

From 6 Billion to 7 Billion

How population growth is changing and challenging our world



POPULATION
INSTITUTE

Introduction

Since 1999 world population has grown from 6 billion to 7 billion. For the fourth time in the past half century, 1 billion people were added to the planet in 14 years or less. But what does that mean for human well-being and the fate of the planet?



Milestones are times for reflection. They provide us with an opportunity for reassessment and recalibration. That applies with special urgency to the 7 billion population mark that will be officially crossed on October 31, 2011. Given the fertility trends indicated by the UN's median variant projection, the world will reach the 8 billion mark by 2024 and the 9 billion mark by 2042, but those numbers are not written in stone. If the U.S. and other donor nations fulfill the commitments made at the 1994

International Conference on Population and Development, the goal of universal access to family planning and other reproductive health services can yet be achieved, and doing so could dramatically lower fertility rates, particularly if the practice of child marriage is abolished, girls are encouraged to stay in school, women are empowered, and the reproductive rights of women are made a reality. But a business-as-usual approach, one that treats these goals as desirable, but not imperative, is doomed to failure.

Unless a greater sense of urgency is brought to gender equity, family planning and reproductive health and rights, the world will reach the 8 billion mark almost before we know it, and many of the advances that we have made in reducing severe poverty and eradicating hunger could be reversed, perhaps dramatically so.

In a world consumed with looming crises, too little focus has been put on how climate change and resource limitations will affect vulnerable populations in the developing world. If the rising food and energy prices and the adverse effects of climate change are here to stay—and it looks as if they are—the implications for the least developed countries is very worrisome. Rapid population growth in those countries will make it difficult, if not impossible, to improve living standards for the poorest of the poor; it might even reverse many of the gains that have already been made.

While human population jumped from 1.6 billion to 6.0 billion between 1900 and 2000, the rapid rate of population growth did not appear to slow the advance of modern civilization. The 20th century, despite two world wars, brought about an exponential leap in both longevity and standards of living. When world population crossed the 6.0 billion mark in October of 1999¹, there was little apparent reason to believe that the march of human progress would be slowed any time soon by population growth. Indeed, chronic hunger and severe poverty were in a prolonged decline, and despite an accelerated rate of resource consumption, commodity prices for minerals and fossil fuels—measured in constant dollars—were at or near historic lows. A rising middle class in Asia spurred hopes that the advance of industrialization would bring prosperity to all. And while there were concerns even then about issues like water scarcity, climate change, biodiversity, and environmental degradation, they were tempered by a widely held belief that technology and human know-how could overcome all obstacles. Moreover, there was a strong conviction that fertility rates would continue a steady descent, and that population growth would level off and decline before these environmental problems could reach a crisis stage.

Confident that we could make major gains in improving the well-being of people in the developing world, in 2000 the United Nations formulated a set of Millennium Development Goals designed to boost educational attainment, reduce mortality, improve health outcomes, lower unemployment, and halve the rate of hunger and



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severe poverty. And thanks to a concerted international effort by both donor and recipient countries, notable progress has been made in several areas, including education and child mortality.

In recent years, however, the rate of progress has slowed and, in some cases, has been reversed by economic downturns, budget cuts, and the rising cost of food and fuel. And, as the effects of climate change and resource depletion become more pronounced, there is mounting concern about the impacts of human activity on resources, climate, the environment, biodiversity, and economic well-being. A growing number of experts caution that current growth patterns are neither environmentally nor economically sustainable, and that hopes for eradicating hunger and severe poverty may be dashed by the effects of climate change, water scarcity, and the rising cost of food and energy.

Chapter 1

From 6 Billion to 7 Billion—What's Different?

Looking at the world today with 7 billion people and looking back to 12 years ago when world population was 6 billion, are there trends or developments that suggest that the hopes of eradicating hunger and severe poverty are in danger of being lost? Is rapid population growth an impediment to improving human welfare in the developing world? If so, what are the warning signs? And what can we realistically expect if world population, as currently projected, increases by another billion in the next 13 years and by 2 billion in the next 31 years?

This report takes a look at some of the key metrics and trends that will determine whether the advance of human progress is halted or even reversed by the excessive demands that we are now placing upon the planet and its resources. It examines how population dynamics, in combination with other factors, is reshaping our world and, in some cases, impeding efforts to improve the welfare of the world's poor. This report also takes a look at how much progress is being made—and lost—in the effort to make universal access to family planning and reproductive health services a reality, not just a right.

Trends do not necessarily indicate what the future holds. As they say on Wall Street, “Past performance does not guarantee future results.” We could do a lot better than recent trends would suggest. Or we could do a whole lot worse. But trends help us to develop a better understanding of our world and the promise and peril that lie ahead. At the very least, current trends suggest that greater investments are needed in agricultural development, water conservation, the education of girls, the empowerment of women, and, most importantly, family planning and reproductive health. Even small investments in these areas could pay large returns, as we seek to eradicate hunger and severe poverty, but time is running out: we need to strike a better balance between the demands we place upon the planet and the Earth’s ability to satisfy our needs.

The World at 6 Billion—How the World looked in 1999

The world was in a different place in 1999 when world population crossed the 6 billion mark. The decade of the 1990s was perhaps the greatest ever for stock prices. After a decade of low commodity prices, rapid economic expansion, and continued gains in reducing hunger and severe poverty, hopes were high that the pace of progress would continue unimpeded by resource limits or environmental restraints.

OIL PRICES WERE AT NEAR RECORD LOWS.

- In March of 1999, just six months before the 6 billion population mark was reached, *The Economist* magazine ran a now infamous cover story declaring that the era of cheap oil was here to stay. With oil prices hovering at around \$10 a barrel, the magazine speculated that oil prices could fall to \$5 a barrel.
- Oil prices actually rose in the second half of 1999, but despite an up-tick in oil prices, international energy experts were confident that oil prices would remain low. In its *World Energy Outlook 2000* forecast, the

International Energy Agency (IEA) projected that oil prices would remain essentially flat, at \$21 a barrel, until 2010, and then rise steadily to \$28 a barrel through 2020.

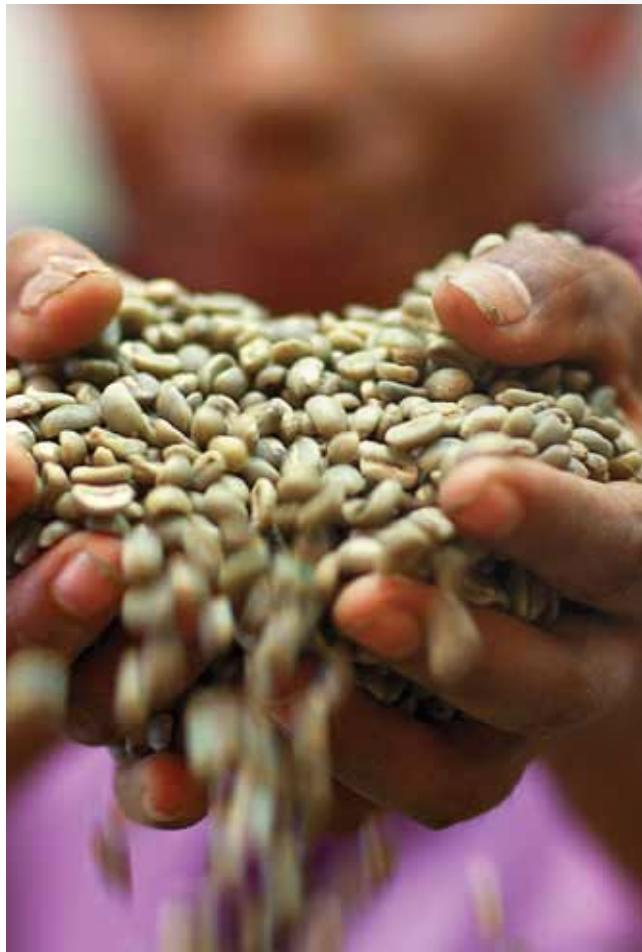
- In 1999, there was very little concern about “peak oil.” World oil production, according to the IEA’s 2000 forecast, would rise from 74 million barrels a day in October of 1999 to 96 million barrels a day by 2010, and continue growing for decades to come.

WORLD FOOD PRICES WERE AT OR NEAR RECORD LOWS.

- In a 1999 report² on world food prospects, the International Food Policy and Research Institute (IFPRI) noted that “between 1982 and 1995, real world wheat prices dropped by 28 percent, rice prices by 42 percent, and maize prices by 43 percent.”
- Looking ahead to 2020, IFPRI’s 1999 report predicted that food prices would “remain steady or fall slightly.” While forecasting a “continued slowdown in crop yield increases,” IFPRI indicated that real cereal prices would increase only slightly through 2010, and that after 2010 declining population growth and other factors would “reduce demand growth enough to cause cereal prices to resume their long-term downward trend.”³

HUNGER WAS ON THE RUN.

- Three years earlier, at the 1996 World Food Summit in Rome, delegates had set the goal of reducing the number of undernourished people in the world from 800 million to 400 million by 2015.⁷
- Richard Hoehn, Director of the Bread for the World Institute, boldly declared in 1998 that “the end of hunger is within reach,” and predicted that it could be eliminated within 15 years.⁸
- Although progress in the fight against hunger had slowed in recent years, optimism remained high. The theme for World Food Day 2000 was “A Millennium Free from Hunger.”



MARTINE PERRET, UN PHOTO.

METAL AND MINERAL PRICES WERE “DEPRESSED.”

- After a century of declining real commodity prices for oil, metals and minerals, many economists believed that productivity increases and ample supplies would keep commodity prices on a downward trend. A 1999 report to the UN on aluminum, copper and lead production concluded that, “In general, economic indicators do not provide evidence that these or other non-renewable resources are becoming significantly more scarce.” The report warned, in fact, that “price fluctuations and general trends of declining commodity prices negatively affect certain developing countries that depend heavily on the export of metal ores and/or metals for their foreign exchange revenues.”⁴

THE INTERNATIONAL COMMUNITY WAS UNITING TO FIGHT GLOBAL WARMING.

- After the adoption of the Kyoto Protocol on December 11, 1997, hopes were high that international cooperation would lead to successive international agreements that would commit the U.S. and emerging nations like China and India to binding targets for reducing greenhouse gas emissions.⁵
- As of October 12, 1999, the day of 6 billion, 84 nations had signed the Kyoto Protocol, and European nations were developing a market for carbon offsets that environmentalists hoped would serve as a model for the world.⁶

The World at 7 Billion—How the World looks in 2011

The world is a much different place today than it was in 1999. A century marked by falling prices, escalating hopes, and rising standards of living has given way to a decade of rising prices, deflated hopes, and setbacks in reducing hunger and world poverty. The fight against global warming has turned into a retreat, and leading thinkers are challenging traditional assumptions about the sustainability of economic growth. In March of 2009, *New York Times* columnist Thomas Friedman famously asked, “What if the crisis of 2008 represents something much more fundamental than a deep recession? What if it’s telling us that the whole growth model we created over the last 50 years is simply unsustainable economically and ecologically and that 2008 was when we hit the wall—when Mother Nature and the market both said: ‘No more.’”⁹

The news, of course, is not all bad. In the past 12 years several indicators of human well-being have improved, and progress in several areas is still being made. But the view today is fundamentally different than the outlook in 1999. In several important ways, the world at 7 billion is the mirror image of the world at 6 billion:

CRUDE OIL OUTPUT HAS PEAKED; HIGH OIL PRICES ARE HERE TO STAY.

