



Volume 4, Number 3

## World Population

**The United Nations International Conference on Population and Development was held in Cairo, Egypt from September 5-13, 1994.** This was the fifth in a series of international conferences on population since 1954, including Belgrade 1965, Bucharest 1974 and Mexico City 1984. This was the third under U.N. auspices.

Writing for *The Sciences* magazine, Nathan Keyfitz says, "One of the most vital matters facing humankind is the expansion of the population within a fixed natural ecology and the urgent need for the kind of economic growth which will relieve the stubborn poverty that still exists."

**There is a new urgency since exponential growth in both population and consumption is threatening the world's ability to develop in a sustainable manner.** Consider the fact that we are adding one billion people to the world's population every 12 years. Over the next 50 years the world's population is projected to soar from 5.6 billion to 9.6 billion, or more, and 96 percent of that growth will be in developing nations, primarily in the Southern Hemisphere.

**The rate of growth of the human population does not allow for sudden variations, except through widespread mortality crises or massive, authoritarian manipulation of fertility.** Compared with other animal species, human reproduction is slow, sexual maturity is late, fertility low and the number of old individuals large. All these factors give human population considerable inertia. Even in the unlikely event that we managed to immediately reduce world fertility to a level of simple replacement (on the order of two children per couple) and maintain this level in the future, the world population, due to the effects of its present age distribution and to the expected increase in life expectancy, would continue to grow for approximately a century before leveling off at a level which would almost double the present figure. Currently 32 percent of the population in developing nations is under the age of 15 and is coming into the reproductive stage.

**Countries in which people are well fed, in which infant mortality is low, in which women have access to education are countries in which the birth rate and the rate of increase are the lowest.** There is little doubt that development brings about a decline in the birth rate. However, the world's population is growing so fast that development alone is not going to be enough. There has been an ongoing debate about whether population control led to development or development led to population control. Clearly these two approaches have to work hand in hand. Family planning has to work together with economic development.

Components of Population	World - 1994
Births	139,324,000
Deaths	52,514,000
Natural Increase	86,810,000
Births per 1,000 population	25
Deaths per 1,000 population	9
Natural increase (percent)	1.5

## Ecological Sustainability

A society is ecologically sustainable when it:

- Conserves ecological life-support systems and biodiversity.
- Ensures that use of renewable resources is sustainable and minimizes the depletion of nonrenewable resources.
- Keeps within the carrying system of supporting ecosystems.

## The Threat is Real

**The greatest single threat to society, the economy, and the environment is human population growth.** The world population is growing at the rate of three people per second, 250,000 people per day, or 94 million per year (the population of Mexico).

### The "Progress" of Homo-Sapiens

Year	World Population
40,000 B.C.	3 million
8,000 B.C.	5 million
	<i>66% increase in 32,000 years</i>
Time of Christ	200 million
1650 A.D.	500 million
1850	1.3 billion
1945	2.3 billion
1994	5.6 billion
	<i>143% increase in 49 years!!!</i>

**China's population is projected to reach 1.54 billion in 2025, roughly equal to the entire world population in 1960.** In 2025 India's population is projected to equal that of China. India may have achieved its "green miracle" by overworking its croplands and depleting its watershed. Nigeria's population is expected to double to 180 million in the next 25 years. The earth is our production capacity and the earth's bounty is the production. When production exceeds production capacity for an extended period, the production capacity is diminished.

**The exponentially expanding world population demands more and more production, but production must be kept in balance with production capacity.**

**The pressure on natural resources increases with global consumption, which in turn depends on the average consumption and number of inhabitants.** this pressure can therefore be eased either by acting on population growth or by acting on consumption growth. If we look at particular areas, we realize that the demographic factor is important in developing countries, which have a reduced and generally slow-growing rate of consumption, while in the developed countries exactly the opposite happens.

**Thirty-two percent of the people living in developing countries are under 15 years of age and their fertility as adults will make an enormous difference to population growth rates in the next century and consequently to the availability of resources.**

**Since the per capita levels of consumption differ so widely between rich and poor countries, the paradox arises where every birth in the North puts as much pressure on resources as tens of births in the South.** This is the cause of a lot of North-South finger pointing. We in the North tell those in the South to get a grip on fertility and population growth. They look back and tell us to get a grip on consumption. Ironically, a case can also be made for a reduction of fertility in the North, something difficult to suggest since Northern countries have already reduced their birth rates to below replacement levels and it seems unlikely that they could go much further in this direction.

