



Extension FactSheet

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Population: A Reality

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There is no exception to the rule that every organic being naturally increases at so high a rate, that, if not destroyed, the earth would soon be covered by the progeny of a single pair. Even slow-breeding man has doubled in twenty-five years, and at this rate, in less than a thousand years, there would literally not be standing-room for his progeny.

— Charles Darwin (1809–1882), *On the Origin of Species by Natural Selection*, 1859

In hindsight, Darwin's observations of nearly 150 years ago appear to be prophetic. Global human population has doubled to six billion in the last five decades. It took humanity millions of years to build a population of two billion people, in contrast to the 46 years in which the second two billion appeared and the 22 years it has taken for the arrival of the third two billion. This population explosion has been precipitous in historical terms and can be defined as a trend rather than an event (See graph). According to demographers and experts, the struggle merely to support today's population at today's standard of living is causing environmental degradation on a scale and at a pace unprecedented in human history.

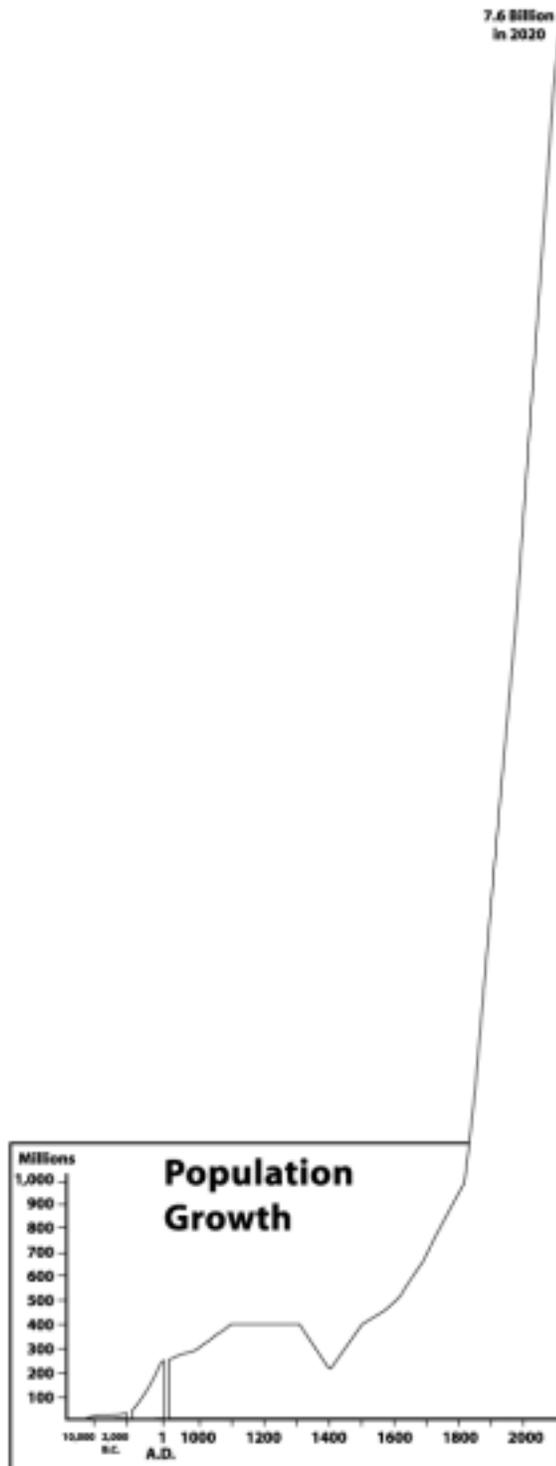
Scientists suggest that there is overpopulation when organisms (humans in this case) become so numerous that they degrade the ability of the environment to support their kind of animal in the future. The number of people Earth can support *in the long term* (without degrading the environment) — given existing socioeconomic systems, consumption patterns, and technological capabilities — is called the *human carrying capacity* of the planet at that time. This indicates that the study of population is not simply about population density, but also about the number of people in an area relative to its resources and the capacity of the natural environment to sustain human activities — the area's carrying capacity. The biophysical aspect of the carrying capac-

ity can be defined as the maximum population size that could be sustained under given technological capabilities. Likewise, social carrying capacity of a system can be described as the maximum population that could be sustained under a given social system and its associated pattern of resource consumption. It can thus be concluded that the critical difference between the terms *overpopulation* and *population density* lies in the amount of resources available and the number of human beings consuming them.

However, as population in a given area grows, demands for resources increase, which add to pollution and waste. More energy is used to support the population, resulting in increased global warming, acid rain, oil spills, and nuclear waste. More land is needed for agriculture, leading to loss of habitat for other species and potential propagation of these species. The impact of such activities may be far more serious than most people realize.

Environmental Impact

Population growth and its environmental and social impact know no national boundaries. Environmental degradation is compounded by lack of food security, soil losses, uneven distribution of the water supply, consumptive lifestyles, and many other socioeconomic factors leading to loss of biodiversity and natural resources.



Source: PBS web site (www.pbs.org) dated February 26, 2001.

It took humanity millions of years to build a population of two billion people. Then, in just 46 years, the population doubled, adding a second two billion, and in just 22 years, the third two billion arrived, bringing the total population to six billion.