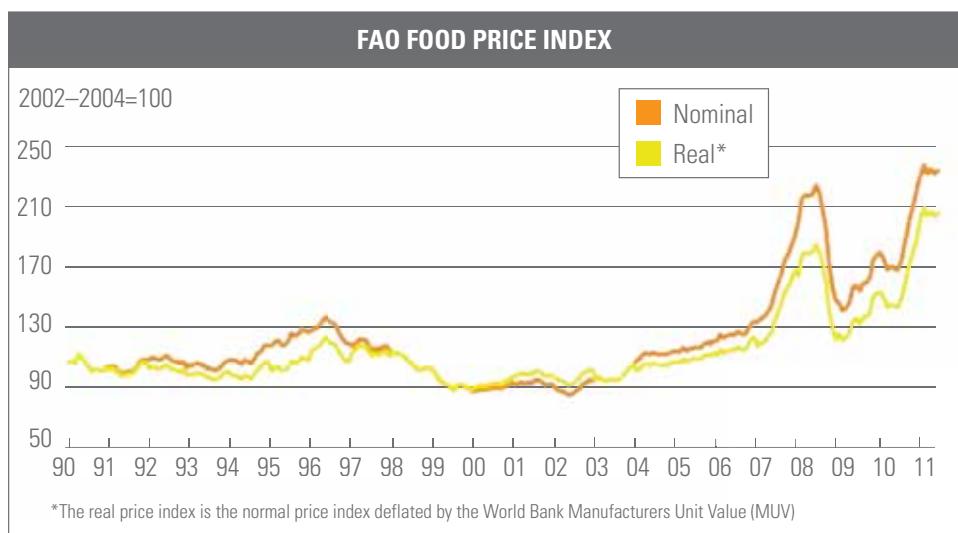
- In 2010, the world produced 87.4 million barrels per day (mb/d) of oil, sharply lower than the 96 mb/d

forecast in 1999. Much of the increased production came from tar sands and other unconventional oil sources rather than conventional crude oil. In a sharp reversal from earlier forecasts, the International Energy Agency last year projected that crude oil output would reach “an undulating plateau” of around 68-69 mb/d by 2020, but it would never again regain “its all-time peak of 70mb/d reached in 2006.”¹⁰

- The U.S. Energy Information Agency earlier this year projected that the average price of imported low-sulfur, light crude oil will rise from an average of \$83 a barrel in 2011 to \$100 a barrel in 2017 and \$125 a barrel by 2035.¹¹
- When asked to comment on the global energy situation, Fatih Birol, Chief Economist of the International Energy Agency, said in a BBC interview last September, “It is definitely depressing, more than depressing, I would say alarming...”¹²

FOOD PRICES HAVE REACHED RECORD HIGHS, AND HUNGER HAS STAGED A COMEBACK.

- On average, the prices of basic food commodities have more than doubled in recent years. In February of 2011 the Food and Agricultural Organization’s (FAO) Food Price Index of basic food commodities (grains, meat, dairy, sugars, oils and fats) reached a record high of 238 (2002-4 = 100). The FAO’s latest report, issued in September, showed only slight moderation in food prices. The index for August stood at 231, just below the record.
- There is a growing consensus that food prices will trend even higher in the years ahead. The OECD-FAO’s Agricultural Outlook 2011-2020, reports that, “A period of high volatility in agricultural commodity markets has entered its fifth successive year. High and volatile commodity prices and their implications for food insecurity are clearly among the important issues facing governments today.”
- In June of 2011, Oxfam International released a research report, *Growing a Better Future*, predicting that the price of key food staples could increase “120 to 180 percent by 2030.” The report warned that, “This will prove disastrous for food importing poor countries, and raises the prospect of a wholesale reversal in human development.”



WITH ONLY A FEW EXCEPTIONS, COMMODITY PRICES ARE AT OR NEAR RECORD PEAKS.

- In July of 2011 the World Bank's commodity price index for "metals and minerals" stood at 413.4 (2000=100). The price index for fertilizers stood at 433.3.
- The price index for non-food agricultural products (cotton, rubber, timber, etc.) has more than doubled in the past five years.¹³

THOUGH THE IMPACT OF CLIMATE CHANGE HAS BECOME MORE PRONOUNCED, THE GLOBAL RESOLVE ON CURBING GREENHOUSE GAS EMISSIONS HAS LARGELY EVAPORATED.

- Hopes were high that the 2009 Copenhagen climate change conference would lead the U.S. and China to accept strict targets for reducing greenhouse gas emissions, but neither the Copenhagen conference, nor the 2010 Cancun conference, produced any such accord.
- The International Energy Agency (IEA) estimates that global CO₂ emissions rose from 23.7 billion metric tons in 2000 to 29.9 billion metric tons in 2008, an increase of more than 25 percent.¹⁴
- After a one-year decline in 2009 caused by the Great Recession, greenhouse gas emissions resumed their ascent in 2010, rising to 30.6 billion metric tons according to the IEA.

- Unless current policies are changed, greenhouse gas emissions will continue to rise. In its 2010 *World Energy Outlook*, the IEA concluded that, "The commitments that countries have announced under the Copenhagen Accord...collectively fall short of what would be required to put the world onto a path to achieving the Accord's goal of limiting the global temperature increase to 2 degrees centigrade. If countries act upon these commitments in a cautious manner...rising demand for fossil fuels would continue to drive up energy-related CO₂ emissions through the projection period [2020]."



UN PHOTO/UNAMA.

Chapter 2

Population Projections are Rising Again

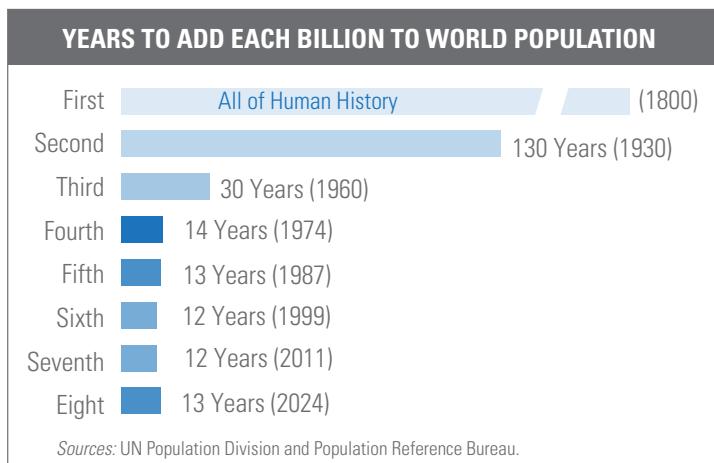
Twelve years ago, when world population was approaching the 6 billion mark, concerns about population were on the wane. While population was still increasing, there was a widely held belief that global fertility rates would continue declining, eventually falling below the “replacement rate,” and that world population, as a result, would stabilize in the second half of the 21st century, and then begin to fall. Indeed, with Europe’s fertility falling below the replacement rate, many at the time were concerned that a global “birth dearth” was imminent. In August of 1999, Max Singer, the founder of the Hudson Institute, warned in *The Atlantic*, that the world was in for rapid downsizing. “Fifty years from now,” he predicted, “the world’s population will be declining, with no end in sight.” Twelve years later, however, as we approach the 7 billion mark, world population is still growing...with no end in sight.

WE ARE CURRENTLY EXPERIENCING THE MOST RAPID POPULATION GROWTH IN HUMAN HISTORY: WE'RE ADDING 1 BILLION MORE PEOPLE TO THE PLANET EVERY 12 YEARS.

- It took close to 200,000 years for the population of modern humans to reach the 1 billion mark. It took just 12 years for world population to grow from 5 billion to 6 billion and from 6 billion to 7 billion.¹⁵ According to the UN’s latest estimate, it will only take 13 more years to reach the 8 billion mark.
- The rate of natural increase in world population in 2010 was 1.2 percent, a rate fast enough to double population in about 58 years. That may not seem like fast growth to some, but it comes on top of a very large base. Every day population increases by an estimated 227,252 people.¹⁶



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- When world population reached the 6 billion mark, world population was growing by about 78 million a year. This year, we will add an estimated 83 million people, or roughly the population of Germany.¹⁷
- It's not just birth rates: rising longevity is also contributing to population growth. Between 1990 and 2009, global life expectancy rose from 65 years to 69 years.¹⁸
- The rate of population growth is increasing in some parts of the world. Between 1990 and 2000, the population of sub-Saharan Africa grew at a rate of 2.6 percent per year. Between 2000 and 2010, it grew at an estimated rate of 2.8 percent.¹⁹
- While India's population growth rate continues to slow, India recently reached the 1.1 billion mark, and will likely surpass China's population by 2025 with a population of 1.4 billion or higher. By 2050, India's population could reach 1.7 billion.²⁰
- Africa's population crossed the 1 billion mark in 2010. Demographers now project that its population will reach 2.3 billion by 2050.²¹

WHILE THE GLOBAL FERTILITY RATE CONTINUES TO DECLINE, IT'S NOT DECLINING AS FAST AS MANY ANTICIPATED.

- Over the past half century, the average number of children borne by a woman in her lifetime has fallen dramatically. Between 1950 and 2000, the total fertility rate (TFR) declined from about 5.0 to about 2.7. But

the rate of decrease is slowing. Between 2000 and 2005, the global TFR was estimated at 2.62; between 2005 and 2010 it was estimated at 2.52.²²

- In times past, the biggest barrier to reducing birth rates has been a lack of access to contraceptives. Today, the biggest barrier is gender inequality. It's no coincidence that population growth rates are generally fastest in those nations where girls are taken out of school at an early age, the status of women is low, violence against women is high, and reproductive rights are not respected. Unless more is done to boost the status of women, fertility rates in the least developed countries may remain high for decades to come.

IN SOME COUNTRIES THE FERTILITY RATE IS ACTUALLY INCREASING.

- Over the past half century, international assistance has given women in developing countries increased access to modern methods of birth control, but the level of aid has decreased sharply in the past 15 years. As a result, women in some areas are finding it more difficult to access supplies or to find a satisfactory method of contraception.²³
- In developing countries, the contraceptive prevalence rate (CPR) rose from 55 percent to 61 percent between 1990 and 2000, but the pace of expansion has slowed down. The CPR rose to just 63 percent in 2007.²⁴
- Fertility rates have fallen dramatically in Europe over the past half-century, sparking fears of "birth dearth". Indeed, in many countries, particularly in Eastern Europe, lifetime fertility rates are well below the generally accepted replacement rate of 2.1, but fertility rates in Europe have rebounded. In 2003, Europe's lifetime fertility dropped to 1.47 children per woman, and by 2008 it was 1.56.²⁵
- While fertility is slowly declining in many developing nations, it appears to be increasing in a few countries, like Burundi and Zimbabwe in Africa, and Kazakhstan and Kyrgyzstan in Central Asia.²⁶

Last year the World Bank released a new five-year Action Plan to help 57 countries with high maternal death and fertility rates. In doing so, it recognized the critical importance of increasing support for family planning and reproductive health programs: “*Vastly better health for women and families lies at the heart of the transformational promise of the Millennium Development Goals (MDGs) for 2015. The landmark 1994 Cairo International Conference for Population and Development had earlier recognized the vital importance of women’s health to development progress in calling for a comprehensive approach to reproductive health. In the years immediately following the conference, reproductive health gained much-needed prominence. But by the turn of the century, family planning and other reproductive health programs vital to poor women had fallen off the development radar of many countries, donors, and aid agencies.*”



KIBAE PARK, UN PHOTO.

Fertility rates in focus: After decades of decline in Kenya, average lifetime fertility increased from 4.7 children in 1998 to 4.9 in 2003.²⁷ Today it's back down to 4.7,²⁸ but that small up-tick in fertility changed the long-term population projections. In 1990, demographers were predicting Kenya's fertility would continue to decline and that the population

of Kenya in 2050 would be 53 million.²⁹ The latest demographic projections indicate it will reach 96 million by mid-century.³⁰ Waning donor nation support for family planning is believed by many to be the primary cause.