**Without addressing issues of equality and justice, then development goals that are ostensibly universal, such as the alleviation of poverty, the protection of ecosystems, and the creation of a balance between human activities and environmental resources, simply cannot be achieved.**

**If present trends continue, energy consumption and production of pollutants will double over the next 20 years.** Today, 20 percent of the world's population consumes 80 percent of the planet's resources and produces 80 percent of the global pollution. The real issue is not only the total number of persons, but the resources consumed and the pollution produced by each person. Population increases combined with consumption increases have serious human, economic, and environmental consequences.

## **A National Security Issue**

Undersecretary of State, Tim Wirth - Clinton's point man on population says, "We have some interest in maintaining a modicum of stability around the world. If populations grow so dramatically that there are millions of young people with no stake in what goes on in their society, that is an invitation to a kind of anarchy."

## **Potential for Anarchy**

**The cover of the February 1994 issue of Atlantic Monthly reads "The Coming Anarchy."** The rest of the cover reads, "Nations break up under the tidal flow of refugees from environmental and social disaster. As borders crumble, another type of boundary is erected - a wall of disease. Wars are fought over scarce resources, especially water, and war itself becomes continuous with crime, as armed bands of stateless marauders clash with the private security forces of the elites. A preview of the first decades of the twenty-first century. By Robert Kaplan."

Kaplan writes that environment is the national security issue of the 21st century. "The political and strategic impact of surging populations, spreading disease, deforestation, soil erosion, water depletion, air pollution, and possible rising sea levels in critical overcrowded regions that will prompt mass immigrations and in turn incite group

conflicts - will be the foreign policy change from which most others ultimately emanate, arousing the public and uniting assorted interests left over from the cold war. Environmental scarcity will inflame existing hatreds and affect power relationships at which we now look. Surging populations lead to environmental degradation which leads to ethnic conflict."

**West Africa provides an appropriate introduction to the issue, often extremely unpleasant to discuss, that will soon confront our civilization.** Disease, overpopulation, unprovoked crime, scarcity of resources, refugee migrations, the increasing erosion of nation-states and international borders, and the empowerment of private armies, security firms, and international drug cartels are now most tellingly demonstrated through a West African prism. Consider Nigeria now with a population of 90 million including that of its largest city Lagos whose crime, pollution, and overcrowding make it the cliché par excellence of Third World urban dysfunction. The population of Nigeria is projected to double in the next 25 years while the country continues to deplete its natural resources. As the burgeoning populations deplete the resources they move to the city and become the urban poor.

**Polygamy continues to proliferate in sub-Saharan Africa boosting the birth rate, the spread of the AIDS virus, and both deforestation and desertification, which in turn drives people to the cities to live in slums. Of the estimated 12 billion people in the world who are HIV positive, 8 billion are in Africa.**

## **Water Quality and Population**

One of the gravest threats to water quality as a result of overpopulation is the spread of waterborne disease, especially in tropical countries. Some 25,000 people die every day from diseases carried by polluted waters such as cholera, typhoid and dysentery.

Water is a finite resource - the global water cycle remains constant. The amount of global fresh water, approximately .5 percent of the total water on earth has not increased since the beginnings of civilization. Yet population increases caused world water use to double between 1900 and 1950 and double again by 1990. In addition to causing immediate shortages, intense usage pressure severely damages water resources. Aquifer depletion, lowered water tables and saltwater intrusion decrease the amount of water suitable for human use.

Water resources do not limit population growth. Rather, they limit the level of economic development or living standards achievable.

A sustainable society enables its members to achieve a high quality of life in ways that are ecologically sustainable.

As urban concentrations in developing countries intensify, the amount of human waste increases while the ability to provide proper treatment and disposal decreases. Water pollution by human waste is widespread and water borne disease accounts for 80 percent of all child deaths in developing countries.

If we do not look beyond short-term profits and political boundaries to solve a pending world water crises, the results will be devastating and potentially irreversible. Mass drought, starvation and political upheaval will be a given in the semi-arid third world, globally, the results will be the extermination of wildlife and habitat, toxic contamination of drinking water supplies, loss of critical farmland and a deteriorating quality of life for all.

