *Why Population Matters* in 1996, we saw an opportunity to open a conversation with population devotees, to help them unpack their numbers game and see a woman's face at the center of it all. We also, importantly, saw an opportunity to talk to women's rights advocates, who were suspicious of quantitative analyses that could lead to quota-based systems.

In the 60s and 70s, when the population issue was gaining prominence, the concern was largely if not exclusively about numbers. Some devastating experiments were the outcome—coercion, sterilization, and blatant disregard for human rights. The "overpopulation" crusade suggested, however implicitly, that some people are superfluous, which PAI finds morally unacceptable.

In 1994, at the International Conference on Population and Development in Cairo, the world came around to a different way of thinking—framed fully within a rights-based context. But really, who lives their life by a UN mandate? The real benefits of that framework were conferred on women who had no knowledge of it. It showed up in small ways—in empowerment, in the way they lived their lives. In the way I live my life.

Fast forward to where we are now, facing renewed attacks in as hostile a climate as any of us can remember. Politically, there are relentless attacks on women's rights and health. Economically, we are witnessing deep and irrevocable cuts to spending and foreign aid. Even the religious and cultural corner is waging newly energized attacks on contraception, though Catholics, for example, admit—in poll after poll—to using it widely.

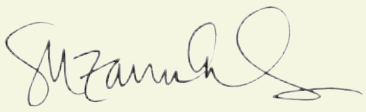
Attacks on reproductive health may seem small in the face of the economic and political crises of the day, but we must remember that it is small acts that contribute to the big, sweeping changes. Something as simple as having the status to make your own decisions about children—being able to get birth control at a nearby clinic—may not seem like a big event. But multiply that by billions of women the world over, and it is the foundation of a constant push to make the world more equal, better educated, more sustainable, more safe.

Any way you slice it, it comes down to women being valued and having the freedom to make good choices for themselves and their families. When they can't, numbers problems ensue. This is true in high-fertility countries, where high birth rates create high maternal deaths and growing demands for resources and infrastructure. It's equally true in low-fertility countries (or aging communities), where women are refraining from having children because society doesn't offer a way to balance motherhood and their career. Tragically, this latter piece of the equation still plays out in dangerous ways, such as "missing girls" resulting from China's one-child policy. The policy itself is troubling, but its effects also point to a broader societal challenge that women are not valued.

We have plenty to celebrate, of course. Look how far we've come in the US—just a few generations ago, child survival was not ensured. And looking ahead, much depends on the choices we make now. Family planning is far from a silver bullet, but on so many issues, it's a critical part of the solution. And it's what women are asking for as they deal with challenges from poverty to climate change to political instability.

Time and time again, in country after country, history has shown that if you give women the tools to have control over their lives, the numbers will follow. They solve the "population problem" on their own. No need for laws, no force necessary. Make them healthy, make births safer, ensure their kids will live, give them access to contraception, and women opt for smaller families.

As 7 billion passes, it's easy to get caught up in numbers. But the only reason those numbers mean anything is because of the individual lives behind them. In order to make the most of this moment and all those to follow, we need to lead every conversation about numbers with rights.



Suzanne Ehlers, *President & CEO*

WHY POPULATION MATTERS IN **TODAY'S WORLD**

Population impacts many aspects of our lives, including issues as diverse as poverty, health, education, water, and forests. Population matters even more today because historically high numbers of people are intensifying these impacts on our well-being at a time when the demographic picture of the world is becoming increasingly complex.

The global demographic trajectory for decades has been one of rapid growth. As a result, world population reached 7 billion in October 2011. At the same time, people are living longer. Rates of international migration are increasing. More people are moving to cities.[1] More than half of the world's population is under age 30, and a quarter is younger than 15.[2] Growth in some wealthy and high-consuming countries has slowed, while it continues unabated in many less-developed countries that consume less.

Economic, environmental and political factors are influencing the way global population is changing. The decisions we make today will help determine whether our numbers grow to anywhere between 8 billion and 11 billion by mid-century. Will fertility rates remain high in the developing countries where millions of women can't access contraception, or will they move towards a replacement level of two children per couple as reproductive health programs expand?

But before exploring questions such as these, it is important to understand what factors shape population itself.

How we got here

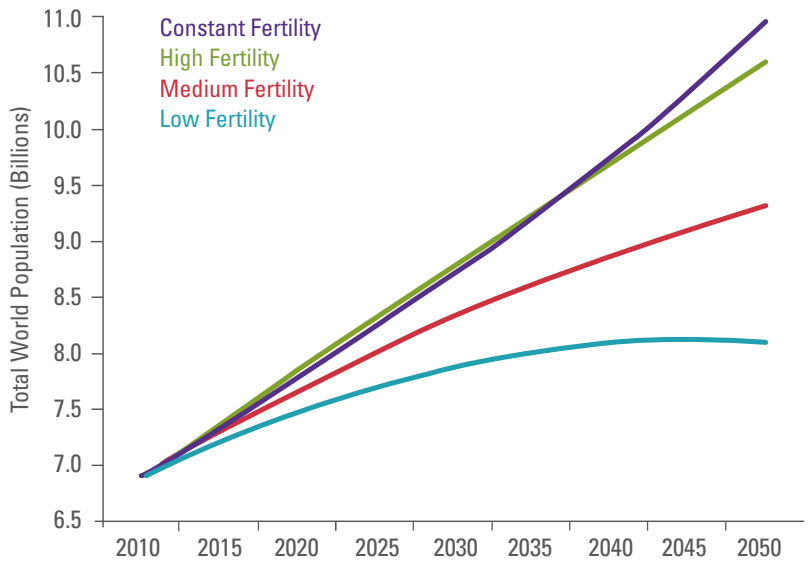
It took until 1804 for the world's population to reach 1 billion, and a century longer to hit 2 billion. However the pace of growth became much faster through the 20th century as mortality rates declined while fertility, in most places, remained high. Total population doubled from 3 billion in 1959 to 6 billion in 1999. The seventh billion was reached in late 2011.[3] Although the global population growth rate has slowed, the number of people on the planet still increases by 78 million each year.

Population changes are driven by three factors: fertility, mortality, and migration. The most influential of these is the total fertility rate, or the average number of children born to each woman.

Historically, fertility rates have varied across the world. For example, from 1990 to 1995, the fertility rate for Sub-Saharan Africa was 6.05 children per woman—almost three times the North American rate of 1.96. Today, although the rates for both regions have declined, the rate for Sub-Saharan Africa is still significantly higher at 4.78—more than twice the North American rate of 2.04. Worldwide, the current global fertility rate for 2010 to 2015 is 2.5 children per woman, a decline from 3.59 in 1980 to 1985.[4]

As is seen in Figure 1, the United Nations projects scenarios based on possible trends in fertility. These projections assume continuing declines in most fertility rates towards the global average. However, all countries do not follow the same development pathway and many countries may never experience such declines.

FIGURE 1: World Population Has Many Possible Paths



Source: United Nations Population Division. 2011. *World Population Prospects: The 2010 Revision.* New York: UN Population Division.

When fertility does not actually decline, population projections may become inaccurate, as was recently the case with Kenya. Between 1998 and 2003, Kenya's total fertility rate rose slightly from 4.7 to 4.8 children per woman.[5] Because the UN had assumed a declining fertility rate during that period, the projection of Kenya's total population in 2050 had to be revised, and nearly doubled from 44 to 83 million.[6]

Fertility rates have remained high, and today, Kenya is projected to have an even larger population of almost 100 million by mid-century.[7] These changing projections illustrate how the impact of demographic trends is compounded over generations, and is manifested in future population momentum. Such momentum, built upon previous generations of high fertility, is the reason that the world's population is projected to grow to more than 9 billion by 2050, even as the average number of children per woman is projected to decline to just over two during the same period.

More than half of the world's people live in countries where fertility rates are above the rate necessary for each couple to have only enough children to replace themselves. This replacement level fertility is a rate of about two children per couple. Reproduction at this rate alone would ensure sustained population growth for the long term. Nearly 1 billion people live in countries where women have an average of four or more children, a rate that would result in their population doubling every 35 years. The vast majority of population growth is occurring in the developing world. If current fertility rates held constant, the total population of the world's 49 least developed countries would surpass that of the more developed regions by 2030.[8]

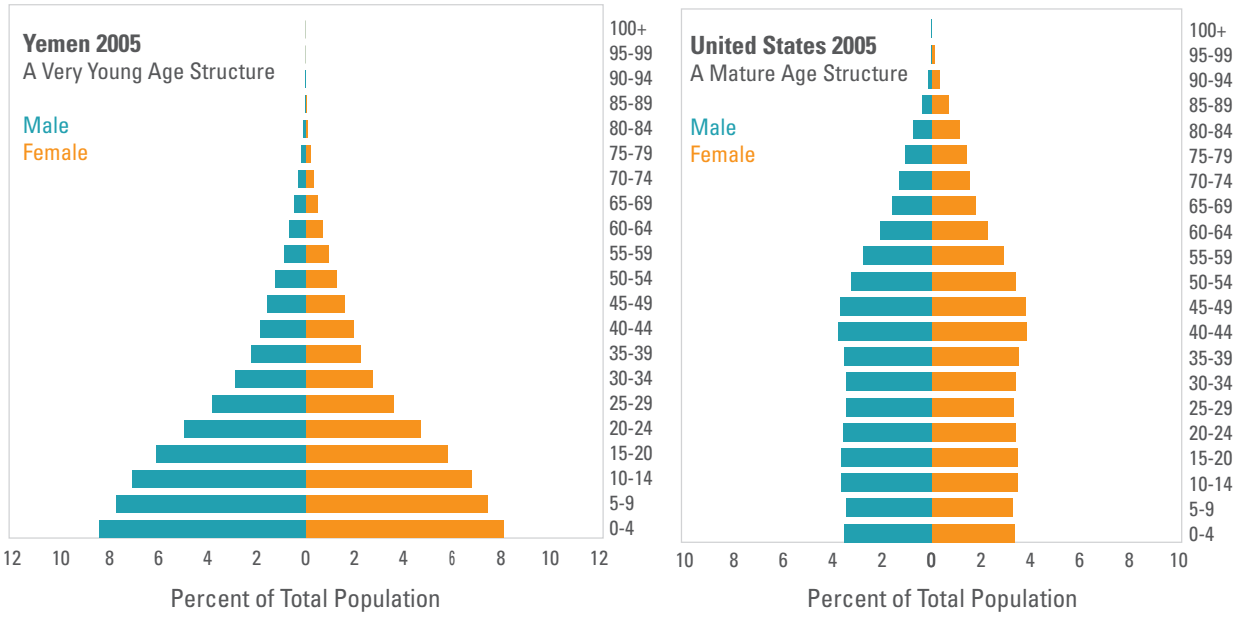
Of the more than 200 million pregnancies worldwide each year, approximately 40 percent are unintended.[9] This refers to any pregnancy that occurs when a woman wanted to postpone pregnancy for at least two years or did not want to become pregnant at all. The rate of unintended pregnancies has fallen in all regions worldwide except North America, where almost half are unplanned. Rates of unintended pregnancy have declined in regions where contraceptive use has increased.[10]

The Demographic Transition

Many countries' populations go through what is called the "demographic transition," a shift from high fertility and mortality rates to lower mortality, followed by declining fertility and a stable or even shrinking population (see Figure 2). In the early stages, when mortality has declined but fertility remains high, populations grow rapidly. As fertility rates decline and populations reach the middle of the transition period, growth continues due to demographic momentum. At the end of the demographic transition, populations are characterized by longer life expectancies and smaller family sizes.

During the 20th century, the pace of the demographic transition became faster due to technological advances

FIGURE 2: Population Age Structures Along the Demographic Transition



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

in health, though it still typically takes decades to complete. Some countries, such as Iran, have moved through the transition much faster thanks to relatively strong health systems and investments in family planning and in the well-being of its population. When populations are educated, economies stablize and labor markets flourish. This middle phase of the demographic transition can offer an opportunity for significant economic growth, known as the demographic dividend. This happened in East Asia, particularly in China, Korea, Hong Kong, and Japan.[11] However, countries where fertility rates remain high are far from reaching these benefits.

Populations in much of Europe, Russia and parts of East Asia have recently entered a new phase at the end of the demographic transition characterized by fertility rates below replacement level, lower incidence and later age of marriage, and high life expectancies.[12] Falling fertility rates, which have occurred across most regions of the world and induced population aging, are a reflection of improved public health and other positive socioeconomic developments. There is little doubt that population aging will have significant economic and social consequences, but it is still a new phenomenon in human society.

Population decline, meanwhile, is still uncommon, as it only occurs when the annual number of deaths surpasses births and is not offset by immigration. Populations in 15 countries, nearly all in Eastern Europe as well as Germany and Japan, have already begun declining, but population decline is occurring on a much smaller scale than growth. While Eastern Europe would decline by 21 percent at mid-century at current rates, the fastest-growing regions, Central and Western Africa, would more than triple.[13]

Influences on Fertility Trends

In order for reductions in fertility rates to occur, various social changes and economic improvements are necessary. These include parents choosing to invest in their children's education rather than employ them to provide income.[14] Education for girls lowers their future fertility rates by 0.3 to 0.5 children for each additional year in school.[15] Smaller family sizes allow more children to be educated[16] and can promote girls' education.

Fertility patterns are also affected by contraceptive use. Family planning and reproductive health programs implemented over several decades helped fertility rates in many developing countries decline. In Southeast Asia and Latin America, average fertility rates declined from more than five children per woman in the early 1970s to more than two today. In North Africa, fertility dropped from 6.5 to three children per woman.[17] Nearly half of fertility declines achieved across the developing world between 1960 and 1990 can be attributed to family planning programs.[18] One study found that in 24 of 26 countries, at least 70 percent of the increase in contraceptive use was due to couples' pre-existing desire to use due to family planning rather than changing preferences related to family size.[19]

Many factors diminish contraceptive use. Reasons include a lack of access or having to travel at least 30 minutes to acquire contraception; not knowing a source of family planning; having few contraceptive methods to choose from; high prices; cultural expectations requiring the approval of a husband; and misinformation about side effects.[20] Research shows that in sub-Saharan Africa and South Asia, two regions where need for contraception is highest, opposition to family planning and concerns about side effects are the most common reasons that married women do not use contraception even if they do not wish to have more children.[21]

Improving Access to Family Planning Makes a Difference

Currently, 215 million women in developing countries would like to delay pregnancy but lack modern contraception. Meeting this demand would reduce the number of maternal deaths and unsafe abortions by at least 70 percent, and newborn deaths would decline by nearly half.[22]

Family planning improves maternal and child health. Pregnancies that occur too early, too late or too frequently can lead to illness during pregnancy and birth complications. Most countries with high malnutrition numbers also have high fertility rates.

Family planning helps reduce HIV/AIDS. Young people between the ages of 15 and 24 are at a higher risk of HIV infection.[23] The world's youth population is greater now than at any time in history. There is frequently overlap among countries with youthful populations, high rates of HIV prevalence and low access to family planning. Increased population densities and unhealthy living conditions in urban slums can ease the transmission of infections. Access to family planning services has the ability to reduce the spread of disease, especially when integrated with existing HIV prevention programs.

Family planning helps conserve natural resources. The demand for water, forests and land increases as the world's population grows. The most resource stressed areas are also typically those with fewer resources, high population densities, and high population growth rates. Millions are

displaced by natural disasters and recent studies show that urbanization is the most important driver of deforestation in the 21st century.[24] Much of global population growth expected to take place in the humid tropics whose ecosystems harbor the planet's richest forms of biodiversity. Policies that mitigate pressure by providing health services conserve biodiversity.

Family planning increases resilience to the negative impacts of climate change. Rapid population growth expands and exacerbates people's vulnerability to climate change impacts. Globally, there are 26 "hotspot" countries with low climate change resilience, rapid population growth and high projected declines in agricultural production.[25] Population growth, especially in wealthy developed countries, is one of the drivers of the growth in greenhouse gases that contribute to climate change.

Family planning helps reduce the potential for conflict. Over the past several decades, countries in which at least 60 percent of the population is younger than 30 have been more likely to experience outbreaks of conflict than countries with a more even age distribution.[26]

Family planning decreases poverty. Population has the potential to impact all aspects of poverty. Fertility trends can help a country determine when and how to invest in its population's education and job markets to jump-start economic development.

Family planning programs save lives and are cost-effective. They are also desired by women throughout the world. Ensuring that women have the number of children they want to have will help them and their families prosper, improving the well-being of their families and the planet.

Endnotes

1 International Organization for Migration. (IOM). 2010. *Facts & Figures*. IOM. http://www.iom.int/jahia/Jahia/about-migration/facts-and-figures/lang/en; Accessed 29 December 2010; United Nations Population Division. 2010. *World Urbanization Prospects: The 2009 Revision*. New York: UN Population Division.

2 UN Population Division. 2010.

3 United Nations Population Division. 2011. *World Population Prospects: The 2010 Revision*. New York: UN Population Division; United Nations Population Division. 1999. *The World at Six Billion*. New York: UN Population Division.

4 UN Population Division 2011.

5 Republic of Kenya Central Bureau of Statistics (CBS) and Macro International Inc. (MI). 1999. *Kenya Demographic and Health Survey 1999*. Calverton: CBS, and MI.; Central Bureau of Statistics (CBS) and ORC Macro. 2004. *Kenya Demographic Health and Health Survey 2003*. Calverton: CBS and ORC Macro.

6 United Nations Population Division. 2003. *World Population Prospects: The 2002 Revision*. New York: UN Population Division; United Nations Population Division. 2005. *World Population Prospects: The 2004 Revision*. New York: UN Population Division.

7 UN Population Division. 2011.

8 UN Population Division. 2011.

9 Singh, S, G Sedgh and R Hussain. 2010. "Unintended Pregnancy: Worldwide Levels, Trends, and Outcomes". *Studies in Family Planning 2010*. 41(4): 241-250.

10 Singh, Sedgh and Hussain 2010; Westoff, CF. 2005. "Recent Trends in Abortion and Contraception in 12 Countries." *DHS Analytical Studies* No.8. Calverton, MD: ORC Macro.

11 Bloom, DE, D Canning and J Sevilla. 2003. "The Demographic Dividend: A New Perspective on the Economic Consequences of Population Change." In Birdsall, N, AC Kelley and SW Sinding, eds. *Population Matters: Demographic Change, Economic Growth, and Poverty in the Developing World*. Oxford: Oxford University Press.

12 Lesthaeghe, R. 2010. "The Unfolding Story of the Second Demographic Transition." *Population and Development Review* 36(2): 211-251.

13 UN Population Division. 2011.

14 Caldwell, JC. 1976. "Toward a Restatement of Demographic Transition Theory." *Population and Development Review* 2(3/4): 321-366.

15 Abu-Ghaida, D and S Klasen. 2004. *The Economic and Human Development Costs of Missing the Millennium Development Goal on Gender Equity*. Washington, DC: World Bank.

16 C Lloyd. 2005. *Growing Up Global: The Changing Transitions to Adulthood in Developing Countries*. Washington, DC: National Academies Press

17 UN Population Division. 2011.

18 Bongaarts, J. 1997. "The Role of Family Planning Programmes in Contemporary Fertility Transitions." In Jones, GW, RM Douglas, JC Caldwell and RM D'Souza, eds. *The Continuing Demographic Transition*. Oxford: Clarendon Press.

19 Feyisetan, B and JB Casterline. 2000. "Fertility Preferences and Contraceptive Change in Developing Countries." *International Family Planning Perspectives* 26(3): 100-109.

20 Campbell, M, NN Sahin-Hodoglugil and M Potts. 2006. "Barriers to Fertility Regulation: A Review of the Literature." *Studies in Family Planning* 37(2): 87-98.

21 World Bank. 2010. *Unmet Need for Contraception at a Glance*. Washington, DC: World Bank.

22 Singh, S, JE Darroch, LS Ashford and M Vlassoff. 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.

23 U.S. Agency for International Development (USAID), Joint United Nations Programme on HIV/AIDS (UNAIDS), and FHI. 2010. *Young People Most At Risk of HIV: A Meeting Report and Discussion Paper*. Durham: FHI.

24 DeFries, R, T K Rudel, M Uriarte and M Hansen. 2010. "Deforestation Driven by Urban Population Growth and Agricultural Trade in the Twenty-First Century." *Nature Geoscience* 3: 178-181.

25 Population Action International. *Mapping Population and Climate Change*. PAI. http://www.populationaction.org/Publications/Data_and_Maps/Mapping_Population_and_Climate_Change/Summary.php

26 Leahy, E, R Englelman, C Vogel, S Haddock and T Preston. 2007. *The Shape of Things to Come*. Washington, DC: PAI.

GLOSSARY

ACRONYMS

CBD Convention on Biological Diversity

DHS Demographic Health Surveys

FAO Food and Agricultural Organization

GDP Gross Domestic Product

ILO International Labor Organization

IPPC Intergovernmental Panel on Climate Change

LDC Least Developed Countries

MDG Millennium Development Goals

MENA Middle East and North Africa

NAPA National Adaptation Programmes of Action

WHO World Health Organization

UNFPA United Nations Population Fund

UNICEF The United Nations Children's Fund

TERMS

Adaptation
Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effect, which moderates harm or exploits potential benefits. Adaptation can be carried out in response to or in anticipation of changes in climatic conditions.[1]

Age structure
The comparative size of specific age groups relative to others or to the population as a whole[2]

Biodiversity
The range of genetic differences, species differences, and ecosystem differences in a given area[3]

Climate change
Refers to any significant change in measures of climate (such as temperature, precipitation or wind) lasting for an extended period (decades or longer).[4]

Child mortality rate
Number of deaths under age 5 over a given period

Death rate
The number of deaths per 1,000 people in a given year[5]

Deforestation
Clearing of tree formations and their replacement by non-forest land uses[6]

Demographic dividend
A defined period of time during the process of the demographic transition in which the working-age adults make up the largest share of the population, with relatively small groups of dependent children and older adults compared to previous generations. The demographic dividend is also referred to as the "demographic bonus."[7]

Demographic transition
The historical shift of birth and death rates from high to low levels in a population. The decline of mortality usually precedes the decline in fertility, thus resulting in rapid population growth during that period.[8]

Family planning
The conscious effort of couples to regulate the number and spacing of births through artificial and natural methods of contraception.[9]

Fertility variant
The United Nations provides country-specific estimates of population growth based on projections of fertility derived from past trends and future life expectancy. The three fertility variants of the United Nations projects are referred to as high, medium and low, depending on the assumed level of fertility.[10]

Food security
When all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food which meets their dietary needs and food preferences for an active and healthy life[11]

Greenhouse gases
Carbon dioxide, nitrous oxide, methane, ozone, and chloro-fluorocarbons occurring naturally and resulting from human (production and consumption) activities, and contributing to the greenhouse effect (global warming).[12]

HIV incidence rate
The number of new HIV infections in a population during a certain time period.