Fertility rates in focus: With encouragement from government and religious leaders, the fertility rate in Iran dropped dramatically after the fall of the Shah. In 1980, women on average had nearly seven children, but by 2006, the number of children on average fell to two. Last year, however, President Mahmoud Ahmadinejad unveiled plans to boost Iranian fertility rates by providing significant cash subsidies for new births. He believes that Iran can sustainably double the size of its current population.³¹

THE HISTORIC DECLINE IN THE ADOLESCENT BIRTH RATE MAY HAVE STALLED.

- Globally, the birth rate for women between the ages of 15 and 19 has continued to decline, but not by much. In 1990 there were 60 births for every thousand women in that age bracket. In 2000, there were 50 such births. In 2007, there were 48.³²
- In some areas, the rate of adolescent births is rising again. In the least developed countries, the number of births per 1,000 women (ages 15-19) declined from 133.3 in 1990 to 116.7 in 2000. But between 2000 and 2007, it rose to 121.0.³³



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PERCENTAGE OF WOMEN AGED 20-24 WHO WERE MARRIED/IN UNION BEFORE THE AGE OF 18

Niger	75	Zambia	42	Benin	34
Chad	72	Nicaragua	41	Gabon	34
Mali	71	Dominican Republic	40	Sudan	34
Bangladesh	66	Afghanistan	39	Sao Tome & Principe	33
Guinea	63	Congo, Dem. Repub. Of	39	Yemen	32
Central African Republic	61	Honduras	39	Comoros	30
Mozambique	52	Madagascar	39	Haiti	30
Nepal	51	Nigeria	39	Zimbabwe	30
Malawi	50	Senegal	39	Nauru	27
Ethiopia	49	Liberia	38	Vanuatu	27
Burkina Faso	48	Tanzania	38	Bolivia	26
Sierra Leone	48	Brazil	36	Kenya	26
Eritrea	47	Cameroon	36	Marshall Islands	26
India	47	Cote d'Ivoire	35	El Salvador	25
Uganda	46	Guatemala	35	Ghana	25
Somalia	45	Mauritania	35		

Source: UNICEF, http://www.childinfo.org/marriage_countrydata.php

*Based on latest available data

WORLD POPULATION (THOUSANDS) ALL VARIANTS 2000-2100				
YEAR	MEDIUM VARIANT	HIGH VARIANT	LOW VARIANT	CONSTANT FERTILITY VARIANT
2000	6 122 770	6 122 770	6 122 770	6 122 770
2005	6 506 649	6 506 649	6 506 649	6 506 649
2010	6 895 889	6 895 889	6 895 889	6 895 889
2015	7 284 296	7 350 953	7 217 275	7 323 598
2020	7 656 528	7 832 370	7 480 225	7 772 757
2025	8 002 978	8 316 521	7 689 135	8 231 506
2030	8 321 380	8 776 486	7 867 332	8 700 336
2035	8 611 867	9 225 306	8 006 642	9 191 971
2040	8 874 041	9 679 064	8 096 725	9 722 061
2045	9 106 022	10 143 887	8 131 432	10 302 084
2050	9 306 128	10 614 318	8 112 191	10 942 544
2055	9 474 911	11 082 006	8 046 170	11 659 393
2060	9 615 189	11 546 322	7 940 112	12 475 188
2065	9 731 202	12 015 187	7 798 443	13 417 831
2070	9 827 113	12 498 658	7 624 235	14 518 851
2075	9 905 469	13 002 042	7 420 399	15 812 675
2080	9 968 538	13 525 786	7 191 850	17 339 315
2085	10 019 612	14 068 865	6 946 100	19 146 428
2090	10 062 090	14 630 726	6 691 274	21 289 304
2095	10 097 100	15 209 903	6 433 361	23 830 463
2100	10 124 926	15 804 873	6 177 378	26 843 946

Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 2010 Revision*, <http://esa.un.org/unpd/wpp/index.htm>, Friday, August 26, 2011; 2:58:53 PM

CHILD MARRIAGE IS STILL PREVALENT IN MANY PARTS OF THE DEVELOPING WORLD.

- An average of 25,000 girls a day become child brides, and unless something is done to change this trend within the next 10 years, over 100 million girls in the developing world will become child brides.³⁴
- Where the tradition of child marriage survives, fertility and adolescent pregnancy rates remain high. As do maternal and infant mortality rates. Despite the passage of laws banning early marriage, the practice still persists in many parts of Africa and South Asia.

Child marriage in focus: Adolescent pregnancies in the developing world, particularly in areas where access to reproductive health services is limited, pose a significant health risk to girls and young women. Too young to safely bear children, they can have obstructed pregnancies and complications leading to death or an obstetric fistula (a hole in the uterus) that can leave them incontinent and social outcasts. The stories themselves are heart-wrenching, but the numbers are terrifying: the World Health Organization estimates that more than 2 million young women in Asia and South Africa currently live with untreated obstetric fistula.³⁵

Child marriage in focus: In Yemen about one-third of Yemeni girls marry before the age of 18, and in some of the villages, girls are married at half that age. International condemnation of the practice is building thanks to the story of Nujood Ali, a young Yemeni girl, who is now 13 years old and divorced. Forced to marry at age 10, Nujood was pulled out of school and told that she was to be married to a 30-year-old man. Her husband reportedly raped her on their wedding night, even after promising her father that he would not touch her until a year after her first period. After several beatings, she ran away and sought—and received—a divorce in 2008.³⁶

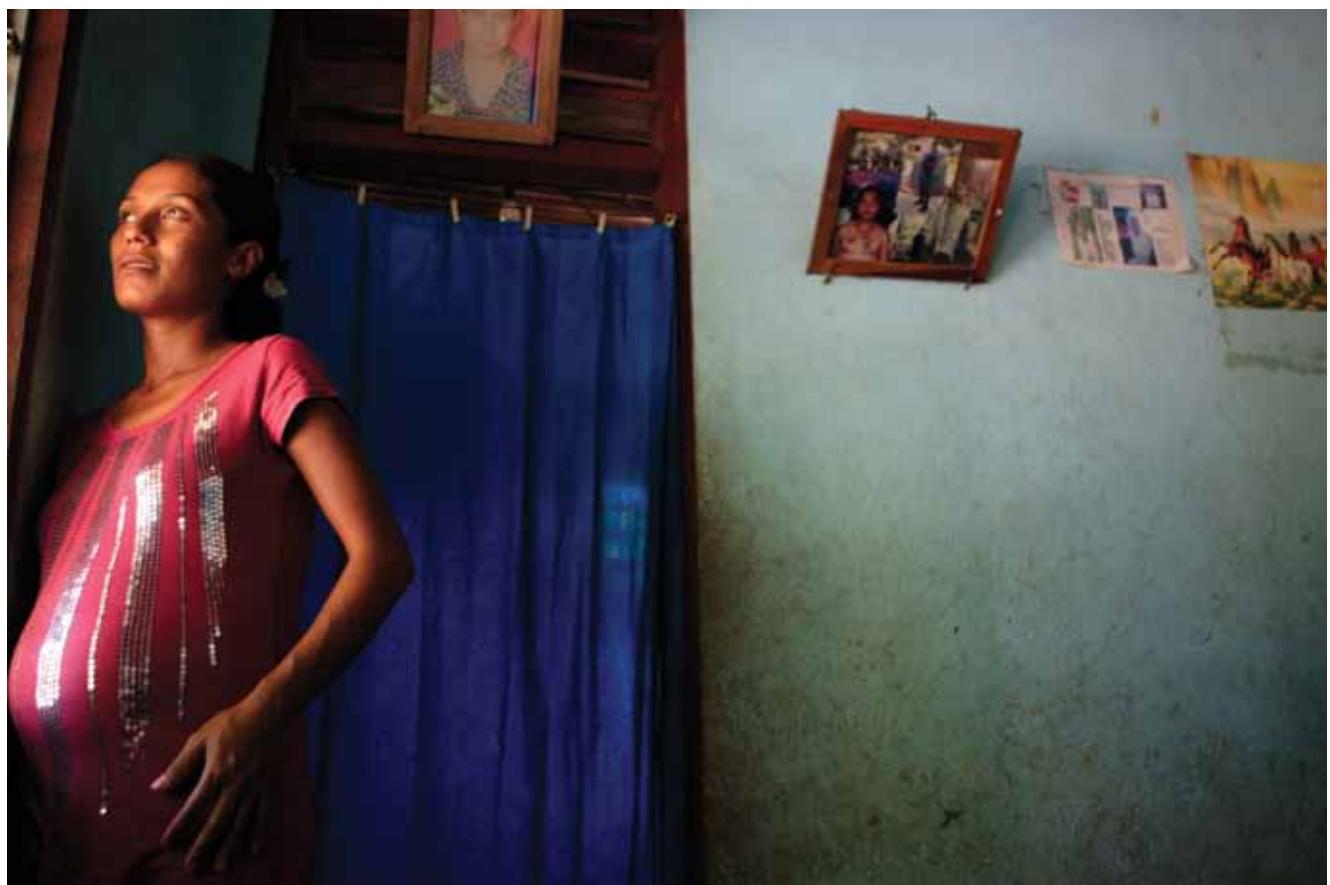
UNINTENDED PREGNANCIES IN THE DEVELOPED WORLD REMAIN HIGH, PARTICULARLY IN THE U.S.

Preventing unwanted and unintended pregnancies in the developed world, where carbon and ecological footprints are much larger, is critical to reducing greenhouse gas

emissions and slowing global resource depletion. In the United States, about 40 percent of all pregnancies are unwanted or unintended,³⁷ but conservatives in Congress are seeking to abolish funding for programs that provide family planning services and information to low-income households.

POPULATION PROJECTIONS ARE NOW ON THE RISE AS THE DECLINE IN FERTILITY SLOWS.

- In 1999, the UN “medium variant” projection indicated that world population would reach the 7 billion mark in 2013. It now projects that the 7 billion mark will be reached on October 31, 2011.³⁸
- When world population crossed the 6 billion mark in 1999, the UN projected that world population would reach 8.9 billion by 2050. Earlier this year, the UN released its latest projection for 2050: 9.3 billion.³⁹
- A decade ago, many demographers were predicting that world population would peak at or near the mid-century mark. The UN’s latest “medium variant” projection indicates that world population will reach 10 billion by 2082 and continue growing.⁴⁰
- If fertility rates don’t fall as projected, world population could grow indefinitely. The UN’s “high variant” projection indicates that world population could rise to 15.8 billion by the end of the 21st century.⁴¹
- The pledges that were made at the 1994 International Conference on Population and Development have not been fulfilled. While the total number of women of reproductive age in the developing world has grown steadily since the Cairo conference, the level of international family planning assistance has fallen sharply.⁴²
- The UN has set 2015 as the target year for achieving universal access to reproductive health care, but unless donor nations dramatically step up their commitments, the target will not be met. Between 2000 and 2008, international support for family planning, as a percentage of total health



MARTINE PERRET, UN PHOTO.