**Oil was the fluid of the 20th Century. Water will be the fluid of the 21st Century.**

## **The Concept of Carrying Capacity**

The population size of most organisms is usually controlled by the availability of a few key resources that limit its ability to survive and reproduce. When these resources are abundant, the population of the species normally experiences population growth as consumption facilitates health and reproduction. If the resources are over-consumed, the population of the species will experience a decline in the number of individuals because resource scarcity leads to starvation and death. The population size of most species reaches a steady state equilibrium that is defined by the availability of the limiting resources in its habitat. This equilibrium is also called the carrying capacity. Humans populations are also influenced by a habitat's carrying capacity. In 1845, a fungus infection significantly reduced the yield of potatoes in Ireland. Potatoes were one of the key resources that supported the human population in this country. Because of the reduction in yield, the supply of potatoes for consumption became scarce and caused about 1 million people to die of starvation and about 3 million Irish people to emigrate to other countries.

Our use of technology has greatly extended the Earth's carrying capacity for humans. Prior to the Industrial Revolution, the size of the human population was less than 1 billion people. The advent and use of various forms of technology during and after the industrial revolution quickly inflated the human carrying capacity of the Earth. The human population is now almost 6 billion people and is predicted to level off at 9.3 billion in the year 2050. Some scientists believe that the Earth may not be able to maintain even the current size of the human population in the future because of environmental degradation. Many of the technologies that have allowed for the expansion of the human population are unsustainable in the long-term. When these unsustainable technologies fail, the carrying capacity of the Earth for humans will be reduced possibly leading to starvation and death. For example, fossil fuels have been responsible for much of increase in the world's ability to grow crops. Fossil fuels have been used to increase the area cultivated through the use of machines, they have been used to produce nitrogen fertilizers, and they are used to transport and process the products of industrial agriculture. However, fossil fuels are finite in quantity and a reduction in their availability will most likely cause reductions in agricultural yield.

[Source: [http://www.geog.ouc.bc.ca/conted/onlinecourses/geog\\_210/210\\_1\\_2.html](http://www.geog.ouc.bc.ca/conted/onlinecourses/geog_210/210_1_2.html)]

**Advanced Industrial Societies** are characterized by the following changes to human society that may have a negative effect on the supply of resources and can result in environmental degradation:

- Increased production and consumption of goods by humans, stimulated by mass advertising.
- Dependence on nonrenewable resources such as oil, natural gas, coal, and various metals.
- Production of synthetic materials, many of which break down slowly in the environment. Some of these materials can also be toxic to life.
- High use of energy for transportation, manufacturing, agriculture, lighting, heating and cooling.

Many of the changes to the human condition because of industrialization have positive benefits. The **benefits** of an Advance Industrial Society include:

- Creation and mass production of many useful and economically affordable products.
- Significant increases in average **GNP** per person.
- A sharp increase in agricultural productivity.
- A sharp rise in average life expectancy from improvements in sanitation, hygiene, nutrition, medicine, and birth control.
- A gradual decline in the rate of population growth.

[Source: [http://www.geog.ouc.bc.ca/conted/onlinecourses/geog\\_210/210\\_1\\_3.html](http://www.geog.ouc.bc.ca/conted/onlinecourses/geog_210/210_1_3.html)]

## Methods for Controlling Human Populations

Populations stop expanding when either (a) the death rate rises to equal the birth rate, or (b) the birth rate declines to the level of the death rate. Artificially increasing death rates is not currently seen as a viable approach to

population control. Countries can, however, impose policies to reduce their birth rates. Today, more than 90 % of the world's population lives in countries that have programs to reduce birth rates. Demographers have generally recognized three different methods for achieving a reduction in the growth of a population. These methods are:

- Economic Development
- Family Planning
- Socioeconomic Change

**Economic development** - as discussed in the previous section, demographers have noticed that economic development usually leads to a reduction in a nation's population growth rate. This reduction is the result of many different factors that are tied into economic prosperity. In general, a higher standard of living reduces the desire for couple to have children because:

- Both sexes are usually actively engaged in the work force;
- Advance economies offer pension income at retirement;
- The cost of raising a child are high;
- Children are not considered as part of the family labor force; and
- Education and employment training delays the time when couples begin having children.

**Family planning** - involves any program that provides educational and technological services that help individuals to plan the birth of children. The nature of family planning varies from country to country because of differences in economic development, religion, and culture. Family planning has been very important in reducing birth rates in less developed countries like: China, Indonesia, Brazil, Barbados, Cuba, Columbia, Costa Rica, Fiji, Hong Kong, Jamaica, Mauritius, Mexico, Thailand, Singapore, South Korea, Taiwan, and Venezuela. In the remaining LDCs, family planning programs have not been successful because of economic, religious or cultural reasons. For example, India started to provide family planning programs for its people beginning in 1952 when its population was about 400 million. However, these programs generally failed because of poor planning, lack of social security, gender inequalities, and under-funding. Today, India's population is approaching 930 million.