HIV prevalence rate
Percent of people infected with HIV among all people in a given population.

Maternal morbidity
The frequency of disease, illness, injuries, and disabilities due to childbirth and/or pregnancy.

Maternal mortality
Number of deaths due to maternal causes per 100,000 live births during a given year[13]

Mature age structure
Classification for countries where fertility rates reach two children per woman or below, and 45 percent or less of the population is younger than age 30 and up to 25 percent of the population is younger than age 60.

Mitigation
Actions to reduce emissions stemming from the burning of burning of fossil fuels and the loss of forests.

Modern contraception
Includes all hormonal methods, IUDs, male and female sterilization, condoms, and modern vaginal methods (e.g., the diaphragm and spermicides)[14]

Population density
Population per square kilometer of land area.[15]

Remittances
Monies earned or acquired by non-nationals that are transferred back to their country of origin[16]

Replacement level fertility rate
The level of fertility at which a couple has only enough children to replace themselves, or about two children per couple.[17]

Total fertility rate
Total fertility rate represents the number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with current age-specific fertility rates[18]

Transitional age structure
Classification for countries where fertility rates have been in sustained decline and 45 to 60 percent of the population is younger than age 30.[19]

Urbanization
Increase in the proportion of a population living in urban area[20]

Unmet need for family planning
The proportion of currently married women who do not want any more children, but are not using any form of family planning. Or applies to married women who want to postpone their next birth for two years, but are not using any form of family planning[21]

Unintended pregnancies
A pregnancy that occurs when a woman wanted to postpone conception for at least two years or did not want to become pregnant at all.[22]

Very young age structure
Classification for countries with high fertility rates and a population where 66 percent or more of the total population is younger than age 30[23]

Youthful age structure
Classification for countries where fertility rates have begun to decline but are still fairly high creating a population where 60 to 67 percent of the population is younger than age 30[24]

Water-scarce
Classification for countries with fewer than 1,000 cubic meters of renewable freshwater available per person per year[25]

Water-stressed
Classification for countries with between 1,000 and 1,667 cubic meters of renewable freshwater available per person per year.[26]

Endnotes

1 Intergovermental Panel on Climate Change. 2007. "Glossary." *IPCC Fourth Assessment Report: Climate Change*. Cambridge, UK: IPCC.
2 Leahy, E, R Englelman, C Vogel, S Haddock and T Preston. 2007. *The Shape of Things to Come*. Washington, DC: PAI.
3 United Nations Statistics Division. 2011. "Glossary." *UN Data*. http://data.un.org/Default.aspx
4 United States Enviromental Protection Agency. "Glossary of Climate Change Terms." http://www.epa.gov/climatechange/glossary.html#EnhancedGHG
5 Population Reference Bureau (PRB). 2004. *Population Handbook 5th Edition*. Washington, DC: PRB.
6 United Nations Statistics Division. 2011.
7 PAI. 2007.
8 Population Reference Bureau. 2004.
9 Population Reference Bureau. 2004.
10 World Food Programme. 2011. "Glossary." *WFP Publications*. http://www.wfp.org/about/evaluation/methods-and-tools/glossary#f-en
11 United Nations Statistics Division. 2011.
12 United Nations Statistics Division. 2011.
13 Guttmacher Institute and United Nations Population Fund. 2009. *Adding It Up: The Costs and Benefits of Investing in Family Planning and Maternal and Newborn Health*. New York: Guttmacher Institute and UNFPA.
14 United Nations Statistics Division. 2011.
15 International Organization for Migration (IOM). 2004. *International Migration Law – Glossary on Migration*. Geneva: IOM.
16 Population Reference Bureau. 2004.
17 United Nations Population Division. 1996. "Future Expectation for Below-Replacement Level Fertility." http://www.un.org/esa/population/pubsarchive/belowrep/belowrep.htm
18 World Bank. 2011. World Development Indicators. http://data.worldbank.org/indicator/all.
19 PAI. 2007.
20 United Nations Statistics Division. 2011.
21 World Bank. 2011.
22 Guttmacher Institute and United Nations Population Fund. 2009.
23 PAI. 2007.
24 PAI. 2007.
25 Falkenmark, M and C Widstrand. 1992. "Population and Water Resources: a Delicate Balance." *Population Bulletin* (47.3): 1-36.
26 Falkenmark and Widstrand. 1992.

WHY POPULATION MATTERS TO
MATERNAL HEALTH

WHY POPULATION MATTERS TO **MATERNAL HEALTH**

Unintended pregnancies are an important cause of maternal deaths. Pregnancies that occur too early, too late or too frequently can lead to illness during pregnancy and complications at the time of birth. Lowering fertility rates by increasing the use of family planning helps to reduce pregnancy-related deaths and population growth. In many countries with high maternal mortality, fertility rates would be lower if women had the number of children they desire.

The State of Maternal Health

Maternal mortality is a top cause of death among women of reproductive age in developing countries. Approximately 350,000 women die each year due to pregnancy-related causes, despite recent improvements and international commitments to reducing maternal mortality.[1] Women under the age of 18 and above 35 are more likely to die in pregnancy or childbirth, due to physical under-development for young women and a higher risk of complications among older women.[2]

The risk of maternal deaths is not equal across regions (Figure 1). One out of 120 women in developing countries will die from pregnancy-related complications during her lifetime, compared to one in 4,300 women in developed countries.[3] For women in Afghanistan, the risk is one in 11—the highest in the world. For those in sub-Saharan Africa, it is one in 31. Mortality is not the only consequence of poor maternal health care. Morbidity, which includes diseases and illnesses, has an even wider impact, with at least 20 cases of complications and disabilities experienced for each maternal death.[4]

The direct causes of maternal mortality and morbidity include hemorrhage, hypertensive disorders such as eclampsia, unsafe abortion, infections such as sepsis, and obstructed labor.[6] These are generally preventable and treatable with basic supplies and inexpensive medicines, such as oxytocin to prevent hemorrhage and antibiotics to address infection. But significant barriers to improving maternal health remain, such as a shortage of trained health care providers and weak transportation networks that connect patients to services. Cultural barriers include gender inequities and socio-cultural traditions that limit women's decision-making power.

In recent decades, increasing contraceptive use has helped reduce maternal mortality in many countries.[7] A woman's risk of dying from pregnancy-related causes is directly linked to the average number of children she has during her lifetime.[8] In an area in Bangladesh, for example, 30 percent of the reduction in maternal mortality achieved between 1979 and

2005 is attributable to a decrease in the average number of children per mother, falling from nearly five to fewer than three children per woman.[9] Sub-Saharan Africa, which has the highest rate of maternal mortality and lowest rate of contraceptive use among all regions, also has the highest rate of unintended pregnancy.[10] Unintended pregnancies are dangerous for both mother and baby. If all women in developing countries who wish to prevent pregnancy were using contraceptives and maternal and newborn health care was fully available, 250,000 maternal deaths and 1.7 million newborn deaths would be prevented each year.[11]

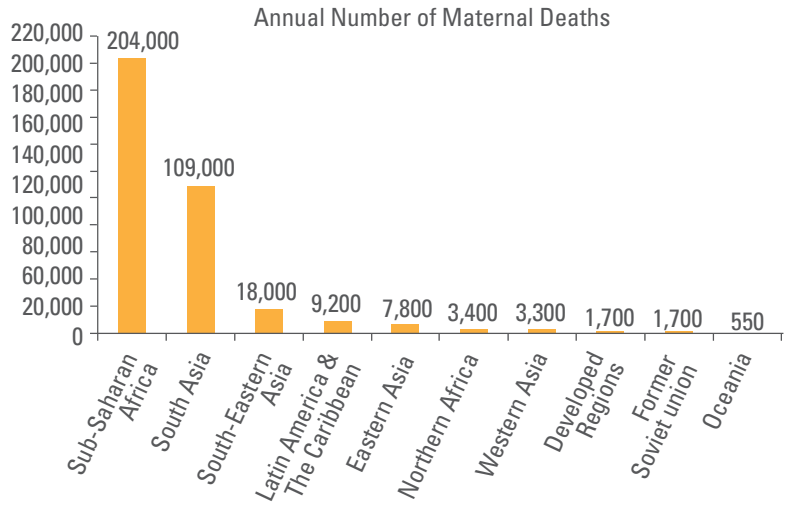
Links between Population and Maternal Health

Unintended pregnancies affect both demographic trends and people's health and well-being. Forty percent of all pregnancies in developing countries are unintended.[12] When these pregnancies result in births, they contribute to higher fertility rates and population growth. High rates of unintended pregnancy can diminish overall well-being when levels of maternal morbidity increase.

Countries with the highest rates of maternal mortality in their regions also tend to have high fertility rates (Figure 2). The number of pregnancy-related deaths and the overall risk of maternal mortality would decline if fertility decreased among adolescents and young women.[13] To decrease an individual woman's risk of maternal mortality, other improvements, such as increased access to skilled birth attendants and emergency obstetric care, are needed.

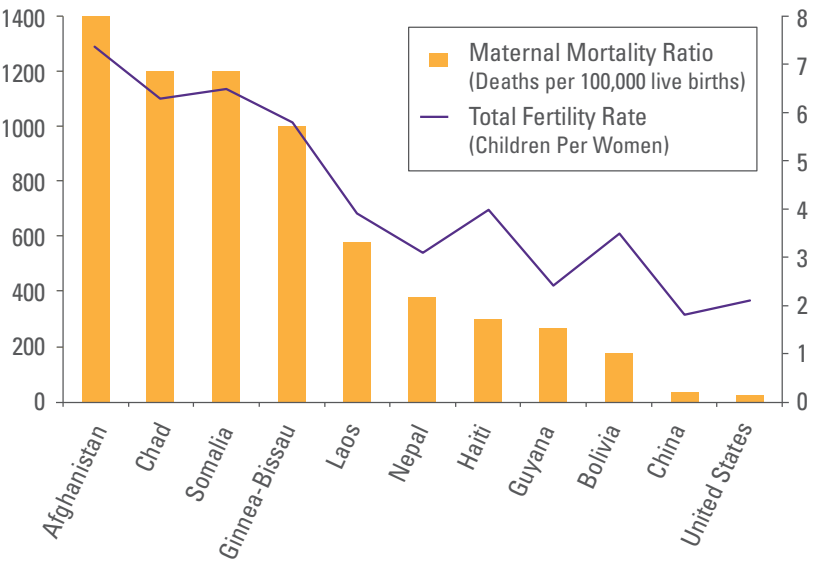
About half of unintended pregnancies in developing countries result in abortion, and unsafe abortion is a leading cause of maternal death.[14] Use of contraception could reduce the share of maternal mortality caused by unsafe abortion by up to 15 percent.[15]

FIGURE 1: Globally, Maternal Mortality is Highest in sub-Saharan Africa and South Asia



Sources: World Health Organization (WHO), World Bank, United Nations Children's Fund (UNICEF) and United Nations Population Fund (UNFPA). 2010. *Trends in Maternal Mortality: 1990 to 2008*. Geneva: WHO.

FIGURE 2: Countries with High Maternal Mortality also Have High Fertility Rates



Sources: World Health Organization (WHO), World Bank, United Nations Children's Fund (UNICEF) and United Nations Population Fund (UNFPA). 2010. *Trends in Maternal Mortality: 1990 to 2008*. Geneva: WHO; MEASURE Demographic and Health Surveys.

Country in Focus: Maternal Health, Fertility and Unintended Pregnancies in Kenya

Many countries with the highest rates of maternal mortality are also challenged by high rates of unintended pregnancy and a large need for family planning. These factors generate a cycle in which high fertility, due in part to unintended pregnancies, contributes to poor maternal health.

Kenya has an estimated maternal mortality ratio of 530 deaths per 100,000 live births, slightly lower than

the average of 640 for sub-Saharan Africa. Each year, an estimated 7,900 Kenyan women die during or after pregnancy.[17] More than half of births occur at home, primarily because of distance from and lack of transportation to health facilities, as well as concerns about cost and beliefs that facility deliveries are unnecessary.[18] Abortion is a major contributor to maternal mortality in Kenya: One study estimates that one-third of pregnancy-related deaths there are a consequence of abortion, which is illegal in most cases and typically unsafe.[19]

On average, a Kenyan woman has 4.6 children during her lifetime. If women could prevent unintended pregnancies and have the number of children they desire, this rate would decrease to 3.4 children per woman. According to household surveys, nearly one-fifth of births are unintended, and an additional 26 percent are mistimed. Twenty-six percent of married women want to prevent pregnancy, but lack modern contraception.[20]

If Kenya's fertility rate remains unchanged, the population of women of reproductive age will grow from 10 million in 2010 to 15 million in 2025.[21] Clinics and hospitals are already too few and far between to meet existing needs, and its system will have to expand rapidly to serve a growing population.

Policy Considerations

The United Nations Millennium Development Goal (MDG) 5 aims to reduce the maternal mortality ratio by 75 percent between 1990 and 2015 and achieve universal access to reproductive health. At the 2010 U.N. MDG summit, $40 billion was pledged to improve reproductive, maternal and child health over five years, with the goal of preventing 33 million unintended pregnancies and 740,000 maternal deaths. The U.N. Secretary-General also released the Global Strategy for Women's and Children's Health. These commitments represent increased political will, and recognition that progress toward improving maternal health has advanced much more slowly than many other development goals.

Between 1990 and 2008, the number of maternal deaths declined by one-third globally, but only 14 developing countries are on track to achieve the maternal mortality target of MDG 5.[22] Eight countries with already high rates of maternal death have seen maternal mortality increase since 1990.[23]

Maternal health is the cornerstone to achieving other MDGs. Children who lose their mothers in pregnancy or childbirth are more likely to die themselves (MDG 4).[24] The premature death of mothers and their children causes billions of dollars in lost productivity to the global economy annually (MDG 1), while good health and lower fertility rates improve the likelihood of women entering the workforce (MDG 3) and educating their children (MDG 2).[25]

The U.S. and other donors should work with developing country governments and non-governmental partners to meet the demand for family planning. Family planning has the dual benefit of saving women's lives by empowering them to delay and space their pregnancies and slowing population growth by lowering fertility rates. The prevention of unintended pregnancy through reproductive health care is necessary to ensure women have healthy pregnancies and safe deliveries.

Endnotes

1 World Health Organization (WHO), World Bank, United Nations Children's Fund (UNICEF) and United Nations Population Fund (UNFPA). 2010. Trends in Maternal Mortality: 1990 to 2008. Geneva: WHO; Hogan, M C, K J Foreman, M Naghavi, S Y Ahn, M Wang, S M Makela, A D Lopez, R Lozano and C J L Murray. 2010. "Maternal Mortality for 181 Countries, 1980-2008: A Systematic Analysis of Progress Towards Millennium Development Goal 5." *The Lancet* 375: 1609-1623.

2 Marston, C and J Cleland. 2004. *The Effects of Contraception on Obstetric Outcomes*. Geneva: World Health Organization.

3 WHO. 2010.

4 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).

5 "Former Soviet Union" includes Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan and Uzbekistan.

6 Khan, K S, D Wojdyla, L Say, A Metin Gülmezoglu and P F A Van Look. 2006. "WHO Analysis of Causes of Maternal Death: A Systematic Review." The Lancet 367: 1066-1074.

7 WHO. 2010.

8 Hogan, Foreman, Naghavi, Ahn, Wang, Makela, Lopez, Lozano and Murray 2010.

9 Chowdhury, M E, A Ahmed, N Kalim and M Koblinsky. 2009. "Causes of Maternal Mortality Decline in Matlab, Bangladesh." Journal of Health, Population and Nutrition 27(2): 108-123.

10 WHO. 2010; Singh, Darroch, Ashford and Vlasoff. 2009.

11 Guttmacher Institute. 2010. "Facts on Investing in Family Planning and Maternal and Newborn Health." New York: Guttmacher Institute.

12 Guttmacher Institute and UNFPA. 2010.

13 Marston and Cleland. 2004.

14 Singh, S, D Wulf, R Hussain, A Bankole and G Sedgh. 2009. *Abortion Worldwide: A Decade of Uneven Process*. New York: Guttmacher Institute.

15 Tsui, A O, R McDonald-Mosley and A E Burke. 2010. "Family Planning and the Burden of Unintended Pregnancies." Epidemiologic Reviews 32:152-174.

16 MEASURE Demographic and Health Surveys. Most recent year available. http://www.measuredhs.com/start.cfm. Accessed 5 November 2010; United Nations Population Division 2010. "2010 Update for the MDGs Database: Unmet Need for Family Planning." http://www.un.org/esa/population/unpop.htm. Accessed 5 November 2010. Countries selected are the three with highest MMRs in three regions (Africa, Asia, Latin America/Caribbean), plus China and the United States.

17 WHO. 2010.

18 Kenya National Bureau of Statistics and ICF Macro. 2010. *Kenya Demographic and Health Survey 2008-09*. Calverton: Kenya National Bureau of Statistics and ICF Macro.

19 Center for Reproductive Rights. 2010. *In Harm's Way: The Impact of Kenya's Restrictive Abortion Law*. New York: Center for Reproductive Rights.

20 Kenya National Bureau of Statistics and ICF Macro. 2010.

21 United Nations Population Division. 2009. *World Population Prospects: The 2008 Revision*. New York: UN Population Division.

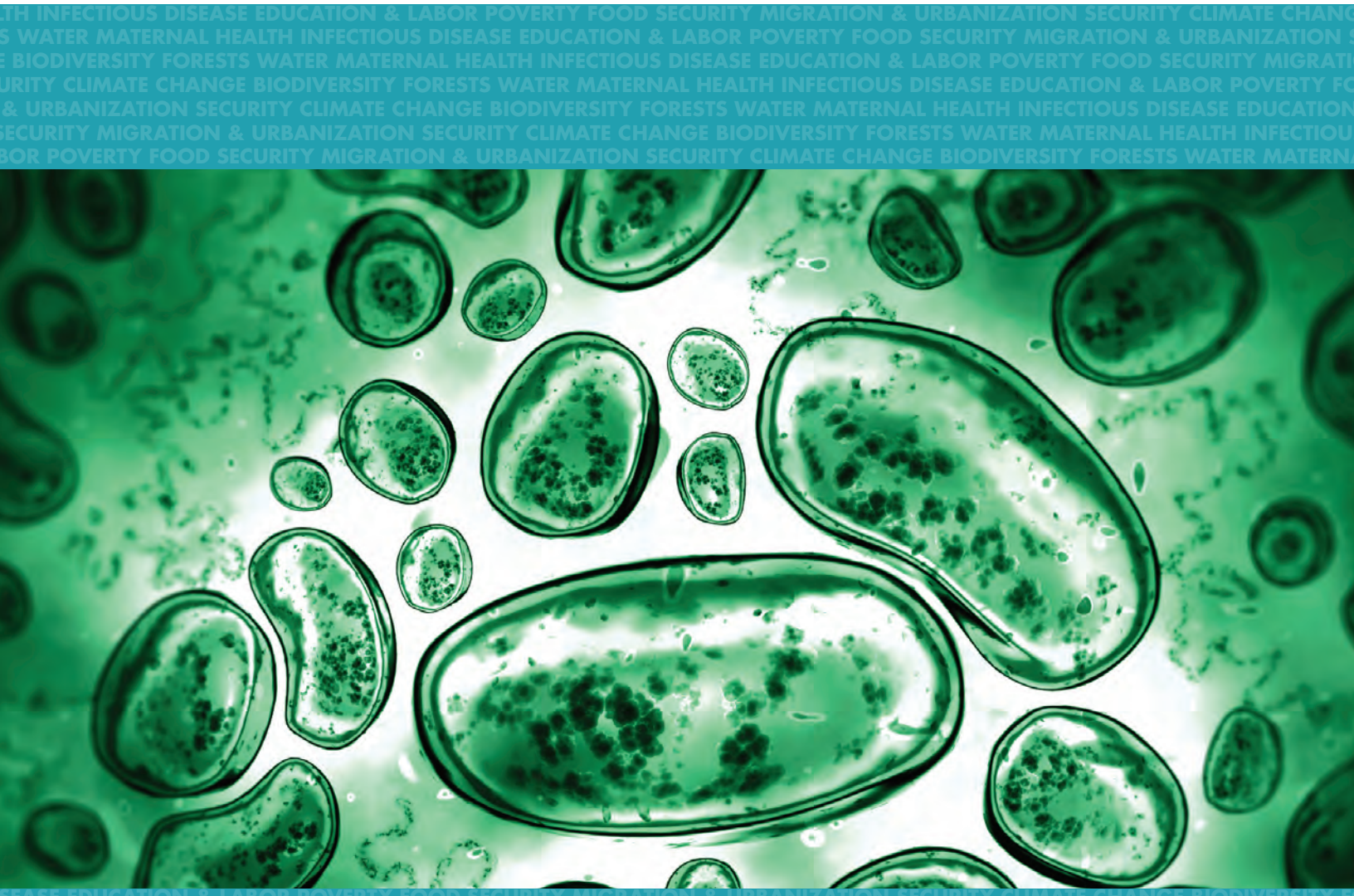
22 WHO, World Bank, UNICEF and UNFPA 2010. The 14 countries are Bhutan, Bolivia, China, Egypt, Equatorial Guinea, Eritrea, Estonia, Iran, Latvia, Maldives, Poland, Romania, Turkey and Vietnam.