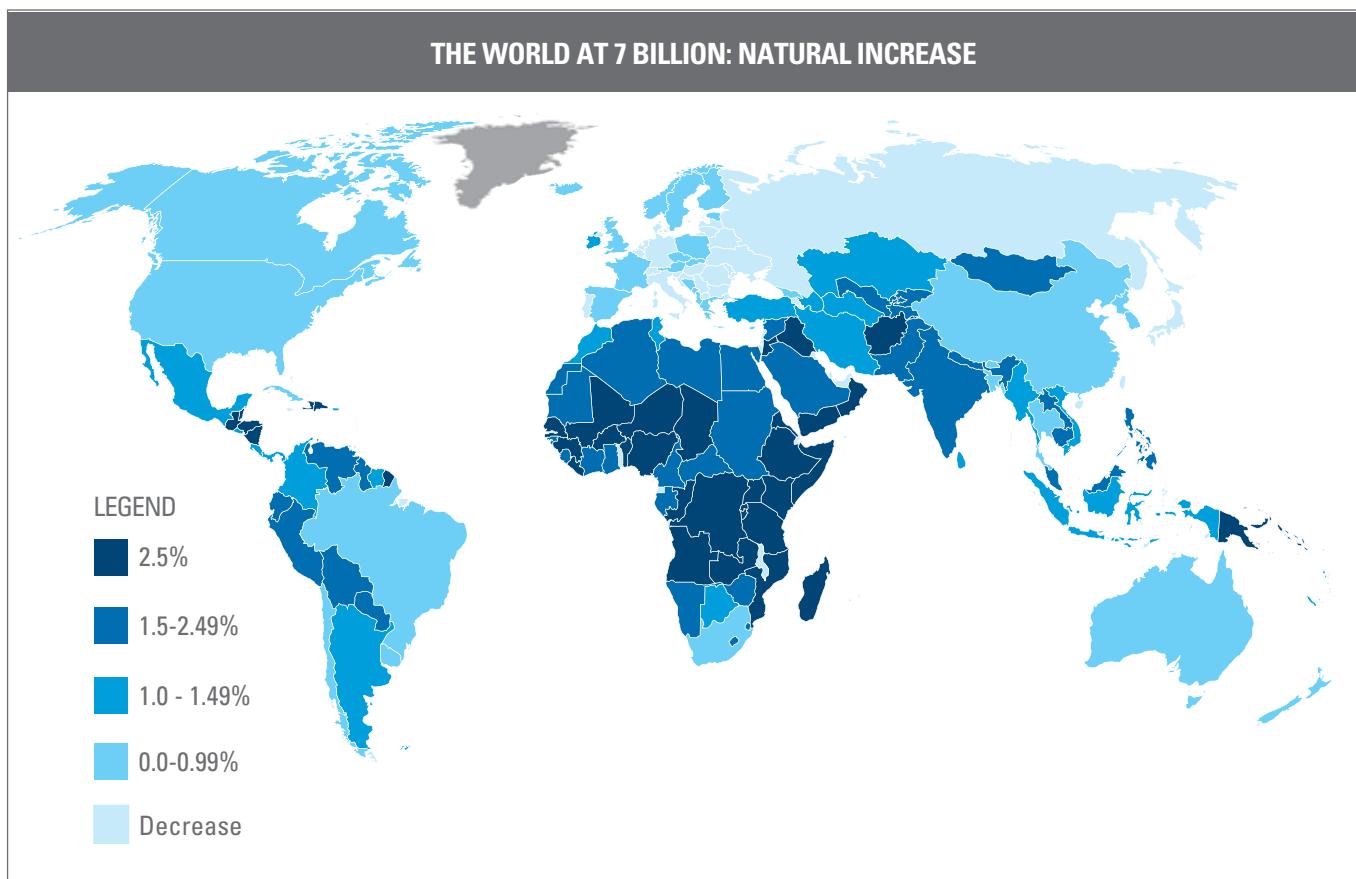
care assistance, declined from 8.2 percent to 3.2 percent.⁴³ Today, an estimated 215 million women in the developing world want to avoid or delay a pregnancy, but they are not using a modern method of contraception.⁴⁴

Population in focus: Baroness Valerie Amos, UN Under-Secretary-General for Humanitarian and Emergency Relief:

"Population is a key problem [in Niger]. It is one of the poorest countries in the world with high levels of malnutrition and illiteracy. Nearly 50 percent of people there are under 15 and population is doubling every 21 years. It is 15.2 million now and expected to be more than 50 million by 2050. That is unsustainable....A serious government has to put resources into education and farming, but it must also educate women to have fewer children. Girls and women must be educated....We respond in crisis situations, but we are only plugging gaps for a short time. Our actions are saving millions of people, but we need to be doing more to help them help themselves."⁴⁵

Population in focus: Fertility rates tend to fall very slowly in countries that treat women harshly. Women in Afghanistan suffer from high rates of domestic violence and a culture that denigrates the status of women. A recent survey, in fact, ranked Afghanistan as the "worst place in the world to be a woman."⁴⁶ Lacking access to reproductive health care and effectively denied reproductive choice, Afghan women on average bear nearly six children. And as a result, Afghanistan's population, despite high maternal and infant mortality rates, is projected to grow from 32 million today to 76 million by 2050.⁴⁷

Population in focus: Haiti, the poorest country in the Western Hemisphere, has the fastest growing population in the Caribbean. The mountains in Haiti are already denuded, the soil eroded, and food production—despite a large jump in the use of fertilizer—has been in decline for over two decades.⁴⁸ As a consequence, it is heavily dependent on food imports, food assistance, and remittances for survival. Four out of five Haitians live in poverty, half in severe poverty.⁴⁹



Source: PRB 2011 World Population Data Sheet
<http://www.prb.org/Publications/Datasheets/2011/world-population-data-sheet/world-map.aspx#/map/population>

RATE OF NATURAL INCREASE BY COUNTRY – TOP 50							
Niger	3.6%	Angola	2.8%	Ethiopia	2.7%	Western Sahara	2.3%
Uganda	3.4%	Togo	2.8%	Papua New Guinea	2.6%	Cote d'Ivoire	2.3%
Burundi	3.2%	Somalia	2.8%	Oman	2.6%	Guinea-Bissau	2.3%
Liberia	3.1%	Congo, Dem. Rep. of	2.8%	Eritrea	2.6%	Ghana	2.3%
Burkina Faso	3.1%	Madagascar	2.8%	Vanuatu	2.6%	Samoa	2.3%
Yemen	3.1%	Mozambique	2.8%	Jordan	2.6%	Laos	2.2%
Mali	3.1%	Comoros	2.8%	Congo	2.5%	Sierra Leone	2.2%
Zambia	3.1%	Afghanistan	2.8%	Marshall Islands	2.5%	Syria	2.2%
Timor-Leste	3.1%	Palestinian Territory	2.8%	French Guiana	2.5%	Cameroon	2.2%
Gambia	3.0%	Senegal	2.8%	Nigeria	2.5%	Belize	2.1%
Mayotte	3.0%	Kenya	2.7%	Mauritania	2.4%	Pakistan	2.1%
Iraq	3.0%	Guinea	2.7%	Sudan	2.4%	Honduras	2.1%
Benin	2.9%	Solomon Islands	2.7%	Guatemala	2.4%	Central African Republic	2.1%
Chad	2.9%	Sao Tome and Principe	2.7%	Tajikistan	2.4%	Rwanda	2.1%
Tanzania	2.9%	Malawi	2.7%	Equatorial Guinea	2.3%	Egypt	2.0%

Source: PRB 2011 World Population Data Sheet
<http://www.prb.org/DataFinder/Topic/Rankings.aspx?ind=16&fmt=16&tf=3&loc=3&sortBy=value&sort=Descending>

Notes: Rate of natural increase is the birth rate minus the death rate, expressed as a percent.

Chapter 3

How the World is Changing

The world may not be facing a doomsday scenario, but that doesn't mean that all is well. During the 12 years that it has taken for world population to grow from 6 billion to 7 billion, the challenges facing the world with respect to climate change, energy, food and water have grown exponentially, and so have the challenges of meeting the Millennium Development Goals and maintaining the progress that has been made to date. We need to reflect on how the world is changing, where we have made progress, where it's no longer being made, and where we are losing ground.

Thanks to the Millennium Development Goals and the dramatic growth of the emerging economies, the human condition has improved in many parts of the world, but as important as it is to recognize the gains, we must be ever mindful of the emerging challenges.

The Millennium Development Goals

In 2000, the United Nations unveiled a set of Millennium Development Goals (MDGs) designed to focus the world's development assistance on reducing hunger and severe poverty, making significant progress in improving health, education, gender equality, employment opportunities, and protecting the environment. In support of those goals, the UN set forth a number of ambitious targets, most of them to be achieved by 2015. Some of the targets are quite specific (e.g. reducing by two-thirds the mortality rate of children under five), while others are more general (e.g. addressing the special needs of the least developed countries).

Over the past decade, the UN and the international donor community have made heroic efforts and historic strides towards the fulfillment of those goals and the supporting targets. The lives of hundreds of millions in the developing

world have been measurably improved, and hopes remain high that most of the specific targets contained within the goals can still be achieved by 2015. Time, however, is beginning to run out on a number of the targets. Some, like universal access to reproductive health, will almost certainly not be achieved unless there is a substantial increase in donor nation assistance. Other targets, like halving the proportion of people living on less than a dollar a day, could easily be missed if there is another global recession. Similarly, if the prices of wheat, corn, and other basic food commodities continue to rise, it will be difficult, if not impossible, to reduce by half the proportion of people who suffer from hunger.

Where progress has been made in fulfilling the MDGs, it has not been uniform. Some nations, like China, have made spectacular gains, but in many parts of South

MILLENNIUM DEVELOPMENT GOALS

1. Eradicate extreme poverty and hunger;
2. Achieve universal primary education;
3. Promote gender equality and empower women;
4. Reduce child mortality;
5. Improve maternal health;
6. Combat HIV/AIDS, malaria and other diseases;
7. Ensure environmental sustainability; and
8. Build a global partnership for development

In releasing the *Millennium Development Goals Report* 2011, UN Secretary-General Ban Ki-moon cautioned that, "...we still have a long way to go in empowering women and girls, promoting sustainable development, and protecting the most vulnerable from the devastating effects of multiple causes, be they conflicts, natural disasters or volatility in prices for food and energy."

Asia and sub-Saharan Africa the gains are not nearly as impressive. In the 2011 progress report on the MDGs, the UN reported, for example, that the goal of reducing the proportion of people suffering from hunger by one-half by 2015 will not be met in sub-Saharan Africa if current trends persist. Indeed, a close examination reveals that many of the MDGs in sub-Saharan Africa are in peril unless there is substantial improvement in the global economy and a corresponding boost in development assistance.

There is, in the words of the Population Reference Bureau, a growing "demographic divide" in the world between those countries that have undergone a successful demographic transition and those that have not.⁵⁰ On one side of that divide, countries have low fertility rates, low maternal and infant mortality rates, and poverty and hunger are still in retreat. On the other side, fertility rates remain high, as do maternal and infant mortality rates, and life for the poorest of the poor is still a struggle for survival.

Even if the world economy rebounds, there is a danger that the most vulnerable will still be left behind. The hope is that expanded international development assistance will reach the poorest of the poor. The fear is that current aid levels are already inadequate and that, in an era of increasing austerity, the level of donor nation assistance will decline.⁵¹ There are already signs that the world's largest donor nation, the United States, will be severely restricting aid. In the summer of 2011, a House Appropriations Committee subcommittee voted to cut foreign assistance by 20 percent for Fiscal Year 2012.

From 6 Billion to 7 Billion: The Critical Challenges

As world population approaches the 7 billion mark, the world faces a set of critical challenges that, if not met, could slow, and even reverse, the progress we have made in improving the human condition. The challenges relate only in part to population growth; excessive consumption, waste and inefficiencies, and inappropriate government policies all play a significant role in creating these challenges. But if we fail to meet these emerging challenges when there are 7 billion people on the planet, how will we meet them when there are 8 or 9 billion people?

Experts can debate endlessly as to how much resource scarcity and environmental degradation is caused by *population* versus *consumption*, but if the problems of scarcity are not addressed, people will surely suffer, and those that suffer the most will be the poorest of the poor.



