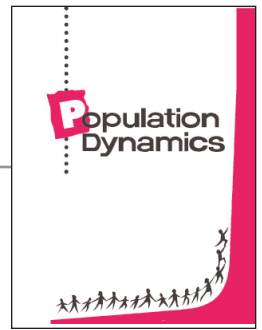


The People Connection

Student Reading

“Population growth may be the most pressing issue we face as we enter the new millenium.”

National Geographic Magazine, January 1998



Central to so many of the environmental, social, and economic issues facing the planet today are people – our numbers and our behaviors. Although barely noticeable on a day-to-day basis, human population pressures threaten the health of our ecosystems and the quality of life for Earth’s inhabitants.

Consider that in the six seconds it takes to read this sentence, 15 more people will inhabit the globe. In fact the world’s population grows at nearly a record pace, adding a New York City every month and a Germany each year. There are now over seven billion people and counting. This growth in human numbers has been described as a “population explosion,” doubling ever faster over the past 300 years.

What Ignited the Explosion?

Rapid population increases have been a very recent development in the scope of human history. People lived on Earth for about three million years before the world population reached 500 million around 1600. Until then, **birth rates** and **death rates** were in balance, keeping the population stable. Although birth rates were high, death rates – particularly among children – also remained high.

By the 17th century, this balance of birth and death rates began to change as advances in medical care, sanitation, food production, and nutrition increased **life expectancy** for children and adults. Death rates dropped, but birth rates remained high and the population grew steadily. By 1800, at the height of the Industrial Revolution in North America and Europe, global population reached one billion.

As industrialization grew throughout the Western world, people exchanged their agrarian lifestyles for homes and jobs in burgeoning cities. Without land to farm, large families became neither necessary nor practical. Slowly, birth rates dropped in rapidly industrializing nations. This three-part population pattern – from high birth and death rates, to high birth and low death rates, and finally to low birth and death rates – is now referred to as the **demographic transition**. In the non-industrialized nations of Africa, Latin America, and Asia, however, birth rates remained high at the same time that death rates dropped as new agricultural and medical technologies were imported from

more developed countries. Economic conditions in these nations did not always improve as life spans increased. The resulted in a pattern throughout much of the globe of population explosion while the demographic transition stagnates in the middle stage for the least developed countries. By 1960, the world population reached three billion. Just 15 years later, in 1975, the population soared to four billion, topped five billion in 1987 reached six billion in 1999 and seven billion in 2011, completely doubling in less than 40 years. It now appears that global population growth is finally turning a corner as birth rates begin to fall worldwide. Even so, **demographers** now project that the global population will continue to grow, albeit more slowly than in the past century, adding an additional two to four billion more people by the end of this century.

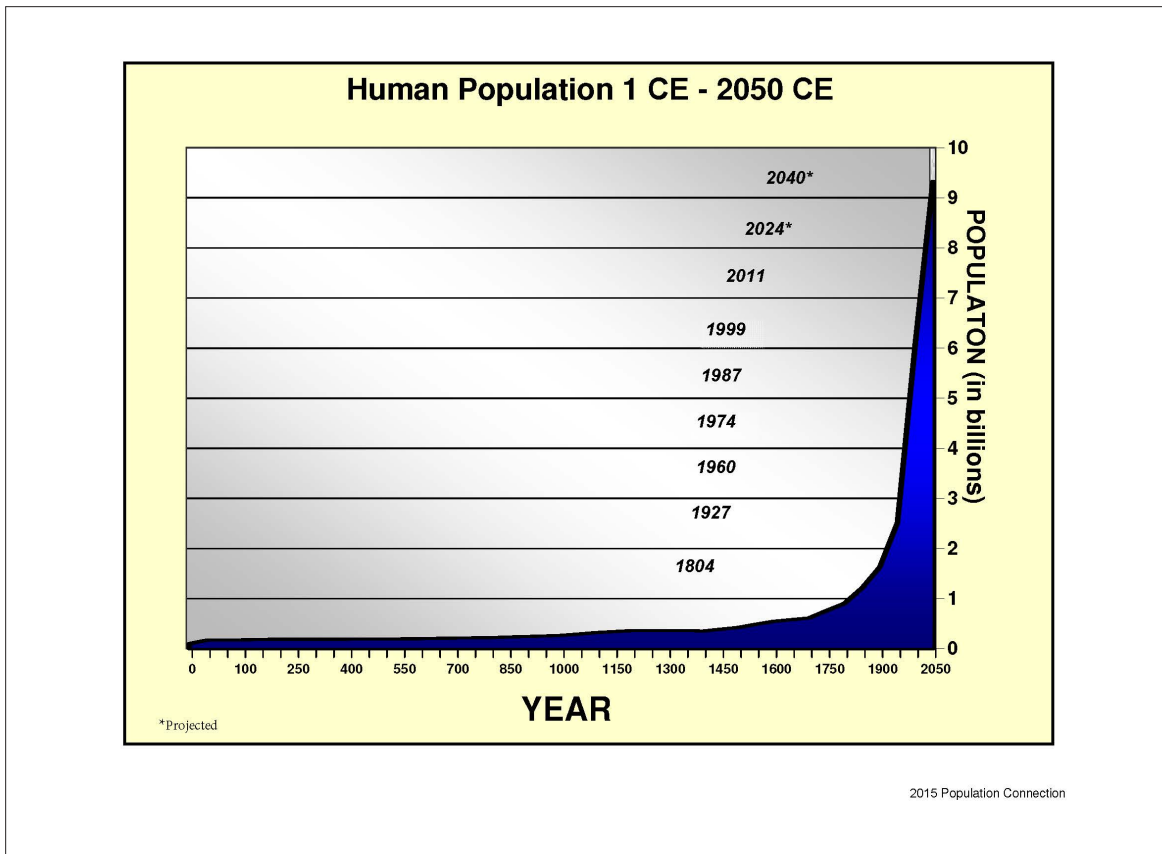
How does the quality of life on Earth vary now from what it was when there were half as many people? How might it be in the future when there are many more of us? How many people can the Earth support sustainably?