23 WHO. 2010. These countries are Congo (Republic), Kenya, Lesotho, Somalia, South Africa, Swaziland, Zambia and Zimbabwe.

24 United Nations Children's Fund (UNICEF). 2008. *The State of the World's Children 2009: Maternal and Newborn Health*. New York: UNICEF; Katz, J, K P West Jr, S K Khatry, P Christian, S C LeClerq, E Kimbrough Pradhan and S Ram Shrestha. 2003. "Risk Factors for Early Infant Mortality in Sarlahi District, Nepal." Bulletin of the World Health Organization 81:717-725.

25 United Nations Secretary-General. 2010. *Global Strategy for Women's and Children's Health*. New York: United Nations; Greene, M E and T Merrick. 2005. *Poverty Reduction: Does Reproductive Health Matter?* Washington, DC: World Bank.

WHY POPULATION MATTERS TO INFECTIOUS DISEASES AND HIV/AIDS



WHY POPULATION MATTERS TO **INFECTIOUS DISEASES AND HIV/AIDS**

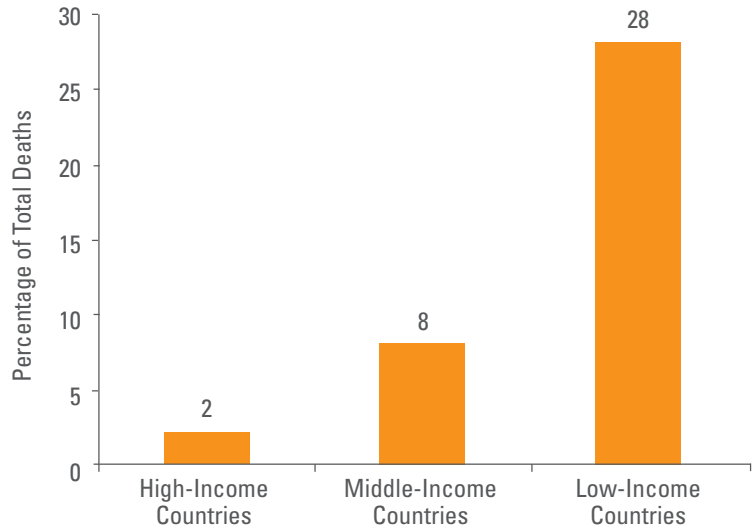
Fertility, migration and urbanization affect the spread of diseases including tuberculosis, malaria and HIV/AIDS. Increased population densities and unhealthy living conditions in urban slums can ease the transmission of infections. Migration may also increase vulnerability to disease.

Infectious diseases such as HIV/AIDS have had a large impact on demographic trends, altering the age structures of heavily affected countries.[1] Access to family planning services has the ability to reduce the spread of disease, especially when integrated with existing HIV prevention programs.

The State of Infectious Diseases and HIV/AIDS

In 2004, about one-fifth of all global deaths were a result of infectious and parasitic diseases, according to the World Health Organization.[2] Diseases previously controlled through public health measures are also increasing in frequency. These include tuberculosis, malaria, dengue fever and cholera. New diseases have also emerged within the last century, such as HIV/AIDS, Severe Acute Respiratory Syndrome (SARS), Lyme disease and West Nile fever.[3] Developing countries are the most affected. The rate of death from infectious and parasitic diseases is almost 14 times higher in low-income countries than in high-income countries (Figure 1).[4]

FIGURE 1: Deaths from Infectious and Parasitic Diseases are High in Low-Income Countries



Source: World Health Organization (WHO). 2008. *The Global Burden of Disease: 2004 Update.* Geneva: WHO.

Changing environmental conditions and human behavior affect the spread and impact of infectious diseases. In 2008, there were an estimated 9.2 million new cases of tuberculosis globally.[5] Poor health conditions (including co-infection with HIV/AIDS) increase the likelihood of developing active tuberculosis, which can then be spread.[6] Migration and interactions with the environment also influence infectious disease emergence and transmission. Diseases passed from wildlife to humans, such as malaria, are a growing threat to human health, and human pathogens originating from wildlife have increased substantially in recent years.[7]

Economic growth and development can contribute to the emergence of new diseases, even as they bring many benefits.[8] Some of the industrialized agricultural farming and food production practices that often accompany development increase the risk of food products becoming contaminated with *E. coli* and *Salmonella*.[9] Farming practices such as raising poultry in close proximity create conditions that are favorable to outbreaks of avian influenza.[10] Administering antibiotics to livestock and poultry flocks also poses a threat to humans. When humans eat food treated with antibiotics, it can lead to drug-resistant bacteria, rendering some common antibiotics less effective.[11]

Integrating HIV and family planning services can increase access to health care and improve outcomes.

Currently, 33 million people are infected with HIV, more than half of whom are women and girls. Nearly 2 million people die each year globally from AIDS-related causes.[12] In the most heavily affected countries, life expectancies have declined by decades.[13] Furthermore, 17 million children, mostly in sub-Saharan Africa, have been orphaned,[14] labor force productivity has weakened, and household incomes have declined.[15]

Sub-Saharan Africa, where more than two-thirds of all people infected with HIV live, is the hardest-hit region. Sub-Saharan Africa's HIV prevalence rate of 5 percent is higher than any other region. The Caribbean, where an estimated 1 percent of the adult population is living with HIV, has the second-highest average prevalence rate.[16]

Women in sub-Saharan Africa are more likely to be infected with HIV than men. In Southern Africa, new infections affect one-third more women than men. Women's vulnerability to HIV is compounded by gender inequalities. For example, lower socioeconomic status and levels of education can increase their likelihood of infection through disempowered sexual relationships and diminished access to health services.[17]

HIV/AIDS' toll is devastating, but there are some positive signs. The global number of new infections each year has declined, and HIV prevalence has declined significantly in dozens of countries. Successful prevention outreach, which has resulted in safer sexual behavior in many settings, has been a critical factor in this development. In sub-Saharan Africa, HIV incidence has generally stabilized or declined.[18]

Links between Population and Infectious Diseases

Population density and urbanization are two major factors affecting disease spread. People who live in close proximity to one another spread diseases more quickly and easily.[19] Slums around urban areas are extremely vulnerable to infectious diseases due to poor sanitation, high population density and high levels of poverty, all of which increase disease incidence. For example, the increasing number of people living in urban areas around the world will continue to facilitate tuberculosis transmission and weaken attempts to control the disease.[20]

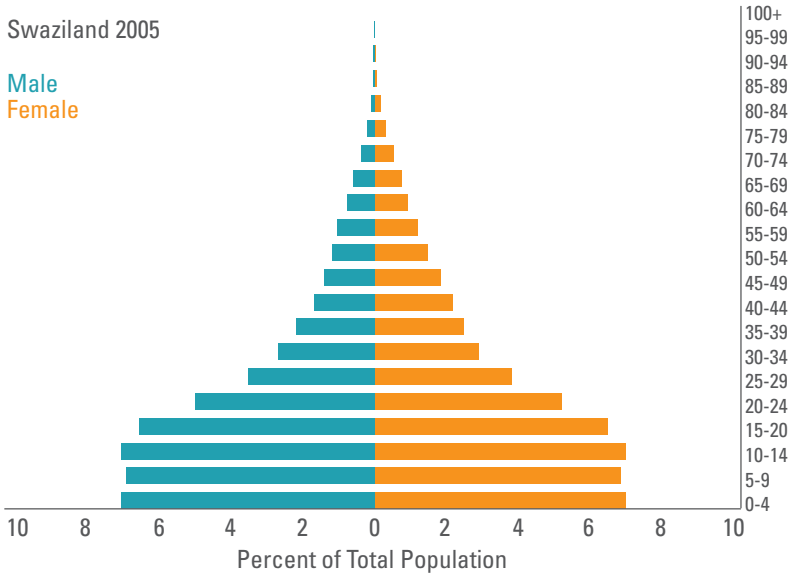
Migration also affects the spread of disease. The probability of encountering new diseases increases as humans move into previously uninhabited lands because of population growth, or as humans migrate into areas where they do not have resistance to certain diseases. People who move from dry highlands to wet lowlands can become exposed to malaria. Migrants may be particularly vulnerable to malarial infection because of the fatigue and malnutrition that accompany relocation.[21] The risk is highest when migrants move to tropical areas, which are home to a larger number of infectious disease pathogens than areas at higher latitudes.[22]

Links between Population and HIV/AIDS

HIV/AIDS has reshaped demographic trends, while population growth has added challenges to addressing the spread of infection. The large number of young people around the world coming into their peak years of sexual activity presents a challenge for HIV/AIDS prevention. More than one-half of the world's population is under age 30, and a quarter is younger than 15.[23] Young people between the ages of 15 and 24 are at a higher risk of HIV infection.[24] There is frequently overlap among countries with youthful populations, high rates of HIV prevalence, and low access to family planning.

Swaziland, for example, is home to 69,000 children orphaned by AIDS,[25] out of a population of 1.2 million. Swaziland has been heavily affected by AIDS-related deaths among working-age adults and fertility remains at an average of four children per woman, leaving an age structure with a large base of economically

FIGURE 2: Swaziland's Age Structure is Shaped by HIV/AIDS



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

dependent young people (see Figure 2). Although AIDS increases mortality rates and shortens life expectancies, even in countries with the highest HIV prevalence, the epidemic has not reached the scale to create population decline. If Swaziland's fertility rate remains unchanged, its population will increase by 39 percent in the 20 years between 2005 and 2025.[26]

High fertility can also mean a high rate of new HIV infections through mother-to-child transmission. Halting the cycle requires ensuring that women who are living with HIV or are at risk of infection have access to anti-retroviral treatment and to contraceptives to prevent unintended pregnancies.

Policy Considerations

Comprehensive prevention policies, programs and services are the most cost-effective ways of reducing the burden of HIV/AIDS and other infectious diseases. One of the primary methods of preventing sexually transmitted HIV is through the use of male and female condoms.[27] Investment in new prevention technologies, especially women-initiated methods like microbicides, is also vital.

Those who seek reproductive health services and those who seek HIV services share many common needs and concerns. Therefore, integrating these services has the potential to increase access to health services and improve health outcomes. Integrated programs that increase women's access to contraceptives result in healthier families and reduced health care expenditures to treat malaria, tuberculosis and other communicable diseases. Beyond access to health care, HIV and infectious disease prevention programs must also address the gender inequalities that increase the likelihood of infection among women.

Endnotes

1 United Nations Population Division. 2009. *World Population Prospects: The 2008 Revision*. New York: UN Population Division.
2 World Health Organization (WHO). 2008. *The Global Burden of Disease: 2004 Update*. Geneva: WHO.
3 McMichael, A J. 2004. "Environmental and Social Influence on Emerging Infectious Diseases: Past, Present and Future." *The Royal Society* 359: 1049-1058.
4 WHO. 2008.
5 World Health Organization (WHO). 2010. *Fact sheet N°104 March 2010 (Tuberculosis)*. Geneva: WHO.
6 World Health Organization (WHO). 2005. *Addressing Poverty in TB Control: Options for National TB Control Programmes*. Geneva: WHO.
7 Jones, K E, N G Patel, MA Levy, A Storeygard, D Balck, J L Gittleman and P Daszak. 2008. "Global Trends in Emerging Infectious Diseases." *Nature* 451(21): 990-994.
8 Jones, Patel, Levy, Storeygard, Balck, Gittleman and Daszak 2008.
9 Weiss, R A and A J McMichael. 2004. "Social and Environmental Risk Factors in the Emergence of Infectious Diseases." *Nature Medicine* 10(12): S70-S76.
10 Weiss and McMichael. 2004.
11 World Health Organization (WHO). 2011. *Antimicrobial Disease: Fact sheet N°194*. WHO. http://www.who.int/mediacentre/factsheets/fs194/en/. Accessed 20 January 2011.
12 Joint United Nations Programme on HIV/AIDS (UNAIDS). 2010. *UNAIDS Report on the Global AIDS Epidemic 2010*. Geneva: UNAIDS.
13 United Nations Population Division. 2010. *Population and HIV/AIDS 2010*. New York: UN Population Division.
14 UNAIDS. 2010.
15 Joint United Nations Programme on HIV/AIDS (UNAIDS). 2006. *2006 Report on the Global AIDS Epidemic*. Geneva: UNAIDS.
16 UNAIDS. 2010.
17 Ibid.
18 Ibid.
19 Jones, Patel, Levy, Storeygard, Balck, Gittleman and Daszak 2008.
20 Morens, D M, G K Folkers and A S Fauci. 2004. "The Challenge of Emerging and Re-Emerging Infectious Diseases." *Nature* 430: 242-249.
21 Prothero, R. 1997. "Migration and Malaria." In Carosi, G and F Castelli, eds. *Handbook of Malaria Infection in the Tropics*. Bologna: Organizzazione per la Cooperazione Sanitaria Internazionale.
22 Guerneir, V, M E Hochberg and J F Guégan. 2004. "Ecology Drives the Worldwide Distribution of Human Diseases." *Public Library of Science Biology* 2(6): 740-746.
23 UN Population Division. 2009.
24 UNAIDS. 2010.
25 Ibid.
26 UN Population Division. 2009.

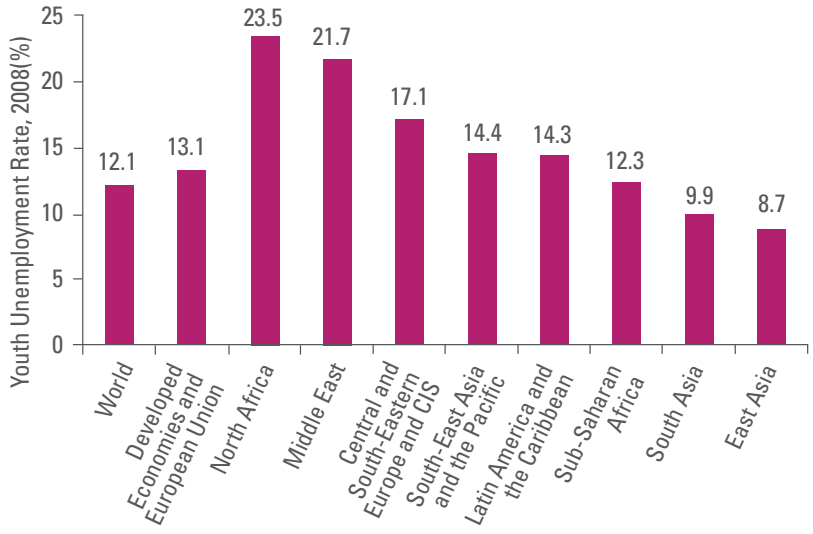
WHY POPULATION MATTERS TO
EDUCATION AND LABOR

WHY POPULATION MATTERS TO **EDUCATION & LABOR**

Population's effects on education and the labor force will influence the opportunities available for the current generation of young people, the largest in history. The demographic transition—the combination of falling mortality rates followed by falling fertility rates—provides countries with a growing number of youth who can be educated and productively employed. With effective government policies and investments, this transition can create an engine for economic growth.

Fertility, education and labor are also related at the individual level. Smaller family size may improve girls' access to education, and educated women are more likely to have smaller families and healthier children.[1] When family planning services are not available, early pregnancy can decrease a woman's educational and economic potential.

FIGURE 1: Youth Unemployment Rates Vary Across Regions



Source: International Labor Organization (ILO). 2010. *Global Employment Trends. Geneva:* ILO.

The State of Education and Labor

Education is necessary to foster national economic growth because it increases levels of human capital by strengthening the abilities and knowledge of individuals. In countries with large youthful populations, universal primary education and widespread secondary education can be a huge boost to economic growth. In such countries, ensuring that half of the population attains some secondary education could more than double annual economic growth rates.[2] In South Korea, the rapid expansion of education among the population beginning in the 1960s contributed to economic growth rates much higher than otherwise projected.[3]

Globally, unemployment rates for young people are on average three times higher than for adults, and the number of unemployed youth has grown dramatically in recent years. Regionally, the highest rates of youth unemployment—above 20 percent—are found in the Middle East and North Africa (Figure 1).[4] There are a number of reasons for high youth unemployment. Countries with youthful populations may have difficulty absorbing the large numbers of job-seekers. Younger people are more likely to be placed in part-time or temporary work, and can lack the training and skills sought by employers. Employers are also more likely to lay off younger employees due to their relatively low seniority.[5]

In addition to widespread education and opportunities for youth, employment for women is important to achieving full potential in the labor market. In 2008, women represented about 40 percent of the global labor force, despite comprising 49 percent of the working-age population.[6,7] The proportion of working-age women who are employed lags behind men in all regions. Globally, males are employed at a rate of 25 percentage points above females. In the Middle East and North Africa, less than one-quarter of women of working age are employed compared to more than two-thirds of men. The gender difference

in employment-to-population rates is smallest in East Asia (See Figure 2 below).[8]

Links between Population and Labor

Over the course of decades, many countries around the world have made a transition from high fertility and mortality rates to lower death rates and, later, smaller family sizes. During the beginning and end of this shift, the population is relatively stable as births and deaths cancel each other out. But during the early transition period, mortality rates decline while fertility rates remain high, creating rapid growth and a larger share of young people within a population.[9] Then, as fertility begins to decline, there is a short "window of opportunity" when there are more working-age people and fewer children and elderly dependents.[10]

A large working-age population and fewer dependents can increase savings and spur economic growth. However, education and stable employment opportunities for young people are essential for this to occur. Several non-demographic factors are important, including a diverse economy, equitable opportunities, investment, and access to credit.[11,12]

On the other hand, at the beginning and end of the transition period, there are greater numbers of young and old people depending on each person of working age.[13] Large numbers of dependent household members can reduce family well-being among the poor because more household income is spent providing for children and the elderly.[14] When labor markets are unable to keep pace with rapid growth among the working-age population in the early stages of the demographic transition, unemployment can become a serious challenge. For example, if fertility rates in Uganda continue to average above six children per woman, by 2037 the economy would need to produce 1.5 million new jobs annually. Yet in 2009, only 100,000 new jobs were available.[15]

One factor that keeps women out of the labor force is an unmet need for family planning. By preventing unintended pregnancies, giving women access to family planning can enhance women's educational and employment opportunities and increase their financial contribution to their families and communities.[16] Women's labor force participation can foster women's empowerment: Women who earn their own income or have access to credit are likely to have more say in household decision-making, maintain more assets, and experience reduced levels of domestic violence.[17]

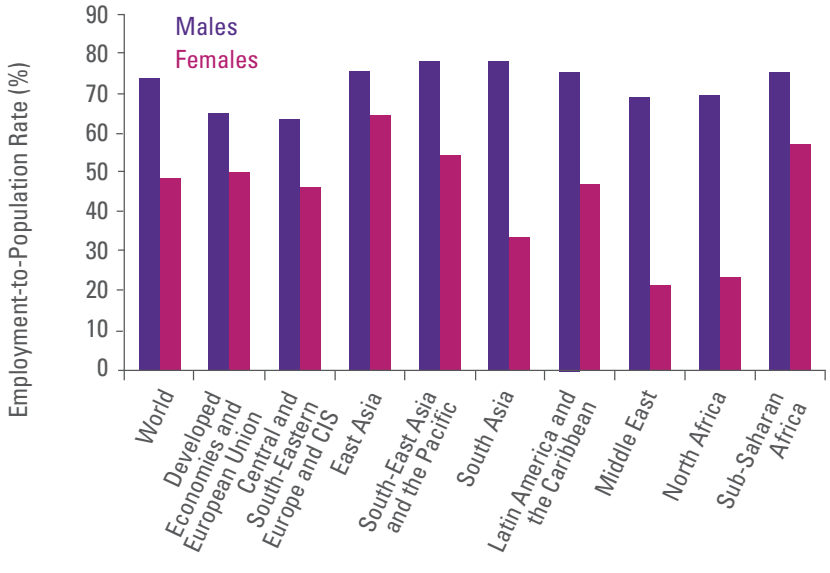
Links between Population and Education

Smaller family sizes allow more children to be educated[18] and can promote girls' education. Family size has the greatest impact on educational achievement in households where schooling is available, but expensive.[19] The links between poverty and education are especially relevant for girls. Girls from large families with relatively limited resources are the least likely to attend school.[20]

Meeting the unmet need for family planning gives women the opportunity to explore education and vocational opportunities.

It is also true that educated women often have fewer children. Education helps couples to achieve their desired family size by enhancing their ability to use effective contraception and by increasing women's confidence in demanding health care. Educated mothers may be more supportive of

FIGURE 2: Globally, Men Have a Higher Employment Rate than Women



Source: International Labor Organization (ILO). 2010. *Global Employment Trends. Geneva:* ILO.

sending their children to school, and since they also tend to be employed, these mothers have more resources to invest in education.[21] When young women do not have access to comprehensive sexuality education or family planning, they are more likely to become pregnant and drop out of school. This is particularly true in Africa and Latin America, where in many countries up to 10 percent of women ages 20 to 24 reported dropping out of school because of pregnancy.[22]

Surveys show that women with no education often desire a larger family than their educated peers. In Kenya and Uganda, for example, women with no education prefer two to three more children than women who have completed secondary school.[23]

Policy Considerations

Large youthful populations entering the labor market can be an economic asset, or a challenge in countries with economic troubles and high unemployment. Policymakers must provide education that prepares youth to enter the labor force, and family planning to meet the growing desire for smaller family sizes. Access to family planning can keep young women in schools and allow them to enter the global labor force. These services, along with other efforts to address gender inequality, are critical to ensure that women and girls are able to access the same employment and education opportunities as men and boys.

Special attention also needs to be paid to providing services to ease the burden on household caregivers at both ends of the demographic transition. This means making sure women and young people, who are often the primary care-givers of children and elderly relatives, have access to high quality, affordable child and elder care so they can take advantage of higher education and employment opportunities.