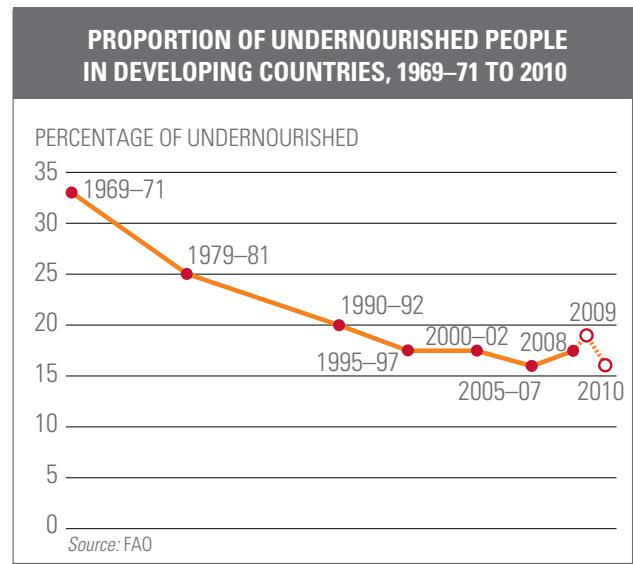
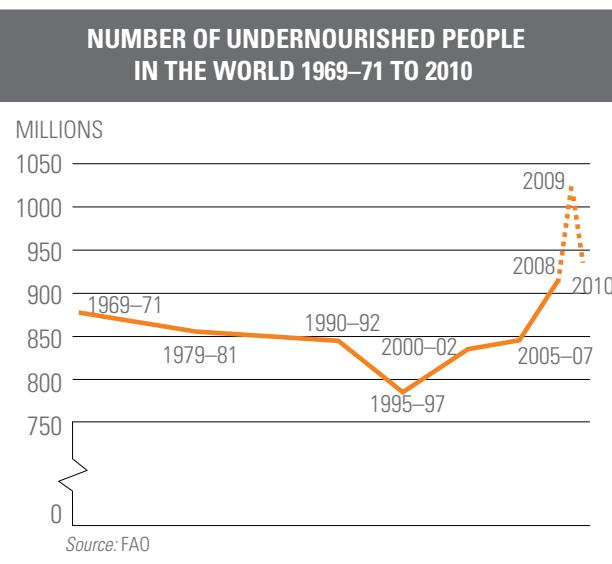
ERIC KANALSTEIN, UN PHOTO.

CRITICAL CHALLENGE #1:
THE NUMBER OF HUNGRY PEOPLE IN THE WORLD IS AT OR NEAR THE RECORD HIGH SET IN 2009.

- At the 1996 World Food Summit in Rome, the FAO warned that unless progress was greatly accelerated, there would still be an estimated 680 million chronically hungry people in the world by the year 2010.⁵² In September of 2011, with food prices at near record highs, the World Bank estimated that there were 948 million undernourished people in the world.⁵³
- In 2000, the MDGs set the goal of reducing between 1990 and 2015 the proportion of people in the developing world who suffer from hunger, cutting it from 20 percent to 10 percent. But between 2000-2 and 2008 the percentage of undernourished people declined very modestly, if at all, and the actual number grew from 818 million to over 900 million. In 2009, the number of hungry people in the world was estimated at a record 1 billion.⁵⁴ While that number receded in 2010, a subsequent spike in food prices (2010-11) has produced yet another jump in the number of undernourished.
- Twenty-five percent of the chronically hungry in the developing world are children. An estimated 146 million children in developing countries are

underweight—a result of acute or chronic hunger.⁵⁵ Being underfed or undernourished can stunt growth, impair health, reduce life expectancy, and limit future economic productivity.

- Climate change, by raising temperatures and increasing the frequency of both droughts and flooding, will restrict crop yields. Already, droughts in East Africa and the African Sahel are getting worse; the current drought in the Horn of Africa may be the worst in over 60 years. Last year, Pakistan and parts of China suffered from near record floods and Russia experienced record heat and drought.
- To keep pace with projected population growth, food production in the developing world will need to double by mid-century. The FAO estimates that reaching that goal will require investments of \$83 billion a year, \$11 billion a year in sub-Saharan Africa alone.⁵⁶
- Despite the rising concerns about the world food situation, the brutal reality is that agricultural development assistance has fallen dramatically in the past two decades—more than 40 percent since the mid-1980s⁵⁷—and debt woes will make it more difficult for donor nations to increase their assistance. Absent a reversal in current trends, the international assistance that's needed will never materialize.



Note: Figures for 2009 and 2010 are estimated by FAO with input from the United States Department of Agriculture, Economic Research Service. Full details of the methodology are provided in the technical background notes (available at www.fao.org/publication/sofi/en.).



ARNE HOEL, WORLD BANK.

Hunger in focus: Famine has returned this year to Africa. After visiting the drought-stricken Horn of Africa, Josette Sheeran, Executive Director of the World Food Programme, reported encountering “roads of death,” and warned that “we could lose a generation.”⁵⁸ But despite that alarming assessment and predictions that tens of thousands could be dying, major donor nations like Germany and France have been slow to provide emergency funding.⁵⁹

Hunger and population in focus: Many of the countries that are highly dependent on food imports also have some of the fastest growing populations. The population of Somalia, which is currently suffering from famine, is projected to rise from 9.9 million to 22.6 million by mid-century.⁶⁰ The population of Egypt, which currently imports about 40 percent of its grain and other basic foods, is expected to grow from 83 million to nearly 120 million by 2050.⁶¹ The population of Niger, already heavily dependent on food aid,⁶² is projected to rise from 16.1 million to 55 million by mid-century.⁶³

**CRITICAL CHALLENGE #2:
HIGH FOOD PRICES, COMBINED WITH A SLUGGISH
GLOBAL ECONOMY, HAVE SET BACK EFFORTS TO MAKE
FURTHER GAINS IN REDUCING SEVERE POVERTY.**

- MDG #1 sets the goal of halving, between 1990 and 2015, the proportion of people whose income is less than \$1 a day, and the UN remains hopeful that the target can be achieved, but progress has been uneven.⁶⁴
- The number of people living in severe poverty fell between 2000 and 2005, but almost all of the decline occurred in China and other parts of East Asia.⁶⁵ Between 1990 and 2005, the number of people living in severe poverty in sub-Saharan Africa rose from 296 million to 387 million.⁶⁶
- We don't yet know with any precision what impacts the Great Recession and higher food prices have had on severe poverty, as comprehensive data are not yet available for 2008, 2009, and 2010. However, the

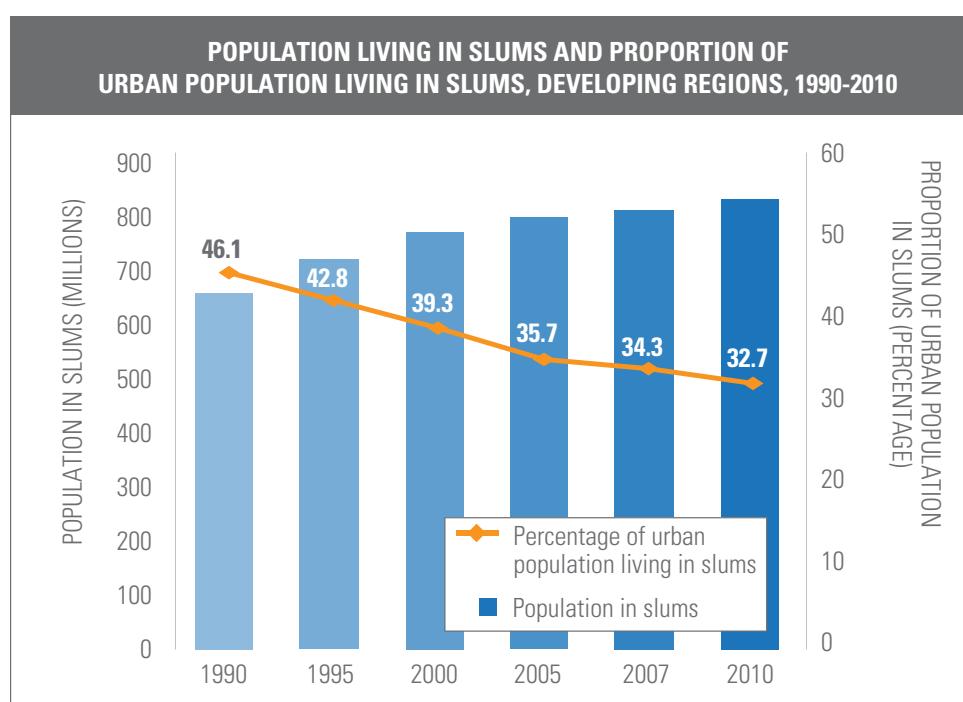
World Bank earlier this year estimated that 44 million people were pushed into severe poverty by the surge in food prices that occurred in 2010-11.⁶⁷

- Many of those living in severe poverty, particularly the one out of four hungry people who live in urban shantytowns, were spending 50 to 70 percent of their income on food *before* food prices began spiking in 2007.
- The United Nations believes that the MDG goal of reducing the rate of severe poverty is still attainable.⁶⁸ Progress, however, will depend on keeping food prices low and avoiding another global economic contraction. If food prices spike yet again, or another major economic slowdown sets in, all bets are off.

Poverty in focus: Despite global success over the past few decades in reducing the incidence of severe poverty, progress is far from uniform. The World Bank reports that between 1981 and 2005, the incidence of poverty fell from 79 percent to 18 percent in East Asia and the Pacific Region. But in sub-Saharan Africa, the number of severely poor nearly doubled and its share of the world's poor jumped from 11 percent to 27 percent.⁶⁹

CRITICAL CHALLENGE #3: RAPID URBANIZATION, CONTINUED POPULATION GROWTH, AND RISING FOOD PRICES ARE SETTING BACK EFFORTS TO ELIMINATE URBAN SLUMS.

- The MDGs set the goal of achieving a “significant improvement in the lives of at least 100 million slum dwellers” by 2020. While that goal has been achieved already, the number of people living in urban slums continues to mount. In 1990, there were an estimated 657 million, and 767 million in 2000. Today there are 828 million urban slum dwellers.⁷⁰
- In 2010, 62 percent of the urban population in sub-Saharan Africa was living in slums.⁷¹ Population growth in many areas long ago exceeded the infrastructure capacity. The number of urban dwellers in Africa without access to safe drinking water rose from nearly 30 million in 1990 to more than 55 million in 2008, while the number of people without reasonable sanitation services doubled to around 175 million.⁷² Still, the number of people living in African cities is expected to triple over the next 40 years.⁷³

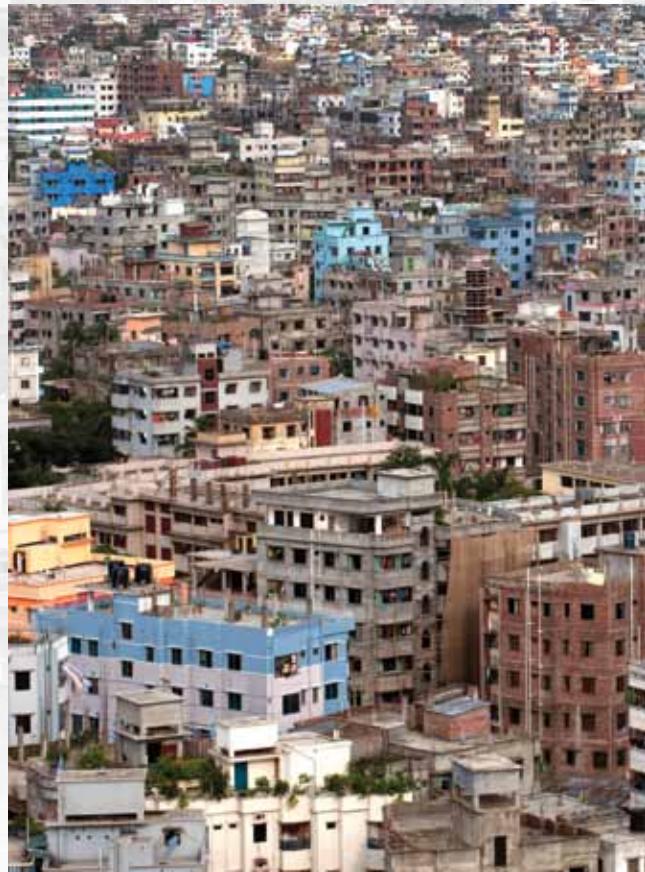


Urbanization in Focus: The Democratic Republic of Congo (DRC) is one of the world's poorest, most conflict-ridden countries in the world, but population growth is rapid, and people are fleeing to the cities. The population of Kinshasa, the capital of DRC, will increase by 46 percent over the next 10 years to become one of the continent's fastest-growing cities.⁷⁴ It is already one of the continent's most violence-prone cities, and children, in particular, are at risk of abduction and violence.