**Socioeconomic change** - some nations have used economic incentives to reduce fertility rates. For example, China's "one child policy" gives couples economic rewards for having fewer children. These rewards include: salary bonuses, extra food, bigger pensions, improved housing, increased medical care, and school tuition for the child. [Source: [http://www.geog.ouc.bc.ca/conted/onlinecourses/geog\\_210/210\\_3\\_7.html](http://www.geog.ouc.bc.ca/conted/onlinecourses/geog_210/210_3_7.html)]

## Different Opinions

**Economists have a lot more faith in science and technology to accommodate more and more growth than scientists do.** Looking back at previous international population conferences, it is clear that by 1954 the chief question was whether development would by itself lead to population control, or would population control be required before development could take place.

**The central focus of modern economics is on growth, the idea that increasing productivity brings employment and prosperity.** With sufficient economic growth population growth is not to be feared. The resulting wealth, economist maintain, will in turn counteract the incidental ill effects of growth. Biologists, on the other hand, see the economy as embedded in a fragile ecosphere, upon which growth acts in dangerous, inscrutable ways. The two groups agree that sooner or later both the number of people in the world and the amount of goods those people produce/consume will have to stop increasing. Beyond that, however, economists and biologists diverge radically on some fundamental questions to include:

- How urgent is it that population growth and rising productivity be curtailed?
- What sacrifices in checking growth are acceptable?

- With development, family size will eventually fall and sooner or later human population will stabilize. Is it safe to let the process take care of itself?

**"The sooner population growth ceases, the more time humanity has to redress the mistakes of past growth, the more resources it has to implement solutions, and the more options it has to decide how it wants to live in the future."** - Ronald G. Ridker, World Bank

## Options for Curbing Population Growth

Option 1: Apocalypse	Option 2: Family Planning	Option 3: Development
War	Education	Human Condition as Measured by:
Drought	Birth Control	Human Development Index
Famine	∨	&
Disease	- Contraceptives	Human Equality Index
Pestilence	- Sterilization	(see below)

**Option #1 is inhumane.** Unfortunately, on our current path it is an option which is being exercised on a regular basis and one which will account for increasingly more deaths. Many zealots even think catastrophic events are desirable or "God's will."

**Option #2 is a highly charged one involving individual values, women's rights, and religious beliefs.**

Abortion is commonly used for birth control, when other kinds are not available. This option brings up the debate over whose fertility is being controlled and how that influences the political/racial/ethnic/religious mix. Leaders of most developing nations accept the need for family planning, but suspicions of ulterior motives never lurk far beneath the surface.

**Option #3 is much less controversial.** Ecologically sustainable and socially acceptable economic development is a choice that everyone can be for. That is what sustainable development is all about, "meeting the needs of the present without compromising the ability of future generations to meet their own needs." It's about a vision where we live in harmony with nature and each other. The record shows that education and empowerment reduce fertility rates and population growth.

**It is quite obvious that Options #2 and #3 will have to work in concert if we are going to head off Option #1 and if we are going to win the race, the human race to a sustainable society.**

## Quality of Life

*As measured by the United Nations Development Programs Human Development Index (HDI)*

- **Longevity**, measure by life expectancy at birth. Long life is valued because it increases the opportunity for a person to pursue goals and develop abilities and is associated with good health and adequate nutrition.
- **Knowledge**, or educational attainments measured by adult literacy and mean years of schooling. This helps people to realize their potential and take advantage of opportunities.
- **Income**, measured by per capita Gross Domestic Product, adjusted to account for national differences in purchasing power and the distorting effect of official exchange rates (real GDP) and adjusted further to reflect diminishing returns from income.

In a previous Eco-Link (Volume 4, Number 1) we pointed out that almost everything that reduces population growth is considered bad which obviously creates a dilemma. What option(s) would you chose for bringing the population under control?

## Family Planning

When serving as Director For US Agency for International Developments' Office of Population, R.T. Ravenholt, M.D. wrote a concise statement of "AID'S Family Planning Strategy," which concluded:

"Regardless of what special social measures may ultimately be needed for optimal regulation of fertility, it is clear that the main element initially in any population planning and control program should be the extension of family planning information and means to all elements of the population. It seems reasonable to believe that when women throughout the world need reproduce only if and when they choose, then the many intense family and social problems generated by unplanned, unwanted, and poorly cared for children will be greatly ameliorated and the now acute problem of too rapid population growth will be reduced to manageable proportions."