Younger, educated populations are particularly well-positioned to adapt to new industries and changing technology, but need the support of a government willing to invest in education at all levels and retraining when necessary. As demand for primary education decreases with declining fertility, policymakers can shift funds to broadening access to secondary and tertiary education to create a better-educated labor force.[24] For the demographic dividend to provide economic benefits, human capital, equitable access to employment, and a diversified economy are critical.

When large population groups reach retirement, policymakers must cope with a shrinking labor force and aging population that requires adequate pension and health systems. Aging reflects relatively recent improvements in public health and lower fertility rates, and governments' responses are still developing. Numerous policy responses have been proposed, including extending the tenure of working years, importing labor through immigration, addressing the underlying causes of low fertility rates, and modifying health care and social welfare systems. In cases where fertility rates are extremely low, existing policies and norms may not enable women to balance a career and family responsibilities.

Endnotes

1 Abu-Ghaida, D and S Klasen. 2004. "The Economic and Human Development Costs of Missing the Millennium Development Goal on Gender Equity." Washington, DC: World Bank; Cleland, J. 2002. "Education and Future Fertility Trends, with Special Reference to Mid-Transitional Countries." *Expert Group Meeting on Completing the Fertility Transition, New York, 11-14 March 2002*. Compiled by United Nations Population Division. New York: UN Population Division; Rahman,M, J DaVanzo and A Razzaque. 2002. "When Will Bangladesh Reach Replacement-Level Fertility? The Role of Education and Family Planning Services." *Expert Group Meeting on Completing the Fertility Transition, New York, 11-14 March 2002*. Compiled by United Nations Population Division. New York: UN Population Division; Drèze, J and M Murthi. 2001. "Fertility, Education, and Development: Evidence from India." *Population and Development Review:* 27(1): 33-63.

2 Lutz, W, J C Cuaresma and W Sanderson. 2008. "The Demography of Educational Attainment and Economic Growth." *Science*. 319(5866):1047-1048.

3 Samir, K C, V Skirbekk, B Barakat, W Sanderson, A Goujon and W Lutz. 2010. "Projection of Populations by Level of Educational Attainment, Age and Sex for 120 Countries for 2005-2050." *Demographic Research* 22(15): 383-472.

4 International Labor Organization (ILO). 2010. *Global Employment Trends: January 2010*. Geneva: ILO.

5 International Labor Organization (ILO). 2010. *Global Employment Trends for Youth: August 2010*. Geneva: ILO.

6 International Labor Organization (ILO). 2009. *Global Employment Trends for Women March 2009*. Geneva: ILO.

7 United Nations Population Division. 2009. *World Population Prospects: The 2008 Revision*. New York: UN Population Division.

8 ILO . 2010. *Global Employment Trends: January 2010*.

9 Bongaarts, J. 2001. "Dependency Burdens in the Developing World." In Birdsall, N, A Kelley and S Sinding, eds. *Population Matters: Demographic Change, Economic Growth, and Poverty in the Developing World*. Oxford: Oxford University Press.

10 Merrick, T. 2002. "Population and Poverty: New Views on an Old Controversy." *International Family Planning Perspectives:* 28(1).

11 Lloyd, C B. 2005. *Growing Up Global: The Changing Transitions to Adulthood in Developing Countries*. Washington, DC: National Academy of Sciences.

12 Bloom, D, D Canning and J Sevilla. 2003. "The Demographic Dividend: A New Perspective on the Economic Consequences of Population Change." *Population Matters*. Santa Monica: RAND.

13 Bongaarts. 2001.

14 United Nations Population Fund (UNFPA). 2002. *State of the World Population: People, Poverty and Possibilities*. New York: UNFPA.

15 Uganda Population Secretariat. 2010. *Uganda: Population Factors & National Development*. Kampala: Population Secretariat.

16 Singh, S, J Darroch, L Ashford and M Vlassoff. 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.

17 Kabeer, N. 2005. "Gender Equality and Women's Empowerment: A Critical Analysis of the Third Millennium Development Goal." In Sweetman, C, ed. *Gender and the Millennium Development Goals*. Oxford: Oxfam GB.

18 Lloyd. 2005.

19 United Nations Population Division. 2004. *World Population Monitoring 2003: Population, Education and Development*. New York: UN Population Division.

20 Lloyd, CB. 1994. "Investing in the next generation: The implications of high fertility at the level of the family." Population and Development: Old Debates, New Conclusions. Washington, DC: Overseas Development Council.

21 UNFPA. 2002.

22 Lloyd, C B. 2006. *Schooling and Adolescent Reproductive Behavior in Developing Countries*. Background paper prepared for the United Nations Millennium Project. New York: United Nations Millennium Project.

23 Kenya National Bureau of Statistics (KNBS) and ICF Macro. 2010. *Kenya Demographic and Health Survey 2008-09*. Calverton, Maryland: KNBS and ICF Macro; Uganda Bureau of Statistics (UBOS) and Macro International Inc. 2007. *Uganda Demographic and Health Survey 2006*. Calverton, Maryland: UBOS and Macro International Inc.

24 Bloom, Canning and Sevilla. 2003.

WHY POPULATION MATTERS TO
POVERTY REDUCTION

WHY POPULATION MATTERS TO **POVERTY REDUCTION**

Around 1.4 billion people—one-quarter of the population of the developing world—lived on less than $1.25 a day in 2005.[1] The World Bank projects that the number of poor people will increase in the coming years due to slowing economic growth, and that reduced levels of development assistance will slow poverty reduction efforts.[2] But numbers barely capture the true dimensions of global poverty. The definition of poverty reaches beyond income to encompass poor access to education and health, lack of opportunities, gender inequality and environmental degradation.

Population has the potential to impact all aspects of poverty. Fertility trends can help a country determine when and how to invest in its population and jump-start economic development. Similarly, meeting women's needs for family planning around the world can help increase overall development and help diminish many impacts of poverty.

The State of Poverty

Global commitment to reduce poverty is strong, but progress has been mixed. The percentage of people living on less than $1.25 a day in 2015 is expected to drop to half of what it was in 1990. This would achieve the first United Nations Millennium Development Goal. But the number of individuals suffering from hunger and malnutrition is higher than ever before. The global economic crisis has also shifted tens of millions of people into extreme poverty.

Poverty has many regional variations, and while it has declined or remained constant in much of the world, more than 40 percent of the population in South Asia and sub-Saharan Africa live on less than $1.25 per day (Figure 1). The number of people living in extreme poverty in sub-Saharan Africa increased by 35 percent since 1990 to 384 million in 2005.[3] Advancement on issues that influence poverty, such as food costs and women's inequality, has been slow-moving at best. For example, 30 percent of girls living in poverty do not attend primary school,

and high food prices continue to drain the budgets of low-income families.

Links between Population, Economic Growth and Poverty

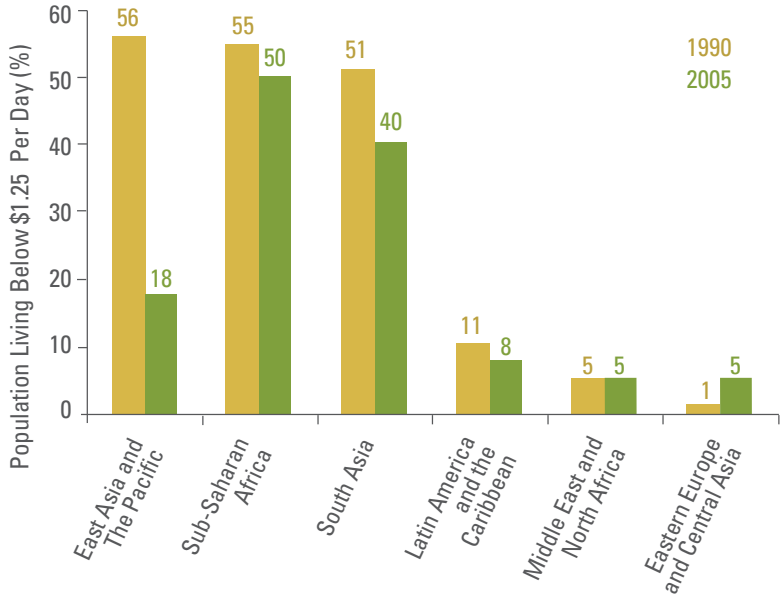
There has been considerable debate over the relationships between population growth, economic growth and poverty. In recent years, statistical analysis has revealed that population growth alone doesn't inherently increase or decrease economic growth.[4] However, other demographic trends do affect the prospects for economic development, including poverty reduction. In particular, countries can experience economic growth and improve individual well-being by taking advantage of specific changes in the age structure of their populations.

Over time, a population characterized by high fertility and mortality rates progresses in stages through declines in mortality and, later, fertility rates. Early in this demographic transition, when mortality has declined but fertility remains high, there are a large number of children and elderly dependents for each person of working age.[5] High fertility can strain low-income families' ability to provide for children.[6]

As fertility rates decline, a large working-age population and fewer dependents should increase savings and investment. This period is known as the "demographic dividend," and it has potential benefits for households and countries alike. Smaller family size can promote increased savings at the household level, which families can choose to invest in the health and education of their children. For example, in Matlab, Bangladesh, an integrated family planning and maternal and child health program led to improved overall household and community living standards. The families who benefited from the program saw higher incomes, greater assets and savings, and higher educational and health outcomes.[7]

At the country level, savings give governments an opportunity to educate their youth and stimulate economic development by investing in hospitals and health care workers, schools and well-trained teachers, and communications and transportation networks. However, for this to happen, governments must be prepared to train and expand job opportunities for their growing labor force. In East Asia, governments capitalized on their large populations of young workers with such policies. This contributed to at least one-third of the region's economic

FIGURE 1: Poverty Rates Decline Globally, but Remain High in Many Regions



Source: Chen, S and M Ravallion. 2008. "The Developing World Is Poorer Than We Thought, But No Less Successful in the Fight against Poverty." Washington, DC: World Bank.

With the increased savings that result from smaller family size, families are better able to invest in education for their children.

growth over the last four decades.[8] In contrast, the failure of Latin American countries to adequately invest in education and provide sufficient employment opportunities during their demographic dividend inhibited their economic growth. Similar policy weaknesses may prevent India and Bangladesh from seeing potential economic gains.[9]

The demographic dividend typically lasts a few decades, depending on the speed of the country's transition to lower mortality and fertility rates. Afterward, households and countries are again faced with a high number of dependents—this time older, retired adults. This type of mature age structure characterizes most industrialized countries in the world. Although governments and societies will experience challenges from population aging, the economic effects are still unknown and may be manageable with advance planning.[10]

Policy Considerations

The demographic dividend, which only occurs once fertility rates have begun to fall, offers countries a chance to capitalize on the productivity of their growing workforce to boost economic growth and reduce poverty. However, for this to be achieved, governments must provide education and a stable, fair and diverse set of economic opportunities for job seekers.

The prospects for poverty reduction and economic growth ultimately depend on individual livelihoods and opportunities. Gender equity is a particular priority. Meeting women's needs for family planning would avoid numerous pregnancy-related complications that can prevent women from making a living and put a strain on household incomes.[11] Women who are able to delay or stop childbearing when they wish are more likely to meet their educational goals, send their daughters to school, earn a living and support their families, and manage changes in their environment and natural resources. Experiences such as the Matlab project show that meeting women's needs for contraception can help lift them and their families out of poverty.

Endnotes

1 United Nations (UN). 2010. *The Millennium Development Goals Report*. New York: UN.

2 World Bank. 2010. *Global Economic Prospects: Fiscal Headwinds and Recovery*. Washington, DC: World Bank.

3 Chen, S and M Ravallion. 2008. "The Developing World Is Poorer Than We Thought, But No Less Successful in the Fight against Poverty." Washington, DC: World Bank.

4 Bloom, D, D Canning and J Sevilla. 2003. *The Demographic Dividend: A New Perspective on the Economic Consequences of Population Change*. Santa Monica: RAND.

5 Bongaarts, J. 2001. "Dependency Burdens in the Developing World." In Birdsall, N, A Kelley and S Sinding, eds. *Population Matters: Demographic Change, Economic Growth, and Poverty in the Developing World*. Oxford: Oxford University Press.

6 United Nations Population Fund (UNFPA). 2002. *State of the World Population 2002: People, Poverty and Possibilities*. New York: UNFPA.

7 Joshi, S and T P Shultz. 2007. "Family Planning as an Investment in Development: Evaluation of a Program's Consequences in Matlab, Bangladesh." *Center Discussion Paper No. 951*. New Haven: Yale Economic Growth Center.

8 Williamson, J. 2001. "Demographic Change, Economic Growth and Inequality." In Birdsall, N, A Kelley and S Sinding, eds. *Population Matters: Demographic Change, Economic Growth and Poverty in the Developing World*. Oxford: Oxford University Press.

9 Merrick, T W. 2002. "Population and Poverty: New Views on an Old Controversy." *International Family Planning Perspectives* 28(1): 41-46.

10 Coleman, D and R Rowthorn. 2011. "Who's Afraid of Population Decline? A Critical Examination of Its Consequences." *Population and Development Review* 37(Supplement): 217-248.

11 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.

WHY POPULATION MATTERS TO MIGRATION AND URBANIZATION

WHY POPULATION MATTERS TO **MIGRATION AND URBANIZATION**

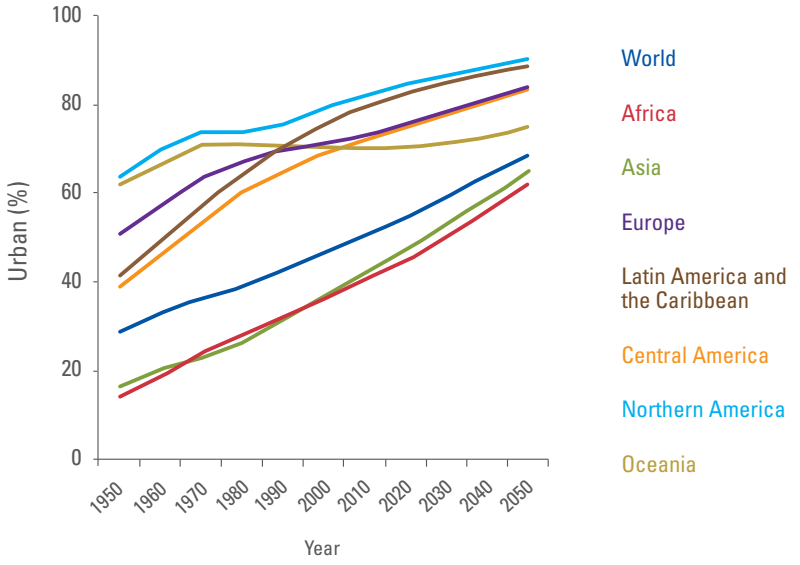
People are moving from place to place more than ever before. Rates of international migration are increasing, and more than half of the world's population now lives in cities.[1] Many personal, economic, and environmental factors drive migration, and the pressures of population growth often contribute to individuals' decisions to move. Improving the status of women through increased access to reproductive health care in rural and urban areas can affect migration and urbanization trends by reducing demand for public services and increasing employment and economic opportunities.

The State of Migration and Urbanization

In 2010, more than 200 million people—about 3 percent of the world's population—lived in a country different from the one in which they were born, and internal migration within countries continues at high levels.[2] International migrants, who may move permanently or temporarily to another country, are equally likely to be men or women.[3] About 10 percent of the population of developed countries is comprised of international migrants, who commonly migrate for economic reasons. Less than 10 percent of international migrants are refugees from conflict.[4]

Nearly half of those who move from developing countries reside in other developing countries, usually one that shares a border.[5] Australia/New Zealand and other Pacific countries, North America and Western Europe have the greatest share of international migrants within their populations, while Polynesia and Central America see

FIGURE 1: Urbanization Continues Across All Regions
North America and Latin America projected to remain most urbanized despite highest urban growth rate in Asia and Africa



Source: United Nations Population Division. 2010. *World Urbanization Prospects: The 2009 Revision*. New York: UN Population Division.

the greatest share of their residents migrate abroad.[6] Migration is often equated with international movement, but migration within countries, primarily from rural to urban areas, accounts for a much greater share of the movement within human populations than international migration.

As of 2009, more than half of the world's population lived in urban areas. Urbanization is commonly associated with mega-cities (cities with over 10 million inhabitants), but the majority of the world's urban population lives in cities with fewer than 500,000 inhabitants.[7]

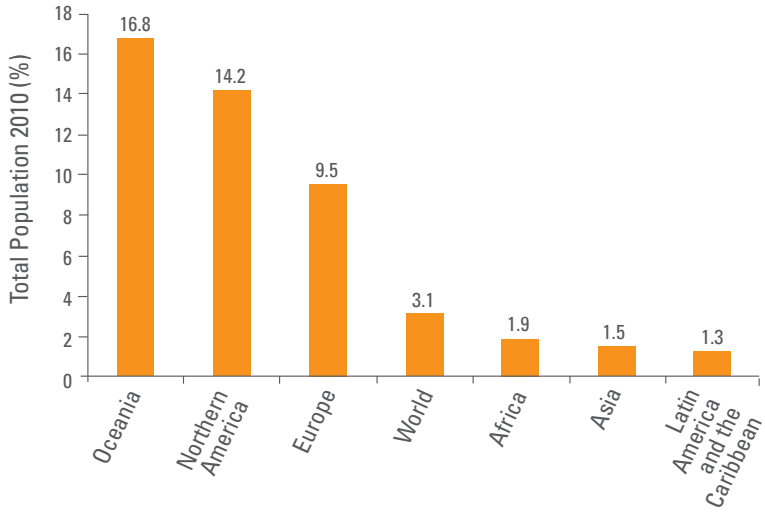
The United Nations Population Division projects that the global urban population will almost double from 3.5 to 6.3 billion by 2050 (Figure 1), assuming that fertility rates decline in developing countries. This increase in the number of people living in cities would be equal to the current populations of China, India and the United States combined. Most of this urban growth will take place in Asia and Africa.[8]

Urban populations generally benefit from higher incomes and better access to health care services compared with rural areas, but disparities remain between the rich and poor within cities. Informal settlements and slums—which house more than 1 billion of the world's urban dwellers—are often not equipped with basic sanitation systems. Across sub-Saharan Africa, more than half of the urban population lives in areas where access to basic infrastructure, such as private toilets, is limited.[9] One study found that the child mortality rate in Nairobi's slums was far higher than the rural child mortality rate.[10]

Links between Population and International Migration

Given the significant number of people moving to new countries in some regions, migration will shape future demographic trends (Figure 2). By 2050, between 15 and 36 percent of the population of various countries in Western Europe is projected to be of "foreign origin."[11] International migration impacts a receiving country's

FIGURE 2: Oceania, Northern America and Europe Have Highest Share of International Migrants



Source: United Nations Population Division. 2009. *International Migrant Stock : The 2008 Revision*. New York: UN Population Division.

age structure in three ways: through the numerical size of the immigrant population, the concentration of immigrants among the working-age adult population, and the fertility rate among immigrants.

The movement of people from developing to developed countries can lessen the economic effects of population aging in low-fertility countries. As large numbers of a country's citizens move into retirement, the labor force shrinks, putting a strain on the economy. Migrants are usually of working age and fill employment gaps in labor sectors. If all international migration ended immediately, the working-age population of developed countries would decline by more than 20 percent between 2005 and 2050.[12] Migration, however, is unlikely to reach the vast scale needed to completely offset the demographic effects of lower fertility rates.

International migration also alters a country's age structure because migrant women often have higher fertility rates than women in the receiving countries. Migrants' fertility rates are much more related to their socioeconomic status or the norms and values of their country of origin than to factors such as religion. A review of surveys from 1991 through 2005 found that fertility rates among immigrant women in Europe ranged from 17 to 52 percent higher than those of native-born women. However, this effect diminishes over time: Within as few as 10 years, the average number of children among most groups of immigrants from higher-fertility countries declines to the level of their peers in the receiving country.[13]

Migration also has economic effects on developing countries, particularly through remittances, or money sent from international migrants to their families at home. In 2009, a total of $316 billion in remittances was sent to developing regions; in nine countries, these sums exceeded one-fifth of national gross domestic product.[14] In many countries, remittances are very effective at reducing poverty in the families of those who have migrated, and, to a lesser degree, in their surrounding communities.[15] Although the extended absence of migrants challenges families and communities, migration can also have positive social benefits, especially for girls. In rural Pakistan, where girls are generally underrepresented in school enrollment rates, girls from migrant households are healthier, more likely to stay in school, and are less likely to be sent to work.[16]

Though the size of cities may range, across the world more than half of the current population lives in urban areas which add increasing pressure on both public infrastructure and health systems.