Urbanization in Focus: Mauritania, a traditionally nomadic country with a population today of about 3 million people, is rapidly urbanizing. The population of its capital, Nouakchott, rose from about 20,000 in 1969 to 150,000 in 1980, to somewhere between 800,000 and 2,000,000 today. The city draws its fresh water from a large underground lake, but engineers fear that the city will run out of water by mid-century.⁷⁵

**CRITICAL CHALLENGE #4:
WATER SCARCITY IS BECOMING DIRE.**

- The limits for sustainable water resources have already been exceeded in Western Asia and Northern Africa. Water use in Southern and Central Asia is also approaching dangerous levels.⁷⁶
- Globally, water withdrawals have tripled over the last 50 years. By 2025, water withdrawals are projected to increase by another 50 percent in developing countries and 18 percent in developed countries.⁷⁷
- The rate at which we are pumping dry underground reservoirs more than doubled between 1960 and 2000.⁷⁸
- About 40 percent of the world's food supply comes from the 18 percent of farmland that's irrigated, and irrigation today accounts for 70 percent of world water use, but—as rivers shrink and ground water levels fall—the use of water for irrigation will decline in many areas of the world.⁷⁹
- About 90 percent of the people who will be added to the population by 2050 will be in developing countries, many in areas that are already experiencing water stress.⁸⁰



KIBAE PARK, UN PHOTO.



ESKINDER DEBEBE, UN PHOTO.



- Demand for water is expected to outstrip supply by 40 percent within the next 20 years. By 2030, an estimated 3.9 billion people – about half of the world's population —will be living in areas of high water stress.⁸¹

Water scarcity in focus: Thanks to irrigation, Saudi Arabia became self-sufficient in wheat production in the 1980s and 1990s. A few decades of pumping water has nearly depleted the underground aquifers and by 2012 Saudi Arabia could be almost entirely dependent on wheat imports.⁸²

Water scarcity in focus: Yemen, one of the most arid countries in the world, is a hydrological disaster. Water levels are sinking fast. In the Sana'a basin, consumption outpaces the aquifer's natural recharge rate by a factor of five to one. Experts say that Sana'a, the capital, will run out of water by 2015.⁸³

Water scarcity in focus: In 2010, the Strategic Foresight Group, a think tank based in Mumbai, India, released a report titled *The Himalayan Challenge: Water Security in Emerging Asia*, which warned that, “The cumulative effect of water scarcity, glacial melting, disruptive precipitation patterns, flooding, desertification, pollution, and soil erosion will be a massive reduction in the production of rice, wheat, maize and fish. Both India and China will face drops in the yield of wheat and rice anywhere between 30-50% by 2050.”

CRITICAL CHALLENGE #5: ACCESS TO SAFE DRINKING WATER IS STEADILY IMPROVING, BUT THERE IS VERY LITTLE PROGRESS IN IMPROVING SANITATION FOR THE POOREST OF THE POOR.

- MDG #7 seeks to halve the proportion of the population without sustainable access to safe drinking water and basic sanitation. According to the UN, the safe drinking water target will likely be met, but 1 out of 10 people in the developing world will still be without access in 2015.⁸⁴
- Very little progress has been made in improving sanitary conditions. The UN reports that about half of the population of the developing world—2.5 billion—is still not using an improved form of sanitation.⁸⁵

CRITICAL CHALLENGE #6: COMPETITION FOR ARABLE LAND IS INCREASING.

- Agricultural areas have expanded by only five percent since the 1970s,⁸⁶ and the capacity for further conversion of land to agricultural use is limited. Most of the arable land that remains is covered by rainforest.
- As grain reserves shrink and food prices rise, the competition for the remaining arable land that is not covered by rainforest has accelerated. In the past few years, major food importing countries, like Saudi Arabia, South Korea, and China, have been buying or leasing large tracts of land in sub-Saharan Africa and other parts of the world. The World Bank in 2010 reported that over 140 million acres have been leased or acquired in developing countries.⁸⁷
- In 2009 alone, foreign interests leased or purchased agricultural lands in sub-Saharan Africa that equaled a land area the size of France.⁸⁸
- Much of the arable land that is being purchased in the developing world today is of marginal utility, and may not produce great or even modest yields. The competition for agricultural land is driving up land prices worldwide and making it harder (i.e. more expensive) to boost food production.
- Biofuels are also competing for agricultural land. Even before the recent spikes in oil prices, the UN was projecting that the growing demand for biofuels would require 35 million hectares of land by 2030—an area approximately the size of France and Spain. It warned that this increased competition “poses a tremendous threat” to the livelihoods of farmers, pastoralists, and forest dwellers with no formal land rights.”⁸⁹

Agricultural land in focus: In the world's newest country, South Sudan, over one tenth of the land has been leased to foreign interests. Now struggling with a major drought, the newly independent government of South Sudan recently issued an urgent appeal for additional food aid.

Agricultural land in focus: South Korea, short on arable land and high in population density, has been very active in buying and leasing farmland in sub-Saharan Africa. In 2008, a South Korean company, Daewoo Logistics, negotiated a 99-year lease for 1.3 million hectares of farmland in Madagascar. The deal was eventually scrapped after a coup in 2009 ousted Madagascar's president. While that deal fell through, South Korean companies successfully purchased 700,000 hectares of land in Sudan.

**CRITICAL CHALLENGE #7:
DESERTIFICATION AND LOSS OF TOPSOIL ARE TAKING A SLOW, BUT FRIGHTENING, TOLL.**

- While the rate of desertification slowed slightly in the past decade, the FAO warns that land degradation overall is increasing, affecting more than 20 percent of all cultivated areas, 30 percent of forests, and 10 percent of grassland.⁹⁰
- The FAO estimates that by 2020, 135 million people may lose their land as a result of soil degradation, including 60 million people in sub-Saharan Africa.⁹¹
- The United States, according to one expert, is losing soil 10 times faster—and China and India are losing soil 30 to 40 times faster—than the natural replenishment rate.⁹²

Soil erosion in focus: “Erosion is one of those problems that nickels and dimes you to death: One rainstorm can wash away 1 mm (.04 inches) of dirt. It doesn't sound like much, but when you consider a hectare (2.5 acres), it

would take 13 tons of topsoil—or 20 years if left to natural processes—to replace that loss. And that kind of loss occurs year after year by wind and rain around the world.” David Pimentel, 2006.⁹³

**CRITICAL CHALLENGE #8:
RISING ENERGY PRICES THREATEN ECONOMIC GAINS.**

- Many economists believe that the 2008 oil spike, which saw oil prices soar to over \$140 a barrel, was a contributing factor to the Great Recession, and that high oil prices pose a continuing threat to global economic activity.
- While oil exporting countries have benefited from higher oil prices, higher prices for liquid fuels is accelerating inflation in the emerging countries, and hurting the development prospects of developing countries that are dependent on oil imports.



NWFBLOGS, GULF COAST OIL RIG.

“There are signs that [food] production costs are rising and productivity growth is slowing. Energy related costs have risen significantly, as have feed costs. Resource pressures, in particular those related to water and land, are also increasing. Land available for agriculture in many traditional supply areas is increasingly constrained and production must expand into less developed areas and into marginal lands with lower fertility and higher risk of adverse weather events.” OECD and FAO, "Agricultural Outlook 2011-2020”



MURDANI USMAN, CENTER FOR INTERNATIONAL FORESTRY RESEARCH.

- Rising energy prices are steadily driving up the costs of producing food. While demand is raising the “ceiling” on food prices, rising production costs are raising the “floor.” Unless the prices of fuel, fertilizer, and land recede, food costs will never return to their historic lows.

CRITICAL CHALLENGE #9:

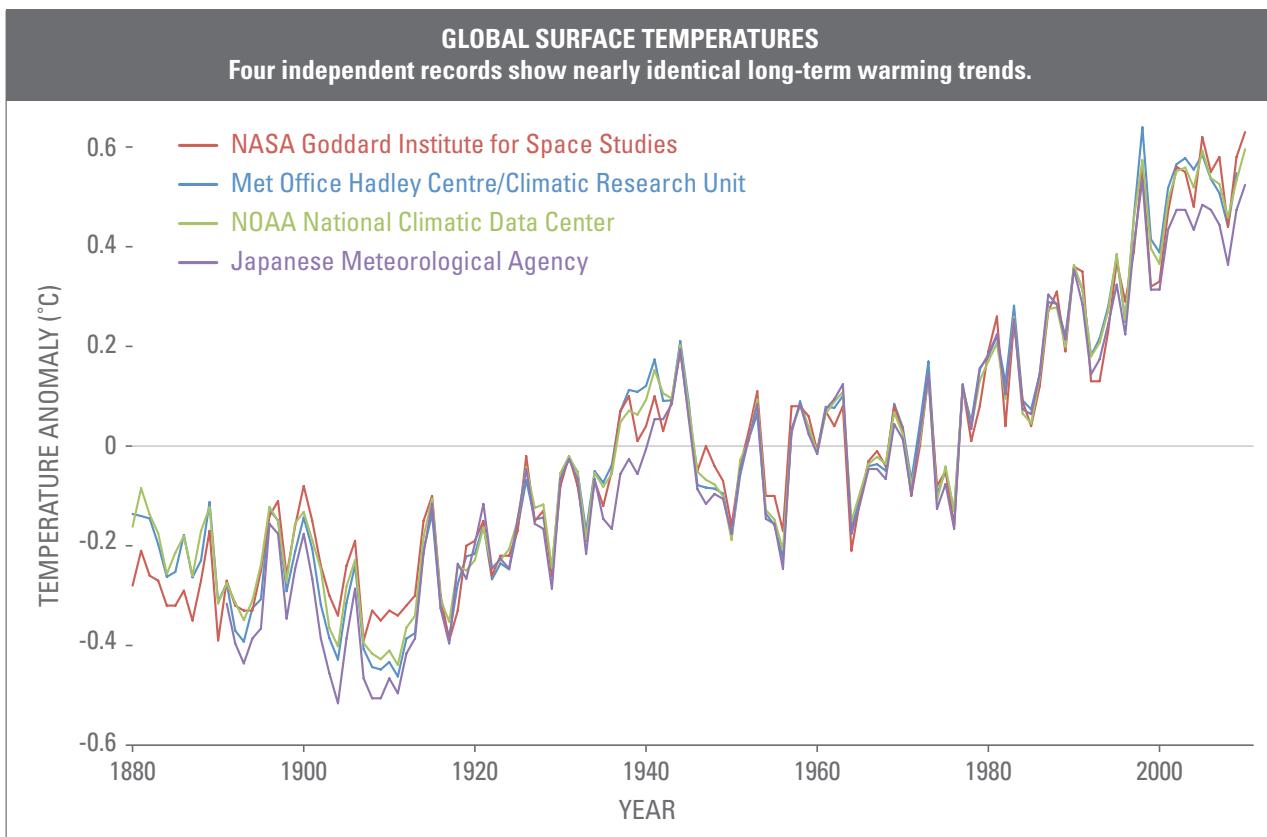
THE GLOBAL RATE OF DEFORESTATION HAS DECLINED OVER THE PAST DECADE, BUT THAT TREND COULD EASILY BE REVERSED.