Each year, an estimated 27,000 species of animals, plants, fungi, and microorganisms become extinct, taking their ecological services and genetic secrets with them. The world forests have been reduced from 11.4 to 7.3 square kilometers per 1,000 people since 1970. Current loss is concentrated in developing countries, mostly to clear land for cultivation in order to meet the demand for wood, paper, and other consumables by industrialized countries. This parallels the process of development historically, where forests have been clear-cut to make way for progress. For this reason, 17 per cent of the planet's soils, nearly 2 billion hectares, the size of China and India combined, have been severely degraded over the last 50 years. The ozone-layer hole over Antarctica was 13 times wider in 1991 than in 1981.

Consider just one natural resource — water and its distribution — in detail. The U.S. Agency for International Development (USAID) reports that 31 countries, accounting for 8 per cent of the world's population, currently face chronic water shortages. Even more alarming is the projection that by 2025, 48 countries will face similar shortages, affecting more than 2.8 billion people — 35 per cent of the world population. Approximately two thirds of the world's population lives in areas that receive only 25 per cent of the planet's rainfall. Spreading deserts and declining water tables in a third of the planet are contributing to famine, social unrest, and migration. Much of the world's fresh water is still inaccessible because it is trapped in polar ice caps.

Another point to note is that the amount of fresh water has not changed since dinosaurs roamed the planet. Although the world's supply of water remains constant, per-capita water consumption is rising twice as fast as world population. Humanity now consumes more than half of the available surface fresh water.

Another invisible but direct consequence of aggressive economic development is that market systems often subsidize industries such as logging, mining, and grazing without tallying environmental costs. No market considers commonly held resources such as groundwater levels or atmospheric and ocean quality. Nor do markets consider earth's "services" such as regulation of climate, detoxification of pollutants, or provision of pollinators, much less questions of human equity and social justice. Such "externalities" are often excluded from cost-benefit analysis, as it is not possible to put an exact price tag on them. Therefore, when water quality is degraded, well-off people can buy bottled water, but poor people cannot.

What Does the Future Hold?

The amount of food available restrains the size of any animal population, unless space, disease, predators, or some other factor sets lower limits. *Homo sapiens* is no exception to that rule, and at the moment, it seems likely that food will be our limiting resource.

Today some 700 to 800 million people, perhaps even as many as a billion, do not get enough food to support normal daily activities. And it is not for lack of trying, as in the areas where these people live, virtually all the reasonably arable land is being

farmed. Indeed, much that should not be cultivated has been, which in turn contributes greatly to statistics on land degradation from soil erosion and desertification. Only 11 per cent of the Earth consists of naturally arable land, and that area is diminishing due to erosion, salinization, and decline in the practice of fallowing land.

A country's birth rate is strongly linked to the extent of industrialization, economic development, availability of quality medical care and family planning services, the educational level of the population, and the status of women. According to the World Population Data Sheet of the Population Reference Bureau (1999), urbanization, higher level of education, expanding economic opportunities for women, and availability of contraception generally have more bearing on a person's family planning decisions than religious doctrine. Research has shown that socioeconomic factors may outweigh religion when it comes to reproductive choices. Increases in the income levels and education levels of women are inversely correlated with the number of children per family, lower total fertility rates, and lower infant and child mortality.

What Can We Do?

The Worldwatch Institute explains: "An economy's total burden on an ecological system that supports it is a function of three variables: the size of the population, average consumption, and the broad set of technologies — everything from dinner plates to communication satellites — the economy uses to provide goods and services."

Using this equation, the United States is the most overpopulated country in the world. In terms of energy consumption, the three million Americans added to the U.S. population every year is equivalent to 90 million Indians. Evidence is increasing that the combination of wasteful consumption patterns and ever-growing population is steadily degrading the natural resource base and impacting present and future generations need for a decent quality of life.

The consequences of overconsumption and population stress cross geographical boundaries. For example, the growing demand in the industrialized world for coffee, meat, fruits, and wood is transforming large tracts of tropical rainforests into croplands, grazing fields, and lumber. These, in turn, lead to soil erosion and increased use of pesticides and loss of habitat — and impact entire ecosystems.

So, if the effect of overconsumption and population growth is taking its toll on renewable and nonrenewable natural resources, is it at all possible for us to endure the impact and sustain the resources at the same time? The task may seem overwhelming as no single solution seems to be in sight. However, at an individual level, there are choices that we can make to slow down the outcomes. These include assuming responsibility for our own daily decisions rather than reproaching others.

The Challenge

Can Americans move away from waste and excess while still preserving the environment and high quality of life for both present and future generations? According to a report by Zero Population Growth (2001), the answer may rest with the ability to move toward a sustainable society, one that reduces wastefulness, is more energy-efficient, stabilizes its population, and defines happiness and well-being by more than materialistic pursuits. Providing incentives in the economic system to deal with sustainability, fine-tuning the growth side of the economic system, and changing consumption patterns may lead to a more sustainable future.

Researchers at Worldwatch Institute add that a shift in consumption patterns toward lower use of resources and towards high labor market could actually bolster the economy. For example, repairing products requires more labor than manufacturing, rail transit systems are more labor intensive than the auto industry, and organic farming employs more people than chemically dependent agriculture. These kinds of changes would increase employment while decreasing consumption. If then, consumption was practiced more carefully and individuals increased their savings, interest rates would rise — a traditional sign of a healthy economy.

Food for Thought

Envisioning a quality future may be an important first step toward achieving a sustainable society. At the same time, we need to bring about a change in the way we think about growth and progress, how we define happiness, and how much is enough. The decisions we make every day — how we get to work, what will we have for dinner, and what temperature should the thermostat be set to — may ultimately determine how we impact a sustainable and equitable future.

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