Links between Population and Urbanization

As populations progress through the demographic transition—the change over time from higher to lower mortality and fertility rates—fertility tends to decline earlier and at a more rapid pace in urban areas. Demographic household surveys conducted in sub-Saharan Africa since 2000 show that urban fertility rates are lower than those in rural areas by at least one child per woman in 22 of 23 countries, as Figure 3 shows for five countries in East Africa.[17] This disparity in fertility between urban and rural areas tends to diminish as countries progress to lower overall fertility rates.[18] In cities, a number of factors contribute to lower fertility rates. These include higher costs of raising children, a more educated population, higher age at marriage and greater access to contraception.[19]

Urban fertility rates, while lower than in rural areas, are still high enough to generate population growth. In many cities, average fertility rates still exceed the replacement level (approximately 2.1 children per woman). The growth

of cities large and small is often thought to be a result of migration. But more urban population growth is due to natural increase from high birth rates than to urbanization itself.[20]

Forced Migration

Millions of people have been displaced by natural disasters and conflict. As climate change redraws coastlines and constrains natural resources, more people will be forced to move, often to urban areas. Political turmoil and conflicts also displace many people from their homes each year. Worldwide, there are over 40 million refugees, internally displaced persons and asylum-seekers.[21]

THE ENVIRONMENT AND CLIMATE CHANGE

Although individual well-being and economic opportunity are often driving forces for migration, environmental factors also play an underlying role. In some cases, such as natural disasters, the environment is a direct cause of migration; in others, such as declining availability or quality of land for farming, it is one of many contributing factors. Those who migrate for environmentally-induced reasons are more likely to move to an urban location in their own country than to cross borders.[22]

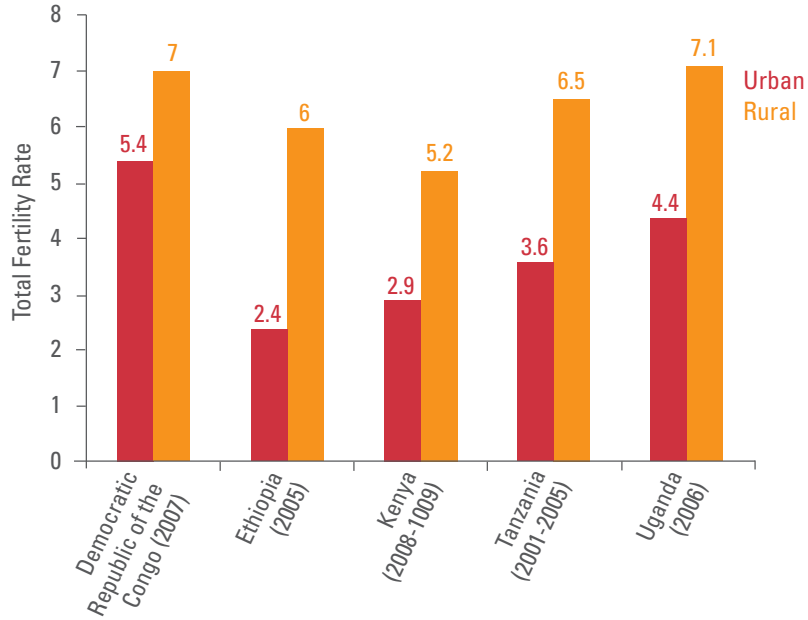
The impacts of climate change are likely to have an even greater influence on migration. Diminished agricultural capacity, increased frequency of extreme weather events such as floods, and rise in sea level are likely to contribute to migrants' decisions to move.[23] Many adverse effects of climate change will be felt among people in the countries and regions least equipped to adapt. These include arid areas of sub-Saharan Africa, and flood-prone, low elevation coastal zones like Bangladesh—areas that also have high rates of population growth.[24]

By one projection, 200 million people could be displaced by flooding, droughts, changing weather patterns and other impacts of climate change.[25] This environmental displacement would result in an estimated one in 45 people worldwide being displaced by climate change.[26]

CONFLICT

Conflicts and violence around the world also continue to displace people, moving them into temporary displacement or refugee camps, or to urban slums where access to quality reproductive health services is limited. In Africa, almost half of all countries are experiencing current or recent conflict.[27] Forced migration due to conflict has a negative impact on developing economies and the government's ability to provide lifesaving services. Today, the average length of displacement from conflict for refugees is 17 years.[28]

FIGURE 3: Urban Fertility Rates are Typically Lower than Rural Fertility Rates



Source: MEASURE DHS. *Demographic and Health Surveys.* Various countries, most recent year available. http://www.measuredhs.com/countries/. Accessed 15 December 2010.

Policy Considerations

Population growth and high fertility rates in rural and urban areas will have significant impacts on migration, economic development and the environment. Migration and urbanization trends should be considered in plans to address workforce shortages in countries that send and receive large numbers of internal and international migrants. As urbanization continues, the infrastructure for health and other social services in cities needs to improve, and resources should be used more efficiently to meet the needs of growing populations.

Improving access to family planning and reproductive health care services in both rural and urban areas can help address some of factors that contribute to migration and urbanization, as well as benefit individuals, communities and the environment. Urbanization combined with high fertility rates and low contraceptive use contributes to rapid population growth. In both urban and rural settings, marginalized populations lack access to reproductive health information and services. Lack of access is often compounded for those who live in rural areas far from the nearest health care facility, or who lack legal recognition in urban slums without local services. The needs of these marginalized populations should be taken into account when designing programs and services to address the population impacts of migration and urbanization.

Endnotes

1 International Organization for Migration. 2010. *Facts & Figures*. http://www.iom.int/jahia/Jahia/about-migration/facts-and-figures/lang/en; Accessed 29 December 2010; United Nations (UN) Population Division. 2010. *World Urbanization Prospects: The 2009 Revision*. New York: UN Population Division.

2 International Organization for Migration. 2010.

3 United Nations Population Division. 2009. *International Migrant Stock : The 2008 Revision*. New York: UN Population Division.

4 United Nations Population Division. 2006. *International Migration 2006*. New York: UN Population Division.

5 UN Population Division. 2006; Ratha, D and W Shaw. 2007. "South-South Migration and Remittances." World Bank Working Paper No. 102. Washington, DC: World Bank.

6 UN Population Division. 2006.

7 UN Population Division. 2010.

8 Ibid.

9 United Nations Human Settlements Programme (UN-HABITAT). 2004. *The State of the World's Cities 2004/2005*. London: UN-HABITAT.

10 Montgomery, M and P Hewett. 2005. "Urban Poverty and Health in Developing Countries: Household and Neighborhood Effects." *Demography* 42(3): 397-425.

11 Coleman, D. 2006. "Immigration and Ethnic Change in Low-Fertility Countries: A Third Demographic Transition." *Population and Development Review* 32(3): 401-446.

12 UN Population Division. 2010.

13 Sobotka, T. 2008. "The Rising Importance of Migrants for Childbearing in Europe." *Demographic Research* 19(9): 225-248.

14 Ratha, D. 2010. "Remittance Flows to Developing Countries Remained Resilient in 2009, Expected to Recover During 2010-11." World Bank. http://blogs.worldbank.org/peoplemove/remittance-flows-to-developing-countries-remained-resilient-in-2009-expected-to-recover-during-2010. Accessed 2 February 2011; Ratha, D, S Mohapatra and Z Xu. 2008. *Migration and Development Brief 8*. Washington, DC: World Bank.

15 Acosta, P, P Fajnzylber and J Humberto Lopez. 2007. "The Impact of Remittances on Poverty and Human Capital: Evidence from Latin American Household Surveys." In Ozden, C and M Schiff, eds. *International Migration, Economic Development and Policy*. Washington, DC: World Bank.

16 Mansuri, G. 2007. "Does Work Migration Spur Investment in Origin Communities? Entrepreneurship, Schooling and Child Health in Rural Pakistan." In Ozden, C and M Schiff, eds. *International Migration, Economic Development and Policy*. Washington, DC: The World Bank.

17 MEASURE DHS. Various years. *Demographic and Health Surveys*. http://www.measuredhs.com/countries/start.cfm. Accessed 7 April 2010.

18 Kreider, A, D Shapiro, C Varner and M Sinha. 2009. "Socioeconomic Progress and Fertility Transition in the Developing World: Evidence from the Demographic and Health Surveys." University Park, PA: Pennsylvania State University.

19 Mace, R. 2008. "Reproducing in Cities." *Science* 319(5864): 764-766; Adhikari, R. 2010. "Demographic, Socio-economic and Cultural Factors Affecting Fertility Differentials in Nepal." *BMC Pregnancy and Childbirth* 10(19); White, M J, S Muhidin, C Andrzejewski, E Tagoe, R Knight and H Reed. 2008. "Urbanization and Fertility: An Event-History Analysis of Coastal Ghana." *Demography* 45(4): 803-816.

20 United Nations Population Fund (UNFPA). 2007. *State of the World Population 2007: Unleashing the Potential of Urban Growth*. New York: UNFPA; Montgomery, M. 2008. "The Urban Transformation of the Developing World." *Science* 319(8 February): 761-764.

21 United Nations High Commissioner for Refugees (UNHCR). 2010. *Statistical Yearbook 2009*. Geneva: UNHCR; International Organization for Migration 2010.

22 Morton, A, P Boncour and F Laczko. 2008. "Human Security Policy Changes." *Forced Migration Review* 31: 5-7.

23 Morton, Boncour and Laczko. 2008.

24 Intergovernmental Panel on Climate Change. 2007. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, UK: Cambridge University Press; United Nations Environment Programme (UNEP). 2007. *Global Outlook for Ice and Snow*. Nairobi: UNEP; 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(1): 17-37; McGranahan, G, D Balk and B Anderson. 2007. "Climate Change and the Risk of Settlement in the Low Elevation Coastal Zone." *IHDP Update 2007*: 12-14; World Bank. 1999. *World Development Report*. Washington, D.C.: World Bank.

25 Myers, N. 2005. "Environmental Refugees: An Emergent Security Issue." Presented at Organization for Security and Cooperation in Europe 13th Economic Forum, Prague, 23-27 May.

26 Brown, O. 2008. "The Numbers Game." *Forced Migration Review* 31: 8-9.

27 Gettleman, J. 2010. "Africa's Forever Wars." *Foreign Policy* (March/April).

28 Ferris, E. 2008. "Natural Disaster- and Conflict-Induced Displacement: Similarities, Differences and Inter-Connections." Presentation prepared for Brookings Institution, Washington, DC, March 27.

WHY POPULATION MATTERS TO SECURITY

WHY POPULATION MATTERS TO **SECURITY**

Demographic trends influence political stability and security. Over the past several decades, countries in which at least 60 percent of the population is younger than 30 have been more likely to experience outbreaks of conflict than countries with a more even age distribution.[1] Countries with very young age structures, in which at least two-thirds of the population is younger than 30, have a consistently growing group of young people entering the labor market and seeking opportunities. With sound policies, this can be a benefit. But it can also challenge a government's capacity to provide sufficient jobs, education and resources for its population, and can increase the likelihood of conflict.

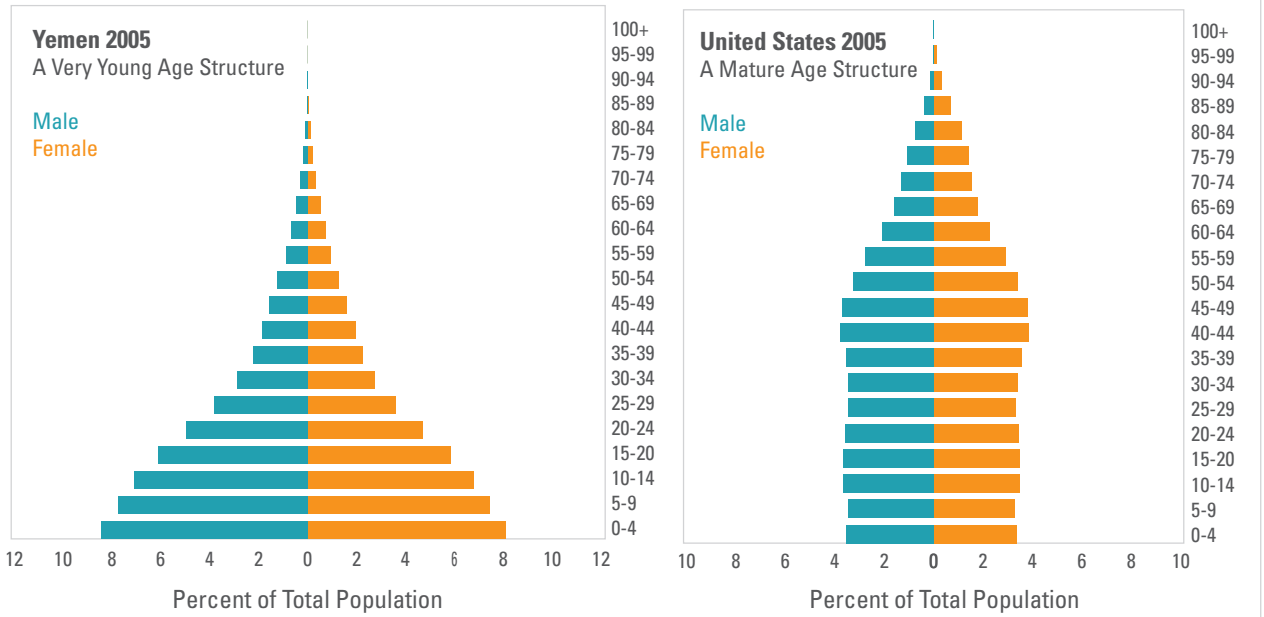
The State of Human Security

Of all forms of political violence, the greatest toll comes from civil conflicts. Low-level civil conflicts—those involving a country's government but resulting in fewer than 1,000 annual deaths—have increased in the last 60 years.[2]

In recent years, many scholars and policymakers have adopted a broader framework of human security, which includes four elements: survival and physical safety; conditions for health and economic well-being; legitimate, trustworthy and capable governance; and individual dignity.[3] In 2004, the United Nations established a Human Security Unit promoting the protection and empowerment of people to achieve "survival, livelihood and dignity."[4] U.S. military and civilian defense agencies are also looking to move toward a "prevent-and-deter" approach, focused on "supporting and stabilizing fragile states" and "preventing human suffering."[5]

Security can be uneven across a population, with those who are poor and/or marginalized—including women—facing both higher risks of physical violence and greater difficulties in access to education,

FIGURE 1: Population Age Structures at the Beginning and End of the Demographic Transition



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

housing and jobs. When human security does not exist, conflict is harder to prevent. Demographic trends can hinder the achievement of human security, and thus affect the security of a nation.

Links between Population and Security

Many country governments have expressed concern about meeting the needs of their growing youthful populations. In Uganda, which had the youngest age structure in the world in the 2000s, a member of Parliament has noted that "We are growing at a very fast pace, and looking at the projections, it can't be sustained. We have a bank of young people who are dependent, unemployed or can't make a living."[6] In Yemen, where water supplies are already running short and the population is on track to nearly double in 20 years, an official has warned that "Population growth is putting pressure on the country's resources. If the situation remains as it is, the state would not be able to meet the demands of its people."[7]

Population is an underlying variable for conflict. Demographic changes alone are unlikely to spark political violence, but can influence other triggers of conflict. The social, economic, political and environmental context matters, and there is no single formula to guarantee successful conflict prevention. Large numbers of young people in a population, when coupled with socioeconomic problems, can leave individuals more susceptible for recruitment into insurgencies. Few chances to find employment or otherwise improve lives can both generate grievances and make taking part in violent action seem less risky.[8] Where jobs are lacking or only available to the well-connected, a youthful age structure increases the number of job seekers and decreases the odds of employment.

As U.S. foreign policy has focused more on threats posed by states that cannot meet the needs of their people, policymakers have learned the importance of demographic factors in evaluating risk. The National Intelligence Council, in its *Global Trends 2025* assessment, characterized a demographic "arc of instability" that crosses much of sub-Saharan Africa, the Middle East and South Asia as a risk factor for civil conflict.[9] In a 2010 speech, the commander of the U.S. Africa Command noted the challenges that population growth poses to other aspects of development, including food security, health and environment.[10]

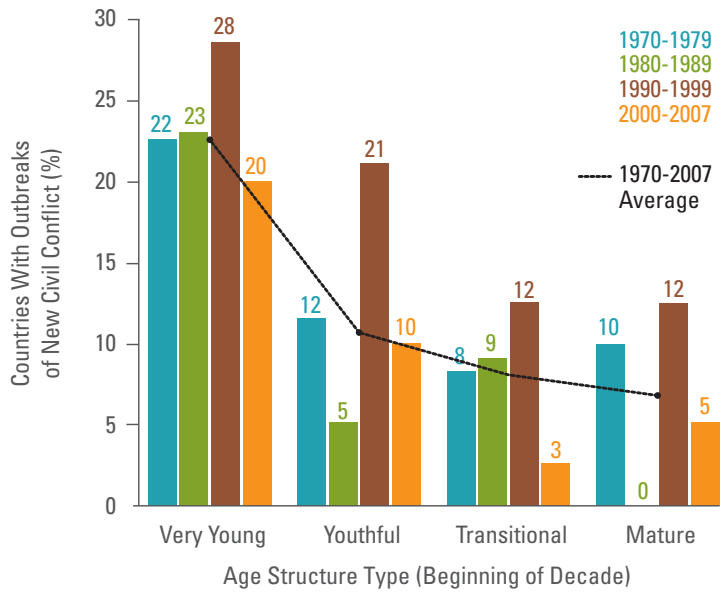
Population Age Structures

Today, population trends are moving in different directions around the world, creating an unprecedented "demographic divide." More than one

billion people, including most of the population of sub-Saharan Africa, live in countries where the average woman has more than four children. A major cause of ongoing high fertility rates is the low use of family planning. Meanwhile, about 40 percent of the world's population lives in countries where fertility rates are low enough to lead to aging and eventual decline.[11]

Countries where two-thirds or more of the total population are younger than age 30 have high fertility rates and very young age structures. When fertility rates begin to decline but are still fairly high, countries develop a youthful age structure, in which 60 to 67 percent of the population is younger than age 30. Countries where fertility rates have been in sustained decline and 45 to 60 percent of the population is younger than age 30 are classified as having a transitional age structure. When fertility rates reach two children per woman or below, countries have a mature age structure, with 45 percent or less of the population younger than age 30 and up to 25 percent of the population older than age 60. Because fertility rates in some countries, including South Korea and parts of Eastern Europe, have reached levels near one child per woman, these countries may develop an aged age structure in the coming years, in which one-third or more of the population is older than age 60.[12]

FIGURE 2: Young Age Structures are More Vulnerable to Conflict



Source: Leahy Madsen, E, B Daumerie and K Hardee. 2010. *The Effects of Age Structure on Development.* Washington, DC: Population Action International.

Age Structure and the Risk of Civil Conflict

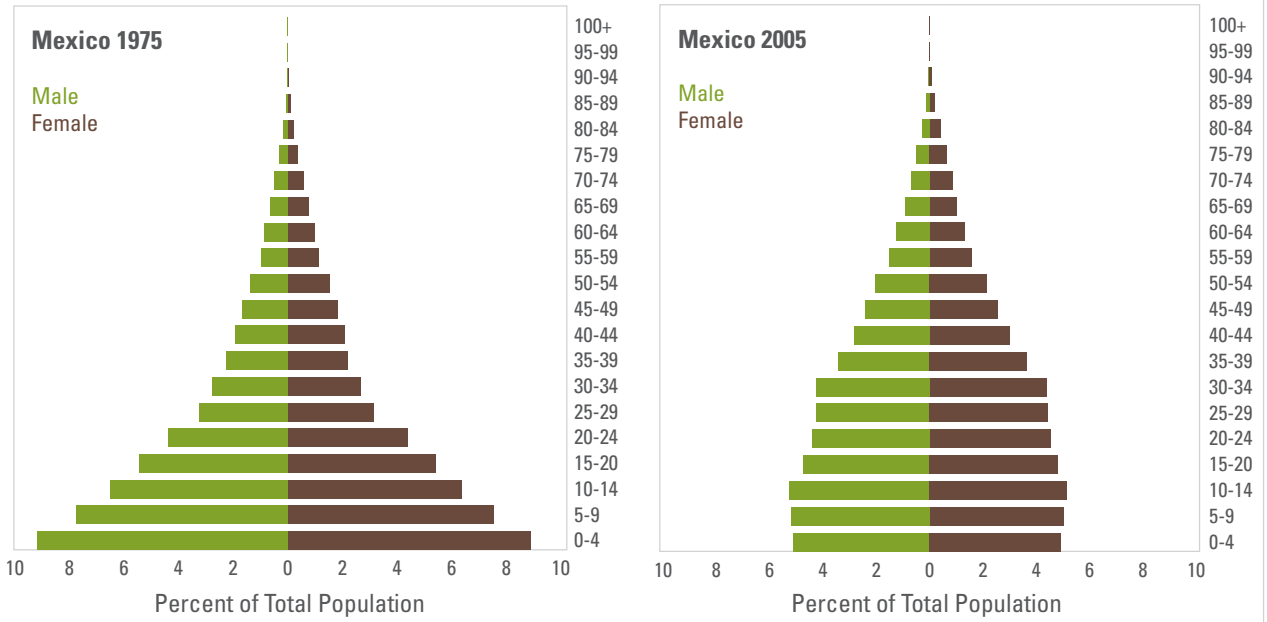
PAI research shows that between 1970 and 2007, 80 percent of all outbreaks of civil conflict occurred in countries with very young and youthful age structures, a group that includes 44 percent of the world's population (Figure 2). Six of the nine outbreaks of new civil conflict between 2000 and 2007 occurred in countries where at least two-thirds of the population is younger than age 30.[13]

Research from the Peace Research Institute Oslo demonstrated that countries with a large youthful population were 1.5 times more likely to experience civil conflict in the second half of the 20th century than those with a more balanced age structure, especially when fertility rates remained high over time.[14] Countries with young age structures are more likely to experience conflict if they also face low rates of secondary education, showing the importance of broader development.[15]

The pattern also holds for measures of governance, including level of democracy, civil liberties and corruption. Between 1970 and 2007, just 13 percent of countries with very young age structures were rated as

The potential for displacement and increased instability associated with civil conflict has a greater impact on vulnerable groups, including women and girls.

FIGURE 3: Mexico's Changing Age Structure, 1975-2005



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

full democracies, while more than 80 percent of countries with mature age structures were rated that way.[16] When countries with youthful age structures do achieve democracy, it is less likely to be sustained.[17]

Policy Considerations

Very young and youthful age structures present opportunities as well as challenges. The outcome depends on a government's capacity and willingness to address demographic factors through policies that strengthen human security. When addressing development in the short term, governments and their partners must prioritize the availability of education, jobs, and health care, including family planning and reproductive health care, for their growing numbers of young people.

Age structure can change over time in response to new policies and government commitments. One example is Mexico, which in the early 1970s had 72 percent of the population younger than 30 and a fertility rate of 6.5 children per woman (Figure 3).[18] At that time, the government launched a large-scale family planning program with widespread distribution of free services. The share of married women using contraception has nearly quintupled, and the share of women who want to delay or prevent pregnancy but are not using contraception has dropped to 12 percent.[19]

The dramatic change in Mexico has not been replicated in sub-Saharan Africa or parts of the Middle East and South Asia, where fertility rates remain high. Large numbers of women who want to avoid pregnancy do not have access to family planning are a major contributor to these rates and, in turn, to sustained very young and youthful age structures. Until family planning is prioritized and women and couples are able to have the number of children they desire, this will not change. In addition to the provision of services, gender barriers such as disempowerment and lower access to education are important drivers of fertility trends.