- Overall the rate of deforestation has fallen in the last decade. International pressures, along with targeted economic incentives, have helped to slow the pace of destruction. The UN reports that the global rate has declined from “16 million hectares per year in

the 1990s to about 13 million hectares per year in the past decade.”⁹⁴

- While the rate of deforestation has slowed in most parts of Asia, forests are disappearing rapidly in South America and Africa.⁹⁵
- Even in Asia there are signs that deforestation may be on the rise again, spurred in large part by the world’s escalating demand for palm oil. From 2000-2009, Indonesia supplied more than half of the global palm oil market, surpassing Malaysia as the world’s top producer. Its palm oil exports have increased by nearly 30 percent per year. Much of that increase has come at the expense of peat lands and tropical forests. An estimated 340,000 hectares of Indonesian countryside has been converted to palm oil production.
- While the rate of deforestation in the Amazon has tapered off over the past decade, economic pressures are building anew. The latest data from Brazil indicate a 27 percent jump in deforestation from August 2010 to April 2011.⁹⁶ The world’s rising demand for soybeans may be behind the latest spike: The biggest rise was in Mato Grosso, which produces more than a quarter of Brazil’s soybean harvest.
- Much of the world’s deforestation is driven by the world’s growing appetite for lumber, food, cooking oils, and liquid fuels, but in many developing countries deforestation is propelled by urbanization, the needs of subsistence farmers, and household demand for fuel. In a half century or less, poor countries like Haiti, Ethiopia, and even Pakistan have been effectively deforested, accelerating the loss of topsoil and making them more vulnerable to floods.

Deforestation in focus: In 2010 Pakistan suffered catastrophic flooding. At one point, nearly one-fifth of the country was under water. Torrential rains were largely responsible for the flooding, but they were aided and abetted by decades of deforestation in some of the worst affected areas. Largely denuded of forests, Pakistan remains under the constant threat of severe, even catastrophic, flooding.



Credit: NASA Earth Observatory/Robert Simmon

Data Sources: NASA Goddard Institute for Space Studies, NOAA National Climatic Data Center, Met Office Hadley Centre/Climatic Research Unit, and the Japanese Meteorological Agency.

Deforestation in focus: Deforestation in Haiti has largely destroyed any hope of a sustainable future. After a massive earthquake hit Haiti last year, worries mounted that heavy rainfall would impede recovery efforts, which proved to be the case. In addition to drowning deaths, flooding contributed to an outbreak of cholera, killing hundreds. But the threat of flooding in Haiti never goes away. In July of this year, torrential rains swept 23 people in Haiti to their deaths, most of whom were living in the capital city of Port-au-Prince.

CRITICAL CHALLENGE #10: THE WORLD IS WARMING.

- The World Meteorological Organization (WMO) reports that 2001-10 was the warmest decade on record since 1880, and that 1991-2000 was the second warmest decade.⁹⁷
- 2010 tied 2005 and 1998 for the hottest year on record. The WMO reports that “the average global

temperatures last year were estimated to be $0.53^{\circ}\text{C} \pm 0.09^{\circ}\text{C}$ above the 1961–1990 annual average of 14°C .⁹⁸

- Sea-ice loss in the Arctic has accelerated dramatically over the last decade, rising faster than official forecasts. The latest report from the National Snow and Ice Data Center indicates that this summer’s decline in Arctic sea ice is on pace to exceed the record set in 2007.

Global warming in focus: The World Meteorological Organization reports this year that “recent warming has been especially strong in Africa. Temperatures for the 2001–2010 decade averaged 0.85°C above normal, 0.49°C warmer than any previous decade, and the five hottest years on record for the continent have all occurred since 2003. East Africa, which had never had a year as much as 1°C above normal prior to 2003, has now reached this threshold in eight successive years.”



MARCO DORMINO, UN PHOTO/UNICEF.

CRITICAL CHALLENGE #11: SEVERE WEATHER IS ON THE INCREASE...AND SO ARE THE RISKS.

- More people are living in harm's way. The past half-century has seen a rapid and accelerating increase in the number of people living near the oceans, adding to the number of people who will be affected by threats such as rising seas, tsunamis, hurricanes, and typhoons. By 2025, an estimated 2.75 billion people will be living within 60 miles of a coast.⁹⁹
- Climate experts have long predicted that a warming planet would result in intensified droughts and flooding. No one can say which, if any, of the record droughts and floods that have afflicted the world in recent years are attributable to climate change, but the observed trends are fully consistent with official climate change forecasts.
- The 2007 *Fourth Assessment Report* of the Intergovernmental Panel on Climate Change indicated that, "Tropical storm and hurricane frequencies vary considerably from year to year, but evidence suggests substantial increases in intensity and duration since the 1970s."

Extreme weather in focus: Reflecting on the 2010 crop failure in Russia, Lester Brown asked, "What if the 2010 heat wave centered in Moscow had instead been centered

in Chicago? In round numbers, the 40% drop from Russia's recent harvests of nearly 100 million tons cost the world 40 million tons of grain, but a 40% drop in the far larger U.S. grain harvest of over 400 million tons would have cost 160 million tons....In short, if the July temperature in Chicago had averaged 14 degrees above the norm, as it did in Moscow, there would have been chaos in world grain markets. Grain prices would have climbed off the charts." *The World on Edge*, 2011.

CRITICAL CHALLENGE #12: THE OCEANS AND COASTAL ECOSYSTEMS ARE IN PERIL.

- Despite international conventions designed to protect endangered species, the populations of large predator fish in the ocean—including shark, tuna and cod—have declined at an alarming rate over the past decade. Ninety percent of all large fish populations have now disappeared.¹⁰⁰ Some are being brought back from the brink of extinction by fishing bans, but populations of these species may never recover. Consumer demand for fish is simply too great.
- Globally, the annual marine fish catch peaked in 1996 at 83.5 million tons and fell to 79.5 million by 2008. The percentage of "overexploited, depleted or recovering fish stocks" increased from 10 percent in the mid-1970s to 33 percent by 2008.¹⁰¹



JIM MARAGOS, US FISH AND WILDLIFE SERVICE.

"If the number of failing states continues to increase, at some point this trend will translate into a failing global civilization. Somehow we must turn the tide of state decline."

Lester Brown, 2011.

- The larger concern is that overfishing, climate change, and pollution will conspire to destroy entire ecosystems, including coral reefs and mangroves, within a generation, and that the very future of the oceans is in danger.

The oceans in focus: "The findings are shocking. As we considered the cumulative effect of what humankind does to the ocean, the implications became far worse than we had individually realized. This is a very serious situation demanding unequivocal action at every level. We are looking at consequences for humankind that will impact in our lifetime, and worse, our children's and generations beyond that." *State of the Ocean 2011*¹⁰²

CRITICAL CHALLENGE #13:

THE RATE OF BIODIVERSITY LOSS IS STILL PROCEEDING AT AN ALARMING RATE.

- Biodiversity is not just critical to the maintenance of a healthy ecosystem. According to the Convention on Biological Diversity, an estimated 40 percent of the global economy and 80 percent of the needs of the poor are supported by biological resources.
- MDG #7 sought to achieve a significant reduction in the rate of biodiversity loss by 2010, but the UN's *Global Biodiversity Outlook-3*, published in May of 2010, found, on the whole, that there was "no indication of a significant reduction in the rate of decline in biodiversity." It warned that "the principal pressures leading to biodiversity loss are not just constant but are, in some cases, intensifying." The report indicated that 42 percent of all amphibian species and 40 percent of bird species are declining in population. It concluded that, "There is a high risk of dramatic biodiversity loss and accompanying degradation of a broad range of ecosystem services."



JULIE LARSEN MAHER, WILDLIFE CONSERVATION SOCIETY.

CRITICAL CHALLENGE #14: THE NUMBER OF FAILING STATES IS RISING.

- There is neither a precise definition of a "failing state" nor a formal ranking, but in the past decade, a growing number of countries have earned that label, including Sudan, Somalia, Chad, the Democratic Republic of Congo, Afghanistan, and Yemen. Wars, natural catastrophes, severe weather, high food prices, corruption, and other factors are destroying the ability of poor countries to meet the basic needs of their citizens.
- Rapid population growth, by itself, does not make a nation a "failing state," but it can make it far more difficult for a country to make progress in reducing mortality rates, hunger, and severe poverty. Of the 20 countries that rank highest on the 2011 *Failing States Index* (published by *Foreign Policy* magazine), all but one have a total fertility rate (TFR) of 3.5 or higher. More than half have a TFR in excess of 5.0.

Chapter 4

The Challenges Ahead

We live on a finite planet with finite resources, but the hope has always been that there are no practical limits to growth, that human population and per capita consumption can increase for the foreseeable future without overtaxing Earth's capacity to meet our needs. Failing that, the hope has been that population growth would peak before limits to growth are reached, and then begin to decline, giving us more time to abolish hunger and severe poverty. No one knows with any certainty what the future holds, but there is a growing concern that we are already approaching—or even exceeding—those limits to growth.

The Global Footprint Network and the World Wildlife Fund publish a *Living Planet* report every two years that measures humanity's "ecological footprint." The latest report, issued in 2010, indicates that our demands on the planet are already exceeding the Earth's capacity to regenerate resources by about 50 percent, and that, by 2030, we may need "two Earths" to sustain levels of consumption. What that means is that we are destroying or depleting our renewable resources—like tropical forests and underground aquifers—far faster than their capacity to regenerate. The problem—and it's a "growing" one—is that we can only do that for so long.

Ultimately, there comes a day of environmental reckoning. And every day, in ways large and small, we are beginning to encounter those limits. Overgrazing and overplanting are depleting topsoil. Ocean fisheries are being fished to exhaustion. Ocean acidification is destroying the coral reefs. And after just a few decades of pumping water from underground aquifers, wells in many areas are going dry.

The doomsday warnings may be overstated, but the challenges that underpin those fears cannot be safely ignored. In addressing concerns related to climate change, energy, food, and water, the world faces an array of tough

choices and a host of competing priorities. Efforts to boost agricultural production, for example, may complicate efforts to reduce ocean pollution and greenhouse gas emissions. Similarly, efforts to reduce greenhouse gas emissions may wreak havoc with the energy needs of emerging nations, and efforts to regulate and reduce water usage may deprive the neediest of their access to water. Solving the world's problems has never been easy, but the interlocking challenges we now face are making the search for solutions harder.

If demographic push comes to economic shove, many will be hurt, but it's the poorest of the poor who will suffer the most. If the prices of basic food staples, like bread and rice, double or triple again in the next decade, it will be a problem for many, but it will be a catastrophe for the urban poor living on \$1 or \$2 a day. Even the rural poor, many of whom work on farms, spend a significant amount of their incomes on food.

Similarly, if extreme weather patterns intensify as now expected, the whole world will suffer in some form, but it's the poorest of the poor who will be on the front lines of climate change. Rising seas, intensifying droughts and flooding, along with rising temperatures and severe storms will, in many cases, deprive them of their basic livelihoods and threaten their very existence. Many, like the people now fleeing drought in Somalia, will have to move to survive.

In recent years the international community has issued stark warnings about these challenges and the corresponding need to redouble support for agricultural development, water conservation, sustainable energy, and, most importantly, family planning and reproductive health programs:

Food: Two years ago, the UN's FAO observed that food production in the developing world would have to double by mid-century to keep up with population growth, and

that doing so would require an annual investment of \$83 billion a year in agricultural development.¹⁰³ In February of this year, World Bank President Robert Zoellick announced that higher food prices were pushing “about 44 million people into extreme poverty.” He bluntly warned that “...there is no room for complacency. Global food prices are now at dangerous levels. It is already clear recent price rises for food are causing pain and suffering to poor people around the globe.”¹⁰⁴

Living Standards: In past years, the United Nations Development Program’s Human Development Index reports have indicated “living standards in most countries have been rising—and converging—for several decades now.” The 2011 report will not be released until November, but UNDP has already warned that this year’s report will project “a disturbing reversal of those trends if environmental deterioration and social inequalities continue to intensify, with the least developed countries diverging downwards from global patterns of progress by 2050.”