Crowding the Earth

No one knows for sure how many people the Earth can support. Every environment has a **carrying capacity** – the point at which there are not enough natural resources to support any more members of a given species. In *How Many People Can the Earth Support?* author Joel Cohen attempted to answer that very question by collecting dozens of expert estimates made in recent decades. Finding the Earth’s carrying capacity is difficult because the number of people the Earth can support depends greatly on how people use the Earth’s resources. Although estimates varied, Cohen was able to conclude from scholars that,

The possibility must be considered seriously that the number of people on Earth has reached, or will reach within the next century, the maximum number the Earth can support in modes of life that we and our children and their children will choose to want.³

World Population Growth 1000 AD-2050 AD*



The population issue, then, is not one of numbers but of carrying capacity. The entire world population could fit into Texas, and each person could have an area equal to the floor space of a typical North American home. But this ignores the amount of land required to provide each of us with the raw materials for survival (food, water, shelter, clothing, and energy) and all that has become essential to our modern lifestyles (transportation, electronic communication, and consumer goods and services). Scientists in Vancouver, Canada, tried to calculate local residents' **ecological footprint**, the land and water area that would be required to support the area's population and material standard indefinitely. They found that the Vancouver area's population requires an area 19 times larger than its home territory to support its present consumer lifestyles – wheat fields in Alberta, oil fields in Saudi Arabia, tomato fields in California.

While the continents are vast, only a small fraction (1/10) of all the land in the world is **arable**. The rest has been built up into cities and towns or is inhospitable to growing crops. While the number of people continues to grow, the small portion of land which must support these people remains the same or shrinks as cities expand. The size of the human population affects virtually every

environmental condition facing our planet. As our population grows, demands for resources increase, adding to pollution and waste. More energy is used, escalating the problems of climate change, acid rain, oil spills, and nuclear waste. More land is required for agriculture, leading to deforestation and soil erosion. More homes, factories, and roads must be built, occupying habitat lost to other species that share the planet, leading increasingly to their extinction. Simply put, the more people inhabiting our finite planet, the greater stress on its resources.

Meeting People's Basic Needs

This strain on Earth's finite natural resources makes it more difficult for people to meet their basic needs for food and clean water. Chronic hunger and malnutrition are already the greatest risks to health worldwide. One in seven people does not get enough food to be healthy and lead an active life. As the world population grows, it will be a challenge for food production to keep pace, yet we continue to lose arable land. About 35 percent of the world's people now face chronic water shortages. As the population grows, more water is needed for agriculture and industry, as well as for domestic uses. Meanwhile, as rapidly developing nations aspire to more affluent lifestyles, the demand for natural resources increases.