Reproductive health and family planning services need to be a priority in conflict or post-conflict countries. In Rwanda, for example, the rate of contraceptive use among married women fell by more than two-thirds after the 1994 genocide, due in part to a decimated health system.[20] Yet countries affected by conflict, despite their weakened capacity, receive a smaller share of international assistance for reproductive health than countries with a more stable environment.[21]

Demographic trends and projections are an important part of foreign policy planning. Unlike most other socioeconomic conditions, patterns in age structure can be fairly reliably projected in coming decades based on current levels of fertility, mortality and migration. These projections can help identify countries where population may affect a government's ability to provide human security for its people, increasing the likelihood of conflict and should be considered in larger plans and strategies to address global security and stability.

Endnotes

1 Leahy Madsen, E, B Daumerie and K Hardee. 2010. *The Effects of Age Structure on Development*. Washington, DC: Population Action International.

2 Harbom, L and P Wallensteen. 2009. "Armed Conflicts, 1946—2008." *Journal of Peace Research* 46(4): 577-587.

3 Beebe, SD and M Kaldor. 2010. *The Ultimate Weapon Is No Weapon: Human Security and the New Rules of War and Peace*. New York: PublicAffairs.

4 United Nations Office for the Coordination of Humanitarian Affairs. ND. "Human Security Unit: Overview and Objectives." New York: United Nations Office for the Coordination of Humanitarian Affairs.

5 U.S. Department of Defense. 2010. *Quadrennial Defense Review Report*. http://www.defense.gov/qdr/images/QDR_as_of_12Feb10_1000.pdf; accessed 25 October 2010.

6 Daumerie, B and E Leahy Madsen. 2010. *The Effects of a Very Young Age Structure in Uganda*. Washington, DC: Population Action International.

7 Leahy Madsen, E. 2010. *The Effects of a Very Young Age Structure in Yemen*. Washington, DC: Population Action International.

8 Urdal, H. 2006. "A Clash of Generations? Youth Bulges and Political Violence." *International Studies Quarterly* 50(3): 607-629.

9 National Intelligence Council. 2008. *Global Trends 2025: A Transformed World*. Washington, DC: National Intelligence Council.

10 Center for Strategic & International Studies. 2010. "Gen. William E. Ward, Commander, U.S. Africa Command." http://csis.org/multimedia/audio-military-strategy-forum-gen-william-e-ward-commander-us-africa-command. Accessed 19 January 2011.

11 United Nations Population Division. 2009. *World Population Prospects: The 2008 Revision*. New York: UN Population Division.

12 Leahy, E, R Engelman, C Gibb Vogel, S Haddock and T Preston. 2007. *The Shape of Things to Come: Why Age Structure Matters for a Safer, More Equitable World*. Washington, DC: Population Action International.

13 Leahy Madsen, Daumerie and Hardee 2010.

14 Urdal. 2006.

15 Barakat, B and H Urdal. 2009. "Breaking the Waves? Does Education Mediate the Relationship Between Youth Bulges and Political Violence?" *Policy Research Working Paper Series* 5114. Washington, DC: World Bank.

16 Leahy Madsen, Daumerie and Hardee. 2010.

17 Cincotta, R. 2009. "Half a Chance: Youth Bulges and Transitions to Liberal Democracy." *Environmental Change and Security Program Report* 13:10-18.

18 UN Population Division. 2009.

19 Consejo Nacional de Población (CONAPO). 2009. "35 Años de Planificación Familiar en México." *La Situación Demográfica de México 2009*. Mexico City: CONAPO.

20 Solo, J. 2008. *Family Planning in Rwanda: How a Taboo Topic Became Priority Number One*. Chapel Hill: IntraHealth International.

21 Patel, P, B Roberts, S Guy, L Lee-Jones and L Conteh. 2009. "Tracking Official Development Assistance for Reproductive Health in Conflict-Affected Countries." *PLoS Medicine* 6(6).

WHY POPULATION MATTERS TO
FOOD SECURITY

WHY POPULATION MATTERS TO **FOOD SECURITY**

Almost one in seven people around the world are chronically hungry, lacking enough food to be healthy and lead active lives. This is despite the fact that enough food exists for all of the world's people.[1] Agricultural policies, the prices of certain food commodities such as meat and grain and economic development hugely impact food security, but demographic trends also play a role.

Increasing numbers of people often drive up demand for food, which typically results in additional use of arable land and water. This is especially true in the absence of adequate food production technology and integrated programs that simultaneously address community needs for food and reproductive health. The Food and Agriculture Organization (FAO) projects that by 2050, population and economic growth will result in a doubling of demand for food globally.[2] Addressing the health needs of families in the developing world, including through increased access to family planning, can help slow rapid population growth, improve the health of families and enhance their food security.

Fisheries are an important food source for many communities and are increasingly susceptible to the pressure of population growth.

The State of Food Security

The FAO defines food security as: "When all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life."[3] Nearly one billion people are undernourished, hungry, and living without adequate daily calories. The people most severely affected by food crises are those already living in poverty.[4] The number of undernourished people in the world was projected to decline in 2010 as the global economy revived following the 2008 financial crisis, but 16 percent of the population in developing countries remains undernourished (Figure 1). Seven countries account for two-thirds of the world's undernourished population: Bangladesh, China, the Democratic Republic of Congo, Ethiopia, India, Indonesia and Pakistan.[5]

Additionally, the impacts of climate change on temperature, precipitation, and agricultural productivity are likely to diminish food security in some places. Recent research suggests that climate change will have major negative impacts on staple crops—especially in Asia and Africa, where widespread hunger is greatest.[6]

Overall demand for food is affected by population growth, while economic development and rising incomes tend to shift diets toward meat and animal products that are more expensive and resource-intensive to produce.[7] Meanwhile, food prices are driven by the prices of key agricultural commodities such as meat and grain, stocks of agricultural stores, energy prices, crop failures, demand for biofuels and agricultural trade policies.[8] Although prices for major agricultural commodities—including vegetable oils, grain, dairy products and rice—declined somewhat following peaks in 2008, they have risen quickly, compounding the challenges of chronic food insecurity.[9] The food supply is also affected by high prices for energy, such as petroleum, which raise prices throughout the supply chain and, in turn, increase consumers' costs.[10]

Fisheries are also important food sources, particularly for many poor people in developing countries. In some low-income countries, fish comprises 19 percent of animal protein consumption overall.[11] Fisheries and aquaculture also contribute to economic growth and human welfare in many countries, since millions of people around the world depend on them for their livelihoods.

The 2009 World Summit on Food Security noted that low-income households, women, and farmers with small holdings can face unequal access to food supplies and markets.[12] Women and children, particularly pregnant and breastfeeding women and infants, are often the most severely affected by a lack of food. Pregnant and breastfeeding women require 300 to 500 extra calories each day,

requirements that are difficult to meet in situations of food insecurity.[13] An estimated 17 million infants are born underweight each year, a risk factor that contributes to more than half of all newborn deaths.[14]

Further, when food is scarce, mothers often sacrifice food for their children. In some places male children receive a larger share of available food than their female siblings.[15] Children are also particularly vulnerable because they are still developing, and childhood malnutrition has lifelong implications in terms of productivity, premature death and disability.[16] While women are the primary guarantors of food security for their children, their agricultural work is often unpaid, and laws and customs can limit their rights to land ownership or access to credit.[17]

One of the targets of Millennium Development Goal 1 is to "halve, between 1990 and 2015, the proportion of people who suffer from hunger."[18] The FAO Rome Declaration on World Food Security formulated at the 1996 World Food Summit aims to "eradicate hunger in all countries, with an immediate view to reducing the number of undernourished people to half their present level no later than 2015."[19] Progress towards the MDG1 target is slow, with the share of undernourished people in the developing world declining from 20 percent in 1990 to 16 percent in 2007.[20] However, the percent of official development assistance dedicated towards agriculture decreased dramatically from 18 percent in 1979 to 5.5 percent in 2004,[21] while the number of hungry people in the world has remained high.

Links between Population and Food Security

Most of the countries with the highest numbers of people facing food insecurity also have high fertility rates and rapid population growth. This increases the challenge of adequately meeting nutritional needs. Sub-Saharan Africa has the highest population growth rate in the world. By 2050, even if fertility rates decline, the population of the region is projected to more than double. This area also holds the largest proportion of food-insecure people, with one in four people undernourished.[22] Sub-Saharan Africa also has the lowest agricultural productivity in the world and the highest percentage of people living in poverty.[23]

Food production depends on croplands and water supply, which are under strain as human populations increase. Pressure on limited land resources, driven in part by population growth, can mean expansion of cropland. This often involves destruction of vital forest resources or overexploitation of arable land.

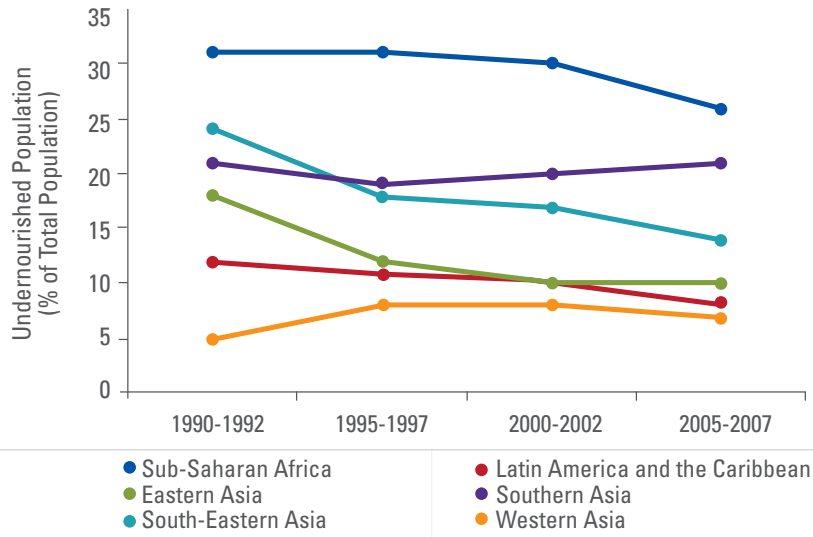
Globally, the world is becoming more urban. Although urban residents have access to a wider array of foods, without land to farm, their food security is dependent on their income and ability to purchase food products.[24] Poor families in urban areas spend up to 60 percent of their budget on food, and low incomes combined with high prices can increase their risk of hunger and malnutrition.[25]

Population pressures in coastal areas are also affecting food security in countries where there is a high dependence on fisheries for protein. In the Philippines, for example, recent research has shown that human pressures, including population growth, have adversely affected the productivity of municipal fisheries. These fisheries had previously provided up to 80 percent of dietary protein for inhabitants in rural coastal areas, and are now on the decline.[26] At the same time, global fish consumption has been increasing, both in aggregate and per capita terms. According to fishery experts, consumption of fish has doubled since 1973, with the developing world accounting for nearly all of this growth.[27] Globally, the rates of growth in fish capture and aquaculture have slowed, raising concerns about the future supply of fish for human consumption.[28]

Policy Considerations

Short term solutions to food insecurity include social protection programs such

FIGURE 1: Hunger Rates Have Declined in Many Regions But Stagnated in Others



Source: Food and Agriculture Organization of the United Nations (FAO). 2010. "Food Security Statistics: Prevalence of Undernourishment in Total Population." FAO. http://www.fao.org/economic/ess/food-security-statistics/en/. Accessed January 6, 2011.

as food aid, both in emergencies and long-term provision of supplies to those hardest hit by hunger. However, food aid without simultaneous developments in local agriculture sectors does not provide a sustainable solution to food insecurity. Increasing agricultural productivity in developing countries, for example through the development of drought-resistant crops and soils, will be a key factor in meeting food demands. Investment in rural infrastructure such as roads, irrigation, and storage facilities could support efforts towards increased agricultural productivity. These investments, if made, could also have serious environmental consequences. Thus, investment in sustainable technologies able to support increased agricultural intensity will be crucial for both meeting the demands of a growing population and adapting to environments increasingly affected by climate change.[29]

Increased production of food alone will not solve the world's food security problem.[30] Projections from the International Food Policy and Research Institute (IFPRI) suggest that slower population growth could significantly lower malnutrition along with increased agricultural productivity, economic growth and investment in health and education.[31] Because population trends will continue to affect the demand for food for decades to come, it is important that demographic projections be incorporated into plans to improve agricultural production and achieve greater food security.

Mid-term solutions include developing integrated development approaches that could simultaneously address both population factors and food security. Programs in the Philippines, for example, have demonstrated that it is possible to improve food security by increasing access to contraception while providing opportunities for women to be community leaders and stewards of fishery resources. [32] These projects are increasing fisheries production and improving the lives of women at a higher rate—and at a lower cost—than if these programs addressed these issues separately.

An estimated 215 million women in the developing world want to avoid pregnancy but lack modern contraception. Increasing access to voluntary family planning would improve women's and children's health. It would also allow couples to plan and space childbearing, enhancing their ability to provide enough food for their families. Investments in international family planning and reproductive health can improve families' well-being at the household level, while helping to slow population growth in areas most affected by food insecurity.

Endnotes

1 World Bank. 2007. *World Development Report 2008: Agriculture for Development*. Washington, DC: World Bank; Blas, J. 2009. "Number of Chronically Hungry Tops 1bn." *Financial Times*, 26 March; Food and Agriculture Organization of the United Nations (FAO). 2008. *The State of Food Insecurity in the World 2008*. Rome: FAO.

2 Ibid.

3 Food and Agricultural Organization of the United Nations (FAO). 2010. *The State of Food Insecurity in the World 2010*. Rome: FAO.

4 FAO. 2010. *The State of Food Insecurity in the World 2010*; World Bank. 2007; World Bank. 2008. *Rising Food and Fuel Prices: Addressing the Risks to Future Generations*. Washington, DC: World Bank.

5 FAO. 2010. *The State of Food Insecurity in the World 2010*.

6 Lobell, DB, MB Burke, C Tebaldi, MD Mastrandrea, WP Falcon and RL Naylor. 2008. "Prioritizing Climate Change Adaptation Needs for Food Security in 2030." *Science* 319: 607-10.

7 FAO. 2010. "Challenges for a Wealthier World: Meat for All?" http://www.fao.org/ag/againfo/home/en/news_archive/2010_meat_for_all.html. Accessed 8 March 2011.

8 FAO. 2008.

9 FAO. 2010. *The State of Food Insecurity in the World 2010*.

10 International Monetary Fund (IMF). 2010. "Impact of High Food and Fuel Prices on Developing Countries." IMF. http://www.imf.org/external/np/exr/faq/ffpfaqs.htm. Accessed 6 January 2011.

11 Food and Agriculture Organization of the United Nations (FAO). 2009. *The State of World Fisheries and Aquaculture 2008*. Rome : FAO.

12 Food and Agriculture Organization of the United Nations (FAO). 2009. *Declaration of the World Summit on Food Security*. http://www.fao.org/fileadmin/templates/wsfs/Summit/Docs/Final_Declaration/WSFS09_Declaration.pdf. Accessed 8 March 2011.

13 United Nations Children's Fund (UNICEF). 2008. *The State of the World's Children 2009*. New York, NY: UNICEF.

14 Food and Agriculture Organization of the United Nations (FAO). ND. "Who Are the Hungry?" http://www.wfp.org/hunger/who-are. Accessed 8 March 2011; UNICEF 2008.

15 World Bank. 2008.

16 Pelletier, DL, EA Frongillo, DG Schroeder and JP Habicht. 1995. "The Effects of Malnutrition on Child Mortality in Developing Countries." *Bulletin of the World Health Organization* 73(4): 443-448.

17 International Center for Research on Women. ND. "Agriculture and Food Security." http://www.icrw.org/what-we-do/agriculture-food-security. Accessed 6 January 2011.

18 United Nations Statistics Division. ND. "Official List of MDG Indicators." New York, NY: UN.

19 Food and Agriculture Organization of the United Nations (FAO). 1996. *Rome Declaration on World Food Security*. Rome: FAO. http://www.fao.org/WFS/index_en.htm. Accessed 23 January 2009.

20 United Nations. 2010. *The Millennium Development Goals Report 2010*. New York: United Nations.

21 Food and Agriculture Organization of the United Nations (FAO). ND. "FAO Investment Center: Increased Agricultural Investment is Critical to Fighting Hunger." http://www.fao.org/tc/tci/whyinvestinagricultureandru/en/. Accessed 6 January 2011.

22 United Nations Population Division. 2009. *World Population Prospects: The 2008 Revision*. New York: UN Population Division.; FAO. 2010. "Food Security Statistics: Prevalence of Undernourishment in Total Population." http://www.fao.org/economic/ess/food-security-statistics/en/. Accessed 6 January 2011.

23 World Bank 2007; Chen, S and M Ravallion. 2008. *The Developing World is Poorer Than We Thought, But No Less Successful in the Fight against Poverty*. Washington, DC: The World Bank.

24 Food and Agriculture Organization of the United Nations (FAO). 2010. "The Impact of Global Change and Urbanization on Household Food Security, Nutrition and Food Safety." http://www.fao.org/ag/agn/nutrition/national_urbanization_en.stm. Accessed 8 March 2011.

25 United Nations Development Programme (UNDP), United Nations Population Fund (UNFPA), United Nations Children's Fund (UNICEF) and United Nations World Food Programme (WFP). 2009. "Agenda Item 1: Population Growth and Rapid Urbanization: Food Insecurity on the Rise in Urban Settings." UNDP, UNFPA, UNICEF, and WFP. http://www.unicef.org/about/execboard/files/B-8713E-JMB_Jan_09_-_population_growth.pdf. Accessed 8 March 2011.

26 Castro J and L D'Agnes. 2008. "Fishing for Families: Reproductive Health and Integrated Coastal Management in the Philippines" *Focus*. Washington, DC: Woodrow Wilson Center.

27 Delgado C.L, N. Wada, M.W Rosegrant, S. Meijer, and M. Ahmed. 2003. *Fish to 2020: Supply and Demand in Changing Global Markets*. Washington, D.C and Penang: International Food Policy Research Institute (IFPRI) and WorldFish Center.

28 FAO. 2009. *The State of World Fisheries and Aquaculture 2008*.

29 FAO. 2008.

30 United Kingdom Department for International Development. 2004. Agriculture, Hunger and Food Security. http://dfid-agriculture-consultation.nri.org/summaries/wp7.pdf. Accessed 29 January 2009.

31 Rosegrant, MW, MS Paisner, S Meijer and J Witcover. 2001. "2020 Global Food Outlook." Washington, DC: International Food Policy Research Institute.

32 Castro and D'Agnes. 2008.

WHY POPULATION MATTERS TO
CLIMATE CHANGE

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]

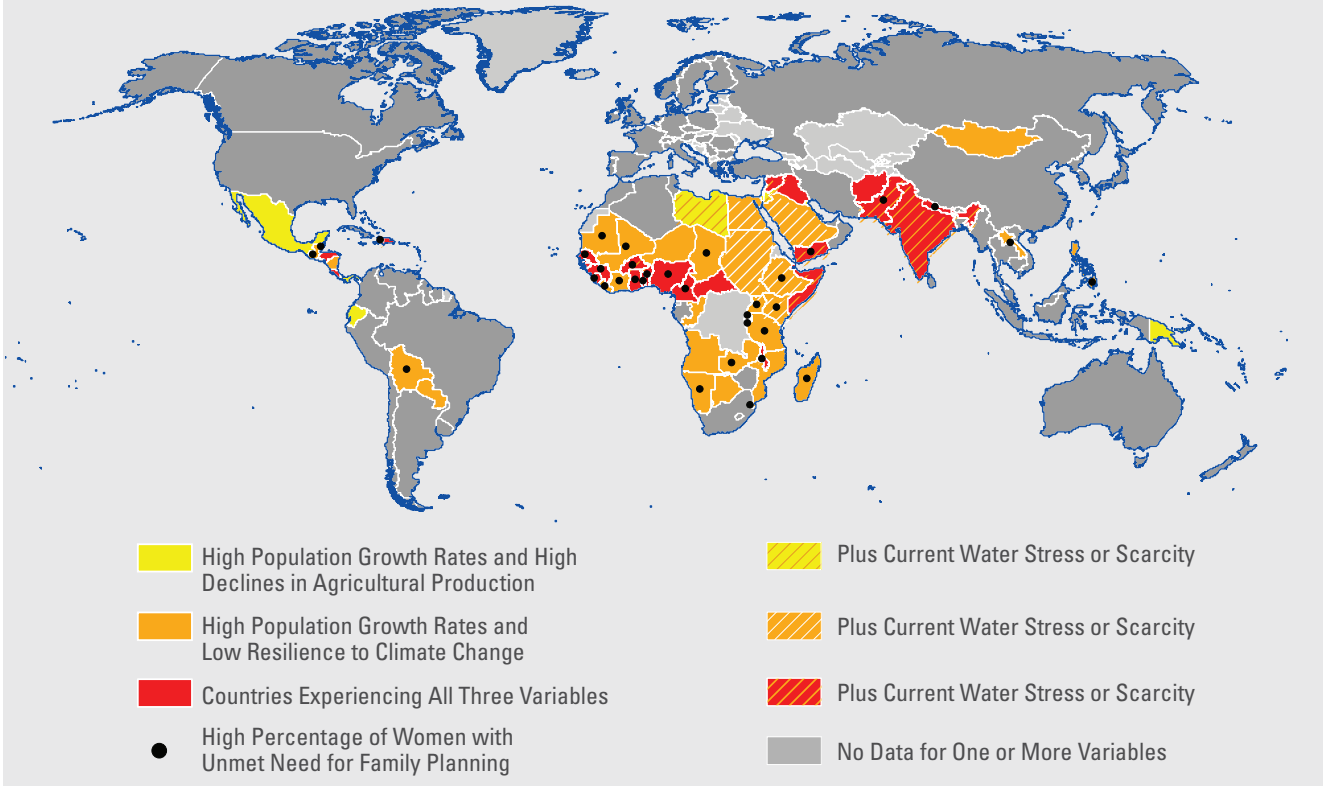
Population Action International's interactive online database, *Mapping Population and Climate Change*, indicates 26 population and climate change "hotspots." These are countries with a low climate change resilience rating that are experiencing rapid population growth and high projected declines in agricultural 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