Environment: The United Nations Environment Program releases an annual Green Economy Report, and the 2011 report notes that the world has changed dramatically since the Rio Summit of 1992: “Then we were just glimpsing some of the challenges emerging across the planet from climate change and the loss of species to desertification and land degradation. Today many of those seemingly far off concerns are becoming a reality with sobering implications for not only achieving the UN’s Millennium Development Goals, but challenging the very opportunity for close to seven billion people—rising to nine billion by 2050—to be able to thrive, let alone survive.”

Numerous warnings like these have been issued, reports released, and pledges made, but many donor nation commitments remained unfulfilled, and the level of aid falls far short of what is required, even in response to humanitarian disasters like the recent earthquake in Haiti or the famine in Somalia. Donor fatigue was a problem before the U.S., Japan, and Europe began wrestling with their sovereign debt woes, and it’s much worse today. Simply put, the world does not seem prepared to invest what is required to eliminate hunger and severe poverty

with 7 billion people on the planet, let alone 9 or 10 billion. And if food and energy prices continue to rise, dragging down global economic performance and fueling inflation in the emerging economies, it’s getting harder and harder to imagine that the necessary assistance will be forthcoming.

Nor do world leaders appear willing to tackle climate change with anywhere near the determination and commitment needed to avoid the worst. Despite mounting evidence that climate change is contributing to the frequency of record or near-record droughts and floods, public concern appears to have peaked, and a beleaguered acceptance has set in.

Even worse, many of the policies pursued by the developed nations, including the U.S., continue to hinder economic development in the developing world and exacerbate the world’s environmental woes. Fuel subsidies in some countries, particularly in oil-exporting countries, have artificially boosted the global demand for oil. Biofuel subsidies have converted agricultural land from food production to fuel production. Agricultural subsidies have made it impossible for small farmers in the developing world to compete. Some of these policies may be reversed in the years ahead; the U.S., for example, may do away with ethanol subsidies in an effort to trim its budget deficit. But the damage, for the most part, has already been done and it will not be easily reversed.

Worst of all, however, is the false hope, born of the successes of the 20th century, that the world is boundless and that there are no limits to growth. A leading U.S. columnist, Jeff Jacoby, recently declared that, “When human beings proliferate, the result isn’t less of everything to go around. The planet doesn’t run out of food and fuel, minerals, and metals. On the contrary, most resources have grown cheaper and more abundant...”¹⁰⁵ Jacoby is not alone in his “cornucopian” optimism; many believe that the global economy can grow forever, and that shortages of food, fuel, and water are just temporary inconveniences. The experience of the past 12 years, however, suggests otherwise.

What the world needs is a little good news....

Chapter 5

The Good News

In the years ahead, the world faces many difficult challenges, including the tasks of making the transition from a carbon economy to a post-carbon economy, boosting food production, and coping with—and mitigating the effects of—climate change. No one should underestimate the enormity of those challenges, particularly as solving one global challenge will often exacerbate another. But there is good news, and while it may not solve all the world's problems, it may give us a little more time to address them.

HERE'S THE GOOD NEWS:

Our demographic future is not written in stone.

Many people take demographic projections as destiny. When demographers project that the world will have 9 billion people by 2042 many scientists, policymakers, and opinion leaders just accept that it will happen. But even small changes in fertility rates can make a big difference in how fast population grows and when world population will begin to stabilize. If fertility rates had not declined as sharply as they did in the last half century world population today could be 9 billion or higher. The expansion of family planning services and information altered our demographic destiny. If fertility rates fall significantly faster than currently anticipated, world population could possibly peak at around 8 billion and then begin to decline.

We know what it takes to reduce fertility rates and it's very affordable.

The first step in reducing fertility rates is ensuring that women everywhere have access to family planning and reproductive health services. Family planning is, by almost any measure, inexpensive. The UN estimates that there are 215 million women who want to avoid a pregnancy but who are not using a modern method of contraception. Providing that many women with family planning services and information would cost an additional \$3.5 billion a



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year, a small fraction of what the world already spends every year for development assistance. Such a small investment would produce an impressive array of benefits and major cost savings in other areas.¹⁰⁶

Increasing access to contraceptives, by itself, may not yield a rapid reduction in fertility rates, but combined with other cost-effective measures that serve to delay age of marriage and reduce desired family size, fertility rates could fall much faster than currently projected. Providing girls with meals at school, for example, can boost their attendance rates and raise the age of marriage. Similarly, stricter enforcement of laws banning child marriage can dramatically reduce early pregnancies.

Broader use of entertainment media, including “social content” radio soap operas, can also yield transformational results. By promoting respect for girls and women, informing women about their family planning options, and role modeling positive social behaviors, entertainment programs can change attitudes and behaviors and reduce desired family size. Such programming played a significant role in the decline of fertility in countries like Mexico and Brazil, and it has shown great promise in sub-Saharan Africa where gender inequality and cultural and social barriers to reduced fertility remain high.¹⁰⁷

Family planning and reproductive health programs constitute a “win-win” proposition for women, their families, their communities, and the world at large.¹⁰⁸

- The impact of expanding family planning services and information and giving every woman access to reproductive health care services is nothing less than revolutionary. The benefits are impressive at every level.
- With better spacing of births, more mothers survive pregnancy and more infants survive birth, producing families that are healthier and more stable.¹⁰⁹
- Educational enrollment increases, as parents with fewer children can better afford to send their children to school, leading to greater economic productivity at the family and national levels.
- By delaying childbearing, girls and women are better able to stay in school and work outside the household.
- When women are able to give birth by choice, rather than by chance, they are better able to control their lives, space their pregnancies, and care for their children.
- Smaller families can put less stress on the local environment and help communities cope with water scarcity.
- Smaller families can improve food security in countries that are already heavily dependent on external food aid.
- Smaller families can slow the process of urbanization, giving cities more time to build the necessary infrastructure, which, in turn, increases economic productivity.
- Smaller families allow parents to save money and build capital for use in escaping poverty.

- There's no mystery as to why so many women around the world have used family planning and reproductive health services. Most women want to be able to decide how many children to have and when to have them, and they want to make those decisions free from male domination or religious and social taboos. Empowering women and giving them family planning services and information may be the single most important thing that we can do to create a just and sustainable world.

The challenge in focus: “As a former Minister of Health in Nigeria and now head of a United Nations agency, I have come to one inescapable conclusion: if we are to tackle the consequences of growing populations, we need to invest in adolescents and young people now. Investing in the education, health and skills of young people can save lives and boost productivity and prosperity. When adolescent girls are educated and healthy and can avoid child marriage, unintended pregnancy and HIV, they can contribute fully to society and pave the path to development.” Dr. Babatunde Osotimehin, Executive Director of the United Nations Population Fund, *Huffington Post*, 2011¹¹⁰



JULIE LARSEN MAHER, WILDLIFE CONSERVATION SOCIETY.

Chapter 6

Conclusion

Putting more people on the planet has put enormous pressure on planetary resources. Over the past 100 years, we've added over 5 billion more people, all desiring a better life. But the real issue—the predominant cause for concern—is not what impact population growth will have on high prices for food, energy and water. It's what impact higher prices for food, energy, and water will have on a world that is already struggling to meet its basic needs. It's too late to prevent higher prices; 7 billion people and higher and higher levels of consumption will inevitably strain world resources. It's not too late, however, to limit the human suffering that will be inflicted by climate change and rising food prices. We must make the least developed countries self-sufficient and far more resilient.

While we may have made notable, even heroic, progress in making immunizations, safe drinking water, and education more available to children in the developing world, those same young people are inheriting a world in which arable land and water are in increasingly short supply, food and fuel prices are steadily increasing, rivers and lakes are shrinking, water levels are falling, temperatures are rising, drought and flooding are intensifying, biodiversity is declining, the number of failing states is expanding, and the very future of ocean habitats is threatened.

While we should celebrate the progress that we have made with respect to the MDGs, we ignore these other challenges at our peril. There are differing views as to the relative roles that population and consumption play in environmental degradation and resource depletion. But there's no question, absolutely none, that environmental problems and resource scarcity will make it very hard to meet the needs of a growing population.

Fertility rates in the world continue to decline, but not as briskly as before. Adolescent pregnancy rates remain high, and with the world's largest generation of people now entering their prime reproductive years, world population may not stabilize as soon as previously hoped or expected. While lack of access to contraceptives is still a problem in many parts of the world, and urgently needs to be addressed, supplying more contraceptives may not yield significant drops in fertility rates without a fundamental shift in attitudes toward women and girls and the abandonment of practices like child marriage.

In the races against hunger, severe poverty, and economic and social injustice, time is not on our side. We urgently need to educate and empower women and girls, advance reproductive choice, and make universal access to reproductive health information and services a reality. If we fall short on any of these objectives, we will endanger the largest generation of young adults the world has ever known, and put at risk many of the gains that we have made in improving the human condition.

As population crosses the 7 billion mark, let us not despair. Let us renew our commitments to family planning, the advancement of women, and the creation of a more sustainable world, and let us do so with full recognition of the challenges that lie ahead.

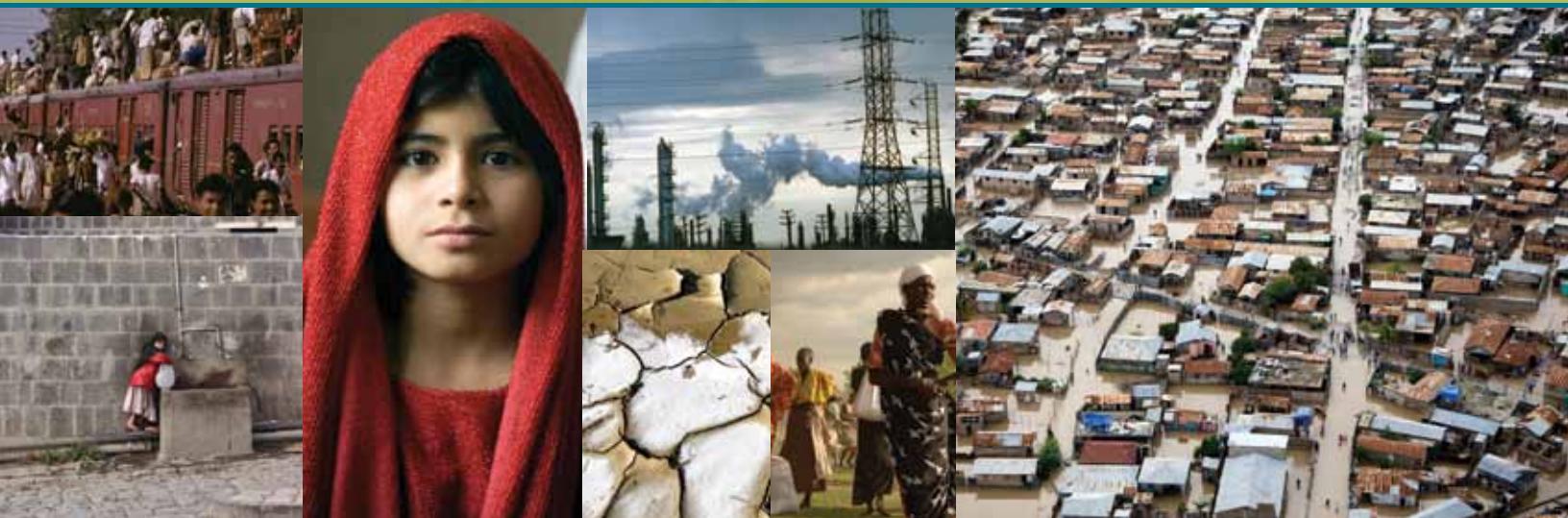
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