Population Growth: North American-style

With 98 percent of the population increase today occurring in developing countries, many North Americans feel that they neither contribute to nor are affected by the problem. In fact, the United States is the fastest growing industrialized country, growing by 2.6 million people each year. This is of particular concern to the global environment, as affluent lifestyles in North America place disproportionate demands on the world's resources and leave a much larger ecological footprint. While North Americans constitute just five percent of the world population, they consume 21 percent of the world's energy and produce 20 percent of the world's carbon dioxide emissions.

Evidence of population growth surrounds us – intensifying traffic congestion, urban and suburban sprawl, and landfill space too full to handle the mounting garbage and hazardous waste that North Americans create daily. In the last 200 years, the United States has lost 71 percent of its topsoil, 50 percent of its wetlands, 90 percent of its old-growth forests, 99 percent of its tallgrass prairie, and up to 490 species of native plants and animals with another 9,000 now at risk. We are currently developing rural land at the rate of nine square miles per day and paving a quarter of a million acres each year – an area larger than the size of New York City. Many attribute these problems solely to wasteful habits. However, as we in North America increase our population, we compound our ecological impact. Efforts to relieve environmental stress by cutting consumption would be undermined, if not negated, by continued population growth or by stabilization at a size larger than our resources can sustain.

In making their policy recommendations to the President Clinton in 1996, the President's Council for Sustainable Development (PCSD) stated clearly that "human impact on the environment is a function of both population and consumption patterns" and recommended policies to move toward voluntary population stabilization at the national level.

What Can Be Done?

There is much that can and has been done toward stabilizing the world population and preserving the

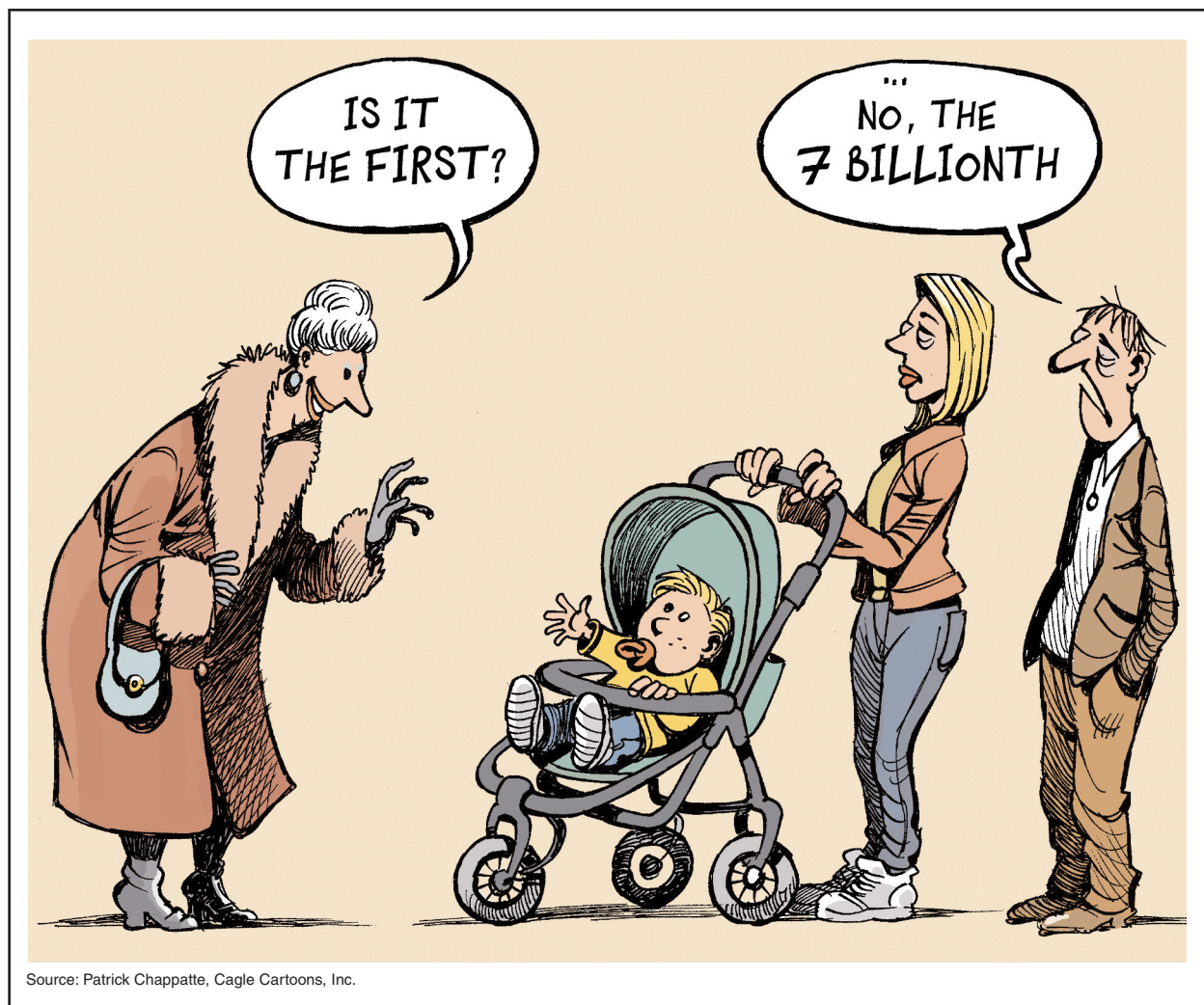
environment. It only takes very small changes in fertility rates (the average number of children born to each woman) to make a big difference in when the population will stabilize, as well as how many people there will be when that happens. According to the United Nations, a drop in the average number of children a woman has in her lifetime by half a child per woman could mean a difference of four billion people in the projected population for 2100! Recent trends show that the population growth rate has begun to decrease. Programs that expand access to health care, education, and family planning services that enable women to choose the timing and number of their children, as well as those that have improved the status of women and employment opportunities, all work to lower fertility levels. In 1960, the average woman gave birth to more than five children. Today, the average woman gives birth to 2-3 children.