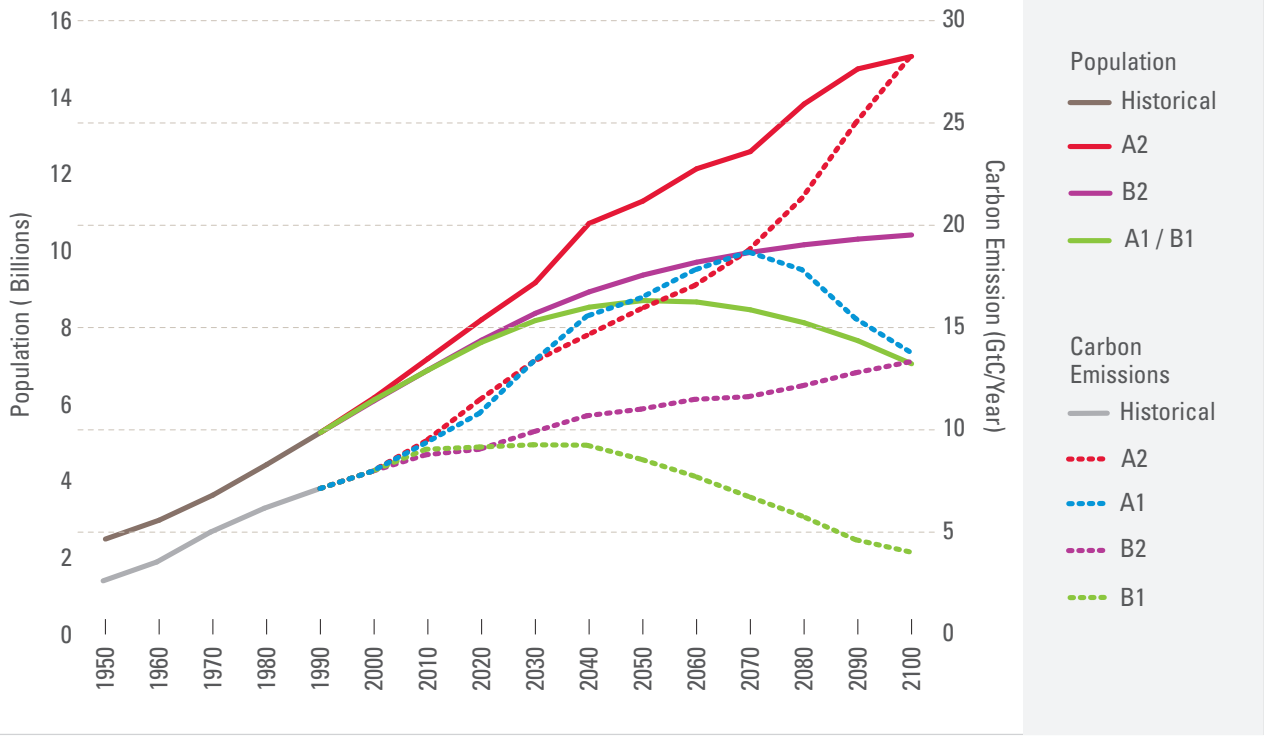
Figure 1: Population and Climate Change Hotspots

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).

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]

Links between 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.[18]

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.[19] 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.[20] 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.[21] The emissions reductions that could be expected through meeting these family planning needs would be roughly equivalent to the reductions that would come from ending all tropical deforestation.[22]

By the end of the century, the effect of slower population growth on emissions would be even greater, reducing emissions by 37 to 41 percent.[23] Compared with the technological investments needed to reduce greenhouse gas emissions globally,[24] the cost of meeting existing demand for family planning in the United States and developing countries is modest,

ranging from $3.6 billion to $4.6 billion annually. Of that, the United States' fair share would be $1 billion.[25] According to a recent study, emissions averted through investments in family planning would cost about $4.50 per ton of carbon dioxide, compared with more expensive options such as solar power ($30 per ton) or carbon capture and storage from new coal plants ($60 per ton).[26]

Policy Considerations

Meeting women's needs for family planning would reduce fertility rates and slow population growth,[27] slowing the growth of greenhouse gases and easing challenges of coping with climate change impacts over the long-term. Addressing needs for reproductive health and family planning can also strengthen household and community resilience to climate change in the near-term.

Decision makers engaged in crafting climate change policy responses at local, national, and international levels should assess population trends and their interactions with efforts to mitigate and adapt to climate change. Global institutions that support and promote climate change adaptation and low-carbon development strategies can be strengthened through the inclusion of population factors in determining priorities for investment; likewise, national climate and development plans will be stronger when population trends are taken into consideration. Efforts to expand access to family planning and promote gender equity can be integrated into broader strategies and community-based activities that contribute to low-carbon and climate-resilient development, and can make a significant contribution toward climate change goals.

Mass displacement due to natural disasters is one of the many ways climate change can impact low-resilience communities.

High population density on coastlines and in low-elevation zones can expose more people to the impacts of floods and sea level rise.

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'Aptation (PANA)*. 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 Nauclér, 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.

WHY POPULATION MATTERS TO
WATER RESOURCES

WHY POPULATION MATTERS TO **WATER RESOURCES**

Water is a key element of life for everyone on Earth. As the world's population grows, the demand for water mounts and pressure on finite water resources intensifies. Climate change, which is also closely tied to population growth, will also lead to greater pressures on the availability of water resources.

The exact number of people living on Earth in the coming decades is uncertain, but we do know that the population will continue growing, and this will impact water availability. Investing in efforts that slow the rates of population growth through increasing access to voluntary family planning services can help ensure that ample water is available for global food production, ecosystem health, and political and social stability.

The State of Water Resources

Water may seem abundant, but less than one percent of the world's water can be used for human needs.[1] This amount has to be shared by many competing users. Stress on freshwater resources due to rising demand is already leading to water scarcity in many places. Water scarcity is measured in various ways, including per capita availability and percentage of water resources used. While political, social, and economic factors all help determine access to water, measures of physical water availability offer a starting point to assess current and future water scarcity.

One of the most commonly used measures of water availability is the per capita freshwater availability within national boundaries. The total number of people living in a country determines the per capita availability of water resources in that country. As a general benchmark, countries can be classified as *water scarce* if there are fewer than 1,000 cubic meters of renewable freshwater available per person per year, and as *water stressed* if there are between 1,000 and 1,667 cubic meters available per person per year.[2]

Approximately 2 billion people are currently living in areas faced with water stress or scarcity.

TABLE 1: Population Pressures on the Top Water-Scarce Areas of the World

Country	Population 2010 (Thousands)	Projected population 2035 (Thousands)	Per capita water availability 2035 (m^3/person/yr)[7]
Kuwait	2,737	4,328	4.6
United Arab Emirates	7,512	11,042	13.6
Qatar	1,759	2,451	21.6
The Bahamas	343	426	46.9
Saudi Arabia	27,448	40,444	59.3
Bahrain	1,262	1,711	67.8
Libya	6,355	8,081	74.3
Maldives	316	392	76.6
Yemen	24,053	46,196	88.8
Singapore	5,086	6,098	98.4

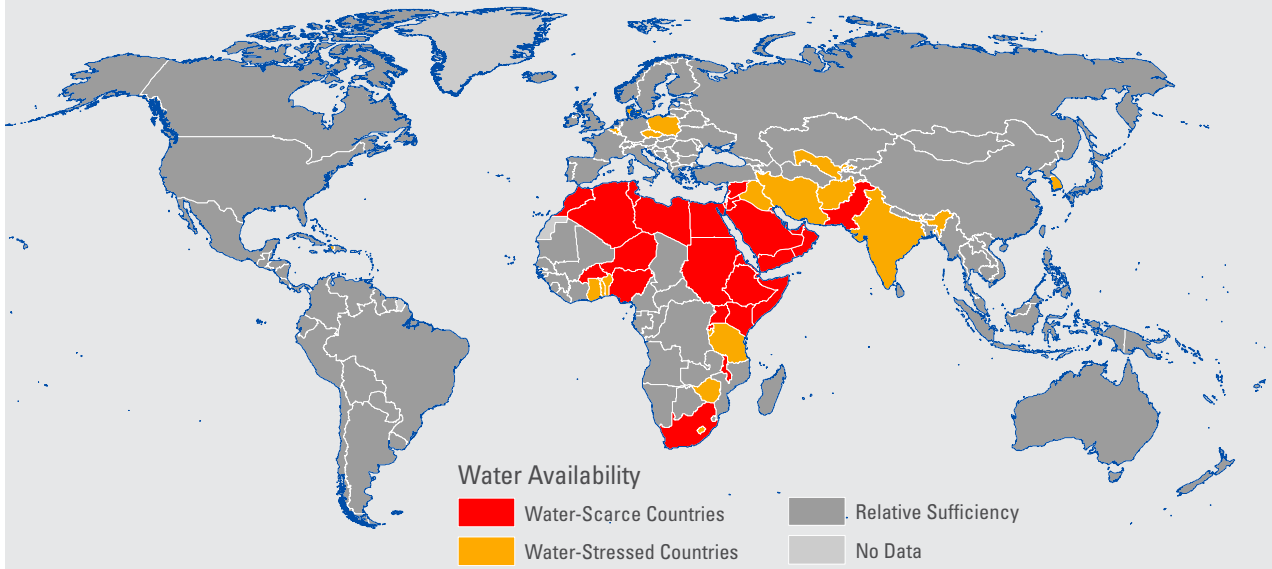
Source: United Nations Population Division. 2011. *World Population Prospects: The 2010 Revision.* New York: UN Population Division.; Food and Agriculture Organization of the United Nations (FAO). 2011. *Information System on Water and Agriculture.* Rome: FAO.

Water scarcity affects all social and economic sectors and threatens the health of ecosystems.

Links between Population and Water

Population growth is a major contributor to water scarcity. Growth in populations means mounting demand and competition for water for domestic, industrial, and municipal uses. Water is also needed for agriculture and industrial use, and for the evacuation of waste materials. The most water scarce or stressed areas are typically those with few water resources, high population densities, and high population growth rates.[3] Population growth limits the amount of water available per person, drives people into marginal regions—which are already water stressed—and also into cities. For instance, most of the countries in the Middle East and North Africa (MENA) region cannot meet their current water demand. Seven of the world's 10 water scarce countries are in the MENA region [4] (Table 1). With per capita water availability

Figure 1: Population Growth Impacts Water-Scarce and Water-Stressed Countries
Data on the amount of total renewable freshwater available in each country (2008-2012) is from the Food and Agriculture Organization of the United Nations. Total renewable freshwater includes the amount of both internal and external renewable water available to a country. This value is then divided by 2010 population figures provided by the United Nations Population Division to produce a per capita rate.



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

projected to fall by half by 2050, the situation is likely to be dire in the coming years.[5] Projections show that by 2035, 3.6 billion people will be living in areas with water stress or scarcity, as population growth causes more countries and regions to become water scarce[6]. The path of future population growth will impact water stress and scarcity (Figure 1). This path will largely depend on the choices that men and women make today about the size of their families, and the family planning services that are available to them as they make these choices.

Agriculture accounts for approximately 70 percent of global water use, and for as much as 95 percent of water use in predominantly agriculture-based countries. Agriculture not only requires a large amount of water, but it is also one of the most inefficient uses of water.[8] A growing population requires more food. More water is needed to produce that food. Agricultural productivity is a crucial component of global food security and, therefore, water scarcity and hunger are closely interrelated. Population growth, along with development, will double global food demand by 2050. This will require increased agricultural production and put increased pressure on water resources.[9]

The majority of the world's population growth in the next 40 years will be absorbed by urban areas, particularly in less developed regions.[10] Urbanization leads to increased pressure on water sources as individuals become more concentrated in one area. Further, increases in per capita water consumption driven by development intensify water demand and strain local water capacity.[11] Although water withdrawals for domestic and municipal use globally account for a modest part of total water use, they are growing rapidly, especially as a result of population growth in urban areas of developing countries.[12]

Access to improved water sources is vitally important to improved health and development for women and communities worldwide.

Industrial production depends on water for processing, cooling, and disposal of waste products. Demand for water for industrial use is increasing with rapid industrialization to meet the many needs of a growing population. Population growth contributes to that increase, but income growth and the changes in consumption play a larger role.[13]

At the household level, demand for water is determined by demographic factors including household size, composition, and age structure. Population growth leads directly to increases in overall water demand, while other demographic factors such as population distribution and age structure modify the pattern in demand and determine increases in household water demand. Overall, the amount of water each person uses is expected to increase as incomes grow and consumption increases.[14]

Rapid population growth and urbanization could expose more people to water shortages, with negative implications for livelihoods, health, and security. These demographic trends, coupled with increasing per-capita water consumption, will be a huge development challenge.[15] Declining water availability in some areas due to climate change will exacerbate this challenge.[16] The rate of unmet need for family planning in most of these countries is very high, meaning many women would like to avoid pregnancy but are not using modern contraception.

Women, in particular, will be most affected by these additional burdens. Women and girls in developing countries are largely responsible for obtaining family water supplies and may have to walk long distances to reach a water source. Women are also mainly responsible for household hygiene and nursing sick children, who frequently become ill with diarrheal disease without clean water. Girls may be pulled out of school to help fetch water when it is not readily available at a nearby source, negatively affecting their educational opportunities. A lack of clean water and sanitation facilities exacerbates an already vicious poverty cycle by robbing girls of educational opportunities, causing disease and malnutrition, and ultimately reducing lifelong productivity.[17]

Policy Considerations

Population growth, along with rising incomes, changing dietary patterns, urbanization and industrial development, will increase demand for a fixed supply of water. Water demand patterns of the future will be characterized by growing competition between sectors, especially in developing countries, where population growth rates are high.

Strategies for efficient and sustainable development and management of water resources are needed to ensure access to the world's limited water resources and to cope with competing demands. Policymakers need to address systemic barriers that inhibit water access, such as poverty. Institutional reforms that enhance water access, like expansion of infrastructure and investments in water management and distribution, are key policy interventions. Other critical water sector approaches include investments in personnel and good governance systems.

Slowing population growth rates can also be an effective strategy for achieving universal access to clean and safe water resources. The challenge of a rapidly growing population on the efforts to provide adequate and clean water to every citizen has been acknowledged in various policy and planning documents. However, this recognition needs to be translated to implementation of programs and projects that directly address the identified challenge.

An estimated 215 million women in developing countries want to avoid pregnancy but are not using modern contraception. Increasing access to voluntary family planning services can help slow population growth, and complement ongoing efforts to ensure adequate and clean water for all.

Endnotes

1 United Nations Development Programme (UNDP). 2006. *Human Development Report 2006: Beyond Scarcity: Power, Poverty and the Global Water Crisis*. New York, NY: UNDP.

2 Falkenmark, M and C Widstrand. 1992. "Population and Water Resources: a Delicate Balance." *Population Bulletin* (47) 3: 1-36.

3 United Nations (UN)-Water and Food and Agriculture Organization of the United Nations (FAO). 2007. *Coping with Water Scarcity: Challenge of the Twenty-First Century*. New York, NY: UN-Water and FAO.

4 PAI analysis with updated data based on Engelman, R. et al. 2000. *People in the Balance: Population and Natural Resources at the Turn of the Millennium*. Washington, DC: Population Action International.

5 World Bank. 2007. *Making the Most of Scarcity: Accountability for Better Water Management Results in the Middle East and North Africa*. Washington, DC: World Bank.

6 Population Action International (PAI). 2004. *People in the Balance Update 2004: Population and Natural Resources at the Turn of the Millennium*. Washington, DC: PAI.

7 PAI analysis with updated data based on Population Action International (PAI). 2000. *People in the Balance: Population and Natural Resources at the Turn of the Millennium*. Washington, DC: PAI.

8 UN-Water and FAO. 2007.

9 Food and Agriculture Organization of the United Nations (FAO). 2008. *State of Food Insecurity in the World 2008: High Food Prices and Food Security—Threats and Opportunities*. Rome: FAO.

10 United Nations Population Division. 2010. *World Urbanization Prospect: The 2009 Revision*. New York: UN Population Division.

11 United Nations Population Division and Food and Agriculture Organization of the United Nations (FAO). 1994. *Population and Water Resources*. UN Population Division and FAO. http://www.un.org/popin/fao/water.html. Accessed 04 April 2010.

12 UNDP. 2006.

13 UN Population Division and FAO. 1994.

14 UN-Water and FAO. 2007.

15 Bates, B.C., Z.W. Kundzewicz, S. Wu and J.P. Palutikof, Eds.,. 2008. *Climate Change and Water: Technical Paper of the Intergovernmental Panel on Climate Change*. Geneva: IPCC.

16 UN-Water and FAO. 2007.

17 World Health Organization (WHO) and United Nations Children's Fund (UNICEF). 2005. *Water for Life: Making it Happen*. Geneva: WHO and UNICEF.

WHY POPULATION MATTERS TO FORESTS

WHY POPULATION MATTERS TO **FORESTS**

Deforestation threatens the well-being and livelihoods of millions of people who heavily depend on forest resources. It is particularly devastating for women and children in poor rural communities. Yet deforestation is occurring at alarmingly high rates, especially in areas of the world that have high levels of population growth. Providing men and women with family planning to achieve their desires for smaller family sizes is a priority that will address forest decline and empower families.

The State of Forests

Forests cover one-third of the world's total land area, representing an area of more than 4 billion hectares in 2010. This represents 0.6 hectares per person, or about a soccer field for each person if forests were divided equally among the population.[1] There is wide variation in the global, regional and local distribution of forests. Five countries (the Russian Federation, Brazil, Canada, the United States of America, and China), with a combined population of around 2 billion people account for more than fifty percent of the total forest area of the world. A similar number of people live in more than 60 countries which have forests on less than 10 percent of their land area.[2]

Forest resources contribute greatly to the economic and social needs of many around the world, with more than 1.6 billion people currently relying on them for their livelihoods. People depend on forests to varying degrees based on a number of factors including proximity. The level of dependence is even greater among some who live inside or close to dense forests. About 60 million people are wholly dependent on forests while more than 350 million people largely depend on these areas for subsistence and income.[3] About 10 million people are employed in forest management and conservation. For all of these people, forest destruction means the loss of livelihoods. The forestry sector contributes greatly to national development goals, and provides more than 8 percent of gross domestic product (GDP) in some developing countries.[4]

Deforestation continues at high rates especially in developing countries, although there are indications of it slowing down at the global level. This loss is mainly occurring through the conversion of forests into agricultural land.[5] Africa and South America recorded the highest net loss of forests between 2000 and 2010. From 1990 to 2010, the top 10 countries with the largest forest loss, had a combined net loss of 7.9 million hectares of forest area per year, an area the size of Panama or the Czech Republic.

Links between Population and Forests

Demographic factors including population growth, density, distribution, migration, and urbanization are important drivers of deforestation. The top 10 countries experiencing the greatest forest loss have large populations, many of which continue to grow rapidly (Table 1). In

TABLE 1: Population Matters to Top 10 Countries with Net Loss of Forest Area

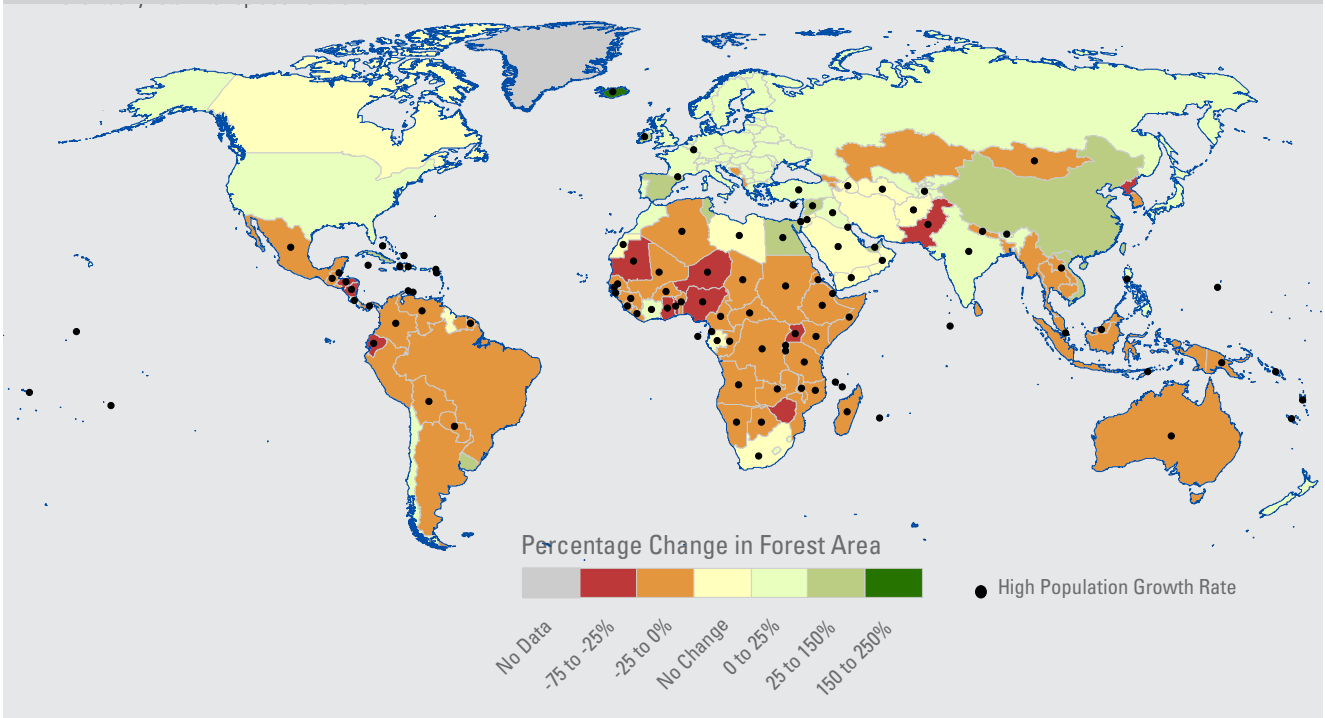
Country	Annual Change of Forest Area, 2000–2010		Population (Millions)		Unmet need for FP
	1,000 ha/yr	%	2010	2050 Projected	
Brazil	-2642	-0.49	194.9	222.8	6.0
Australia	-562	-0.37	22.3	31.4	N.A
Indonesia	-498	-0.51	239.9	293.5	9.1
Nigeria	-410	-3.67	158.4	389.6	20.2
United Republic of Tanzania	-403	-1.13	44.8	138.3	21.8
Zimbabwe	-327	-1.88	12.6	20.6	12.8
Democratic Republic of the Congo	-311	-0.2	66.0	148.5	24.4
Mynamar	-310	-0.93	47.9	55.3	19.1
Bolivia	-290	-0.49	9.9	16.8	20.2
Venezuela	-288	-0.60	28.9	41.8	N.A.
Total	**-6,040**	**-0.53**	**825.6**	**1, 358.6**	

n.a = Data not available

Source: Food and Agricultural Organization of the United Nations (FAO). 2010. Global Forest Resources Assessment 2010. Rome: FAO.; United Nations Population Division. 2009. *World Population Prospects: The 2008 Revision.* New York: UN Population Division.; UN Population Division. 2010. *World Contraceptive Use 2010.* New York: UN Population Division.

Figure 1: High Population Growth Overlaps with High Forest Loss, 1990-2010

Countries with high rates of population growth are those where the population growth rate is above the median of all countries between 2000 and 2005. This group includes all countries where populations were estimated to grow by 1.33 percent annually or more over the period. These maps utilize the medium scenario of the United Nations long-range population projections, which assumes that fertility rates in all countries stabilize at replacement level.[6]



Sources: Food and Agricultural Organization of the United Nations (FAO). 2010. *Global Forest Resources Assessment 2010.* Rome: FAO.; United Nations Population Division. 2009. *World Population Prospects: The 2008 Revision.* New York: UN Population Division.

general, areas of high population growth overlap with those that have experienced high forest loss over the years (Figure 1).

POPULATION GROWTH, DENSITY, AND DISTRIBUTION

Evidence shows that rapid population growth, in combination with other factors, contributes to increasing deforestation.[7] Small frontier farmers, living on the edge of forests, drive much of the developing world's deforestation by cutting down forests for settlement and food production. Growing populations mean increased demand for food, and a corresponding need to convert forests to agricultural land.[8] Land shortages in traditional farming areas result from the combination of several factors—among them a growing number of people, a high population density, and the accumulation of previous population growth.[9]

Most land conversion from natural states to human uses is happening in the developing world, where population growth is most prevalent.[10] In 2002, approximately 47 percent of the Brazilian Amazon was under some type of human pressure, leading to land-use conversion, forest loss and degradation, and rapid changes to the regional landscape.[11] In most developing countries, the highest fertility occurs in remote, sparsely settled regions. These forest frontier areas often have fragile ecosystems, and rapid population growth contributes to land conversion for agricultural use. Although agricultural productivity has generally increased globally, it has hardly kept the pace with population growth. In much of the developing world, population growth has negatively impacted food security.[12]

Increased demand for fuel wood for household consumption is a primary driver of deforestation in the populous regions of East Africa and South Asia.[13] Demand for forest products continues to increase globally, and will continue to increase in line with growth in population and income.[14] In some parts of sub-Saharan Africa with high population densities, the demand for wood has already outpaced local supply. This leads to challenges in access to wood for daily household needs such as cooking and heating.[15] Slow economic growth will impede the switch to non-wood fuels, and the demand for fuel wood is likely to increase with population growth.

Household age and sex composition are also important factors in land use change, as they affect the relative availability of labor for potential forest clearing activities, such as farming and firewood gathering.[16] A youthful age structure, in which a large majority of the population is younger than 30 years, may increase the momentum of a growing population.[17]

MIGRATION AND URBANIZATION

Clearing of forests by migrant families has been generally found to be the primary cause of deforestation, especially in forest frontier areas.[18] Most of these families have moved to the edges of large, relatively intact and undisturbed natural forest, as a result of increasing population densities pushing them out of their former neighborhoods.[19] Evidence shows that as household size increases, the demand for new agricultural land outside the farm grows, causing an increase in deforestation. As individuals reach adulthood and seek their own incomes, they need more land for subsistence crop production. This leads to rural-rural migration and further deforestation.[20]

Recent studies show that while migration has a large impact, urbanization is becoming the most important driver of deforestation in the 21st century.[21] The majority of the world's population is urban and most of future population growth will be absorbed in urban areas. The urban population is high in the developing world, currently at about 80 percent in Latin America and Caribbean. In Africa and Asia, the urban population is expected to grow from around 40 percent to 60 percent by the middle of the century.[22] Evidence points to increased demand for food in urban markets in developing countries and in export markets in both developing and developed countries creating demand that drives deforestation.[23] The demands of urban populations lead to farmland expansion in rural forested areas to produce more crops and livestock, which impact forest conversion for agriculture and lead to deforestation. Diets of people in urban areas are increasingly reliant on meat, which has driven a growing demand for farmland and increased deforestation.[24]

The decisions of individuals, corporations and governments to cut forests could also be influenced by institutional and economic governance policies. Population growth, combined with other direct factors such as poverty, corruption, and weak property rights, contributes to forest loss and severe environmental degradation. Demand for forest and agricultural products to feed growing rural and urban populations will continue to put pressure on forests.

Policy considerations

Efforts to ease pressure on forests and manage them sustainably will require a combination of strategies that address both the direct and underlying causes of forest decline. These approaches include monetary and fiscal policies that reduce prices and demand for agricultural land and forestry products, as well as institutional reforms that address land tenure and property rights to ensure sustainable forest management. They also include measures to slow the rate of population growth, such as improving access to voluntary family planning services and investing in girls' education.

Integrated strategies that address the livelihoods of people living within and outside forests should be encouraged. Such strategies should include population, health and environment programs and aim to empower groups likely to be adversely affected by forest loss, such as women. Fulfilling the needs of the millions of women who want access to contraception would help slow rapid population growth and help women and their families to lead healthier lives. Providing women with a choice to determine their family size through investments in voluntary family planning is one way to help reduce the pressure on forests and empower millions around the world.

Endnotes

1 Food and Agriculture Organization of the United Nations (FAO). 2010. *Global Forest Resources Assessment 2010*. Rome: FAO.
2 FAO. 2010.
3 World Bank. 2004. *Sustaining Forests: A Development Strategy*. Washington DC: World Bank.
4 Food and Agriculture Organization of the United Nations (FAO). 2006. *Global Forest Resources Assessment 2005: Progress Towards Sustainable Forest Management*. Rome: FAO.
5 FAO. 2010.
6 United Nations Population Division. 2009. *World Population Prospects: The 2008 Revision*. New York: UN Population Division.
7 Pan, W, D Carr, A Barbierri, R Bilsborrow and C Suchindran. 2007. "Forest Clearing in the Ecuadorian Amazon: A Study of Patterns Over Space and Time." *Population Research and Policy Review* 26:635-659.
8 Geist, H J and E F Lambin. 2002. "Proximate Causes and Underlying Driving Forces of Tropical Deforestation." *Bioscience* 52(2): 143-150.
9 Rosero-Bixby, L and A Palloni. 1996. "Population and Deforestation in Costa Rica." *CDE Working Paper* No. 96-19. Madison: 1996.
10 Carr, D, L Sutter and A Barbieri. 2006. "Population Dynamics and Tropical Deforestation: State of the Debate and Conceptual Challenges." *Population and Environment* 27:89-113.
11 Barreto, P, C Souza, R Nogueron, A Anderson, R Salamao and J Wiles. 2006. *Human Pressure on the Brazilian Amazon Forests*. Washington DC: World Resources Institute (WRI).
12 Ramankutty, N, JA Foley and NJ Olejniczak. 2002. "People on the Land: Changes in Global Population and Croplands during the 20th Century." *Ambio* 31(3): 251-257.
13 Food and Agriculture Organization of the United Nations (FAO). 2008. *Forests and Energy: Key Issues*. Rome: FAO.
14 FAO. 2010.
15 Millenium Ecosytem Assessment. 2005. *Ecosystems and Human Well-Being Biodiversity Synthesis*. Washington DC: World Resources Institute (WRI).
16 Sherbinin, A, D Carr, S Cassels and L Jiang. 2007. "Population and Environment." *The Annual Review of Environment and Resources* 32: 345-373.
17 Leahy, E, R Englelman, C Vogel, S Haddock and T Preston. 2007. *The Shape of Things to Come*. Washington, DC: PAI.
18 Geist and Lambin. 2002
19 Carr, Sutter and Barbieri. 2006.
20 Carr, Sutter and Barbieri. 2006.
21 DeFries, R, T K Rudel, M Uriarte and M Hansen. 2010. "Deforestation Driven by Urban Population Growth and Agricultural Trade in the Twenty-First Century." *Nature Geoscience* 3: 178-181.; Lambin, E F and P Meyfroidt. 2011. "Global Land Use Change, Economic Globalization, and the Looming Land Scarcity." *Proceedings of the National Academy of Sciences* 108: 3465-3472.
22 United Nations Population Division. 2010. *World Urbanization Prospects: The 2009 Revision*. New York: UN Population Division.
23 DeFries, Rudel, Uriate and Hansen. 2010.
24 Carr, Sutter, and Barbieri. 2006.

WHY POPULATION MATTERS TO
BIODIVERSITY

WHY POPULATION MATTERS TO **BIODIVERSITY**

Human population size, growth, density and migration are underlying causes of biodiversity loss. Global population is projected to grow to anywhere between 8 billion and 11 billion by the middle of the century, with much of the growth expected to take place in the humid tropics whose ecosystems harbor the planet's richest forms of biodiversity. Increased demand for goods and services to meet the needs of a growing population will undoubtedly exert more pressure on the components of biodiversity—ecosystems, genes and species. Slowing population growth will not only ease off pressure on biodiversity, but will also empower women and their families.

The State of Biodiversity

Biodiversity worldwide continues to deteriorate, despite an increase in conservation efforts.[1] The 2010 Biodiversity Target, adopted by the Convention on Biological Diversity (CBD) Conference of the Parties in 2002, has not been met. The target aimed to achieve a significant reduction in biodiversity loss by 2010.[2] The decline in biodiversity is expected to continue in the 21st century.[3]

Biodiversity loss varies among regions, and affects genes, species and ecosystems. Trends in the average size of species vary greatly between regions, according to the Living Planet Index, which monitors abundance of the world's vertebrates and offers insights into which habitats or ecosystems have species that are declining rapidly. The index demonstrates an observed severe and ongoing loss of biodiversity in tropical ecosystems.[4] The Red List Index, which tracks the average extinction risk of species over time,[5] shows a general increase in threats faced by all groups of animals and plants that are at risk of extinction. Some species of birds and mammals used for food and medicine are facing a greater extinction risk. Terrestrial ecosystems, which contain the majority of the world's known plant and animal species, are being rapidly destroyed. The same holds for inland water ecosystems, including wetlands, which have long been declining. Highly valuable marine and coastal ecosystems, including mangroves, seagrass beds, salt marshes and shellfish reefs, continue to be threatened by degradation.[6] Eighty percent of the world's fish stocks have either been fully exploited or overexploited.[7]

Traditional medicines derived from plants are relied upon by a great proportion of populations in developing countries. Herbal medicines are routinely administered at home to more than half of children suffering from common ailments such as fever in several sub-Saharan Africa and Asian countries.[8]

Links between Population and Biodiversity

Population is recognized as an indirect driver of biodiversity loss, as human demands for resources like food and fuel play a key role in driving biodiversity degradation. This happens primarily through the conversion of ecosystems to food production. Household demographic factors, such as household size, have important implications for resource consumption, with rapid increases in household numbers associated with loss in biodiversity.[9]

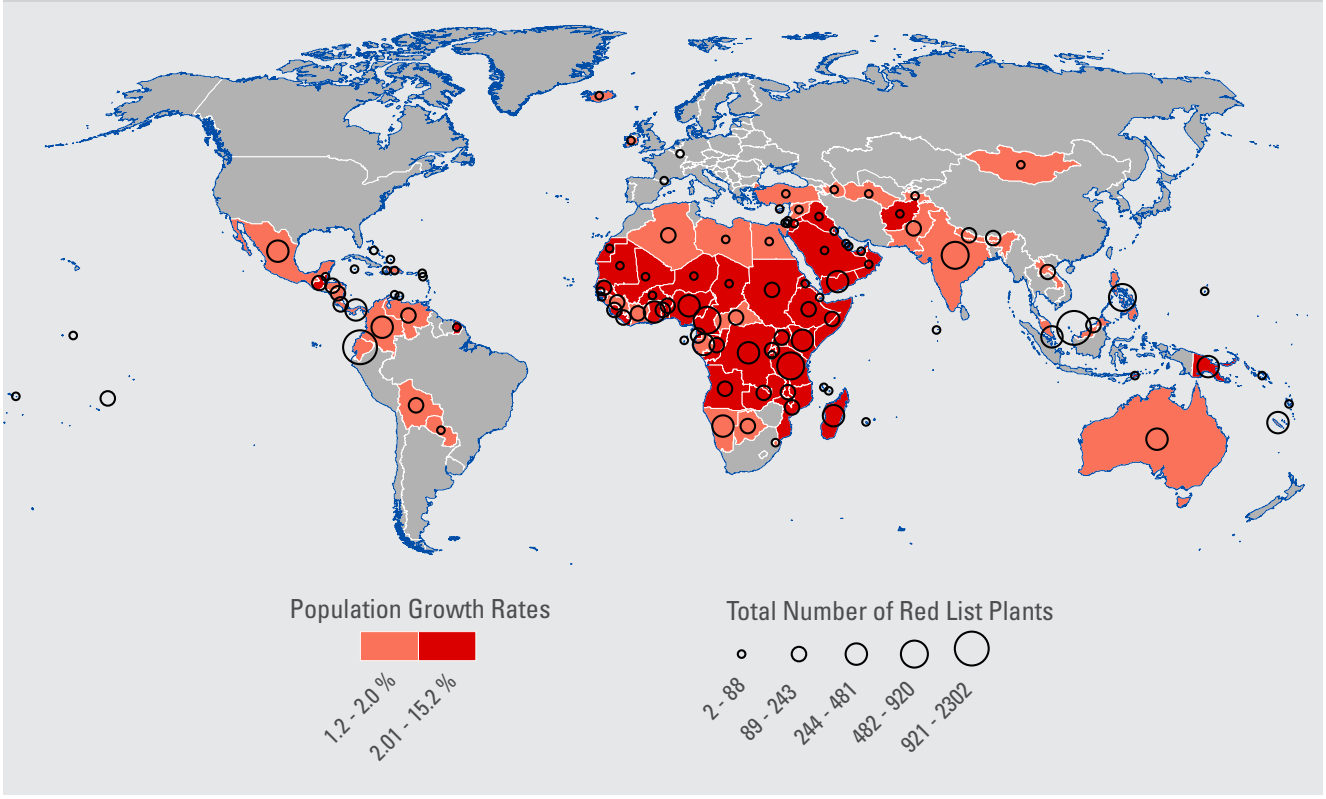
Population size, growth and density are often regarded as important factors in explaining the loss of species.[10] Over-exploitation and habitat loss as a result of population and other pressures is likely to contribute to a high risk of extinction of plants and animals. This is especially true in parts of the world where people are heavily dependent on them for livelihoods. Areas of rapid population growth overlay those with high numbers of threatened and vulnerable plant species (Figure 1).

Habitat loss is generally greatest where population density is highest, and regions rich in endemic species have higher-than-average population densities and population growth rates.[11] This is true in many parts of Asia and Africa where people and threatened species are often concentrated within the same localities.[12] The number of threatened species is likely to rapidly increase in regions where human population growth rates are high, as the demands for resources of a growing population are predicted to increase in these regions.[13]

Habitat loss appears to be the most significant threat to biodiversity, and current trends and projections show that land use is and will remain the most prominent driver of biodiversity and ecosystem deterioration .[14]

According to the Millennium Ecosystem Assessment, major habitats including forests, grasslands and coastal zones have been heavily impacted by human activities leading to degradation.[15]

Figure 1: There is Rapid Population Growth in Areas with Many Vulnerable Species



Sources: United Nations Population Division. 2011. *World Population Prospects: The 2010 Revision.* New York: UN Population Division; Vié, J C, C Hilton-Taylor and S N Stuart. *Wildlife in a Changing World—An Analysis of the 2008 IUCN Red List of Threatened Species.* Gland: International Union for Conservation of Nature (IUCN).

Population growth may contribute to the degradation of ecosystems when wilderness is converted to agricultural land to meet the needs of increasing human populations. Agricultural land expansion is the most dominant driver for habitat loss, which, combined with unsustainable forest management, contributes to the greatest cause of species moving closer towards extinction.[16]

Urbanization is also associated with species loss. With more than half of the world's population now living in urban areas,[17] urban sprawl has led to the disappearance of many habitats. Urbanization spurs consumption, increasing the demand for food and energy and thereby increasing pressures on ecosystems. With the majority of population growth expected to take place in urban areas, there are indications that this pressure on biodiversity will be sustained, if not compounded. Other activities associated with urbanization, such as infrastructure and industrial developments, are also important contributors to habitat loss.[18]

Conversion of habitats, over-exploitation of resources, pollution, and climate change are four drivers which directly lead to biodiversity loss. However, intermediate factors such as population growth can exacerbate the pressures caused by the direct drivers. Continued population growth will interact with the direct drivers to create multiple pressures on biodiversity and ecosystems.

Policy Considerations

A key lesson from the failure of the 2010 Biodiversity Target is the importance of tackling the multiple drivers of biodiversity loss. Policies that break the link between direct and indirect drivers of biodiversity loss, such as mitigating population pressures by providing needed health services, herald the future for effective conservation. New targets, established at the 2010 Convention for Biological Diversity (CBD) in Nagoya, form the framework for biodiversity conservation until 2020.[19] Popularly known as the "Aichi Targets," they aim to halve the loss of natural habitats and expand nature reserves to 17 percent of the world's land area by 2020. The targets recognize the importance of addressing the underlying causes of biodiversity loss across all sectors of government and society.

Factors that determine the demand for natural resources hinder efforts to reduce direct pressures on environmental resources and need to be given greater attention in efforts to conserve biodiversity.[20] Population has been identified as an underlying driver of biodiversity change and deterioration. The most important direct driver of biodiversity loss and deterioration, habitat loss, is influenced by population.

In addition to policies that tackle the direct drivers of biodiversity loss, efforts aimed at slowing human population growth will reduce the pressure on biodiversity and ecosystems by alleviating pressures on land use.

Investments aimed at empowering families to make choices on desired family size are an important component. Millions of women in the regions, countries and communities faced with biodiversity loss have expressed a need for contraception. Fulfilling this demand and expanding access to voluntary family planning will pay dividends for their health and that of the planet.

Endnotes

1 Convention on Biological Diversity (CBD). 2010. *Global Biodiversity Outlook 3*. Montreal: CBD.

2 Convention on Biological Diversity (CBD). 2010. "2010 Biodiversity Target". CBD. http://www.cbd.int/2010-target/

3 Leadley, P, H M Pereira, R Alkemade, J F Fernandez-Manjarres, V Proenca, J P W Scharlemann and M J Walpole. 2010. "Biodiversity Scenarios: Projections of 21st Century Change in Biodiversity and Associated Ecosystem Services." Montreal. *Convention on Biological Diversity Technical Series* No. 50. Montral: CBD.; Pereira, H, P Leadley, V Proença, R Alkemade, J P W Scharlemann, J F Fernandez-Manjarrés, M B Araújo, P Balvanera, R Biggs, W W L Cheung, L Chini, H D Cooper, E L Gilman, S Guénette, G C Hurtt, H P Huntington, G M Mace, T Oberdorff, C Revenga, P Rodrigues, R J Scholes, U R Sumaila, and M Walpole. 2010. "Scenarios for Global Biodiversity in the 21st Century." *Science*. 330 (6010): 1496-1501.

4 CBD. 2010.

5 Vié, J C, C Hilton-Taylor and S N Stuart. *Wildlife in a Changing World—An Analysis of the 2008 IUCN Red List of Threatened Species*. Gland: International Union for Conservation of Nature (IUCN).

6 CBD. 2010.

7 Food and Agriculture Organization of the United Nations (FAO). 2008. *State of Food Insecurity in the World*. Rome: FAO.

8 CBD. 2010

9 Jianguo, L, G C Daily, P R Ehrlich and G W Luck. 2003. "Effects of Household Dynamics on Resource Consumption and Diodiversity." *Nature*: 421.

10 Cincotta and Gorenflo. 2011.; Millenium Ecosytem Assessment (MA). 2005. *Ecosystems and Human Well-Being, Biodiversity Synthesis*. Washington DC: World Resources Institute (WRI).

11 Cincotta, R P and R Engelman. 2000. *Nature's Place: Human Population and the Future of Biological Diversity*. Washington DC: Population Action International.

12 Vié, Hilton-Taylor and Stuart. 2010.

13 Vié, Hilton-Taylor and Stuart. 2010.

14 Vié, Hilton-Taylor and Stuart. 2010.; CBD. 2010.; MA. 2005

15 MA. 2005.

16 Ibid.

17 United Nations Population Division. 2011. *World Population Prospects: The 2010 Revision*. New York: UN Population Division.

18 Cincotta and Gorenflo. 2011.

19 Convention on Biological Diversity (CBD). n.d. "Aichi Targets". http://www.cbd.int/sp/targets/

20 CBD. 2010.

Printed using soy based inks

Population Action
INTERNATIONAL
HEALTHY FAMILIES HEALTHY PLANET

wwww.populationaction.org