However, these positive indicators do not mean that rapid population growth no longer poses a threat to the world's people and resources. High growth

World Population Clock, 2011			
2011 Population (est.)		World	United States
		6.6 billion	302 million
Births per:	Year	140,000,000	4,056,200
	Month	11,666,666	338,000
	Week	2,692,308	78,000
	Day	383,562	11,112
	Hour	15,206	463
	Minute	266	7.7
	Second	4.4	0.13
Deaths per:	Year	56,000,000	2,496,000
	Month	4,666,666	208,000
	Week	1,076,923	48,000
	Day	153,425	6,838
	Hour	6,393	285
	Minute	107	5
	Second	2	0.08
Natural Increase per:	Year	84,000,000	1,560,000
	Month	7,000,000	130,000
	Week	1,615,385	30,000
	Day	230,137	4,274
	Hour	9,589	178
	Minute	160	3
	Second	2.7	0.05

*These figures do not include net immigration, which is also a significant factor in U.S. population increase.
Source: U.S. Census Bureau, International Data Base

rates in recent decades mean that almost one-third of the world's people are under age 15 and have not yet entered their child-bearing years. This age structure means there is still potential for steady population increases and the need for international cooperation to continue successful programs. In order to achieve



Source: Patrick Chappatte, Cagle Cartoons, Inc.

zero population growth (stable population) while maintaining low death rates, average births will need to total only about two children per woman worldwide in the years to come.

Endnotes

¹ "2011 World Population Data Sheet," Population Reference Bureau, www.prb.org.

² *World Population Prospects: The 2010 Revision Population Database*, United Nations Population Division, <http://esa.un.org/unpp>.

³ Joel E. Cohen. *How Many People Can the Earth Support?* New York: W.W. Norton and Co., 1995.

⁴ William Rees and Mathis Wackernagel, *Our Ecological Footprint: Reducing Human Impact on the Earth* (Canada: New Society Publishers, 1996).

⁵ Food and Agriculture Organization of the United Nations, <http://faostat.fao.org>.

⁶ World Health Organization, www.who.int.

⁷ Matti Kummu, Water and Development Research Group, Aalto

University, Finland, www.environmentalresearchweb.org.

⁸ U.S. Department of Energy, Energy Information Administration, www.eia.gov.

⁹ The World Resources Institute, *The 1993 Information Please Environmental Almanac* (New York: Houghton Mifflin, 1993).

¹⁰ Rob Goldstein, "U.S. farmland being eaten away by development, govt. report shows," *Conservation Maven*, April 29, 2010, <http://www.conservationmaven.com/frontpage/us-farmland-being-eaten-away-by-development-govt-report-show.html>.

¹¹ Bruce K. Ferguson, *Porous Pavements*, CRC Press, 2005

¹² The President's Council on Sustainable Development, *Sustainable America: A New Consensus for Prosperity, Opportunity, and a Healthy Environment for the Future* (Washington, DC: U.S. Government Printing Office, 1996).

¹³ Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects, 2010 Revision* (New York: United Nations, 2011).

¹⁴ "2011 World Population Data Sheet."