**In a paper titled "America's Shattered Child Plague" presented to Peninsula College in Port Angeles, Washington, Dr. Ravenholt writes, "Two fundamental precepts must guide reproduction in every sound society; first every child should be a wanted and well-cared-for child; second, no one should reproduce beyond their means of providing for their off-spring.**

Writing for the Free Inquiry Journal, Dr. Ravenholt, who is now president of Population Health Imperatives in Seattle, says, "throughout human experience until quite recently, tribal and species survival needs dictated that women reproduce with little or no constraint. But as scientific knowledge and its products evolved with accelerating speed during the 19th and 20th centuries, death rates fell. Consequently, an urgent need arose to reduce population growth to levels commensurate with available resources, in accordance with the developmental condition equation:

According to John Bongaarts of the Population Council in New York City, education, occupation, wealth, location, religious belief and social status are indirect determinants of fertility. Because they are indirect, their effect on fertility is difficult to interpret. Of the direct influences, the most powerful is family planning. Bongaarts says, "a country's contraceptive prevalence rate - the percentage of married women of reproductive age who use any contraception - largely determines its fertility rate." The data also confirms that better educated women are more likely to practice some form of contraception than are women with little or no education.

### \*Total Fertility Rate World

1965-70	6.1
1980-85	4.2
Current Level (1994)	3.1
Replacement Level ZPG	2.1

Source: Resources for the Future

\*Total Fertility Rate: The numbers of children women are expected to have over their reproductive years (e.g. ages 15-49).

## Demographic Transitions

An article titled "The Fertility Decline in Developing Countries" appeared in the December 1993 edition of the Scientific American. The article says, "demographic transition theory holds that societies are initially characterized by high fertility and high mortality, population does not grow. This phase is followed by an intermediate stage in

which modernization begins and mortality is reduced but fertility remains high. This period is one of rapid population growth, only later does fertility decline. The last era, one of stable population growth, low mortality and fertility, describes most of the developed world." The article goes on to say, "The recent decline in fertility rates among developing countries does not fit this theoretical framework well with respect to timing or circumstance. Fertility rates in developing countries have fallen much more rapidly than they did during the European demographic transition. The findings dispute the notion that "development is the best contraceptive," a phrase that originated at the 1974 World Population Conference in Bucharest. This view held that fertility would not drop until developing economies improved."

**The differences between fertility declines in developing countries today and those seen in Europe may be best explained by differences in the approaches to family planning.** During the West's demographic transition, modern contraceptives were not yet invented, and the concept of family planning was not quickly accepted. The availability of effective contraception gives developing countries a major advantage over the European societies that underwent fertility declines earlier.

## Survival of the Fittest?

**In the closing words of *The Origin of Species*, Charles Darwin clearly identifies evolution with virtually unstoppable progress. He writes, "As natural selection works solely by and for the good of each being, all corporeal and mental environments will tend to progress toward perfection."** Modern biologists, however, find thoroughly unacceptable the 19th century view that the earth's history has been an inexorable march toward the goal of contemporary humanity. As the geologist and paleontologist Stephen J. Gould of Harvard has written, "This common scenario is fiction rooted in traditional hopes for progress and predictability."

**To a large extent we have freed ourselves from natural selection or survival of the fittest in the traditional sense. We are not well equipped to live in the wild, yet we can live wherever we want, and we can push any other creature out of its niche if we so choose.** We have controlled death to the point where our birth rate far exceeds our death rate which accounts for runaway population growth. We have no predator to worry about except ourselves. We have developed technology to carry us to the moon and back (significant in biological terms as well as scientific terms). We are the only species that can visualize our future. We need to use that vision and the technology we have developed to achieve a sustainable society.

*There is no doubt about the fact that we humans are the most highly evolved creatures on earth, with brains enormous for our body size. Yet, in a world estimated to be some 5 billion years old...we just got here. Our first known ancestor is "Lucy," a female who lived on the African continent, lived just 3.2 million years ago, a blink in time considering that there were 65 million years between the dinosaurs and our arrival. Where we go from here is up to us.*

## What Can We Do?

**Because tomorrow's parents have already been born and the impacts of fertility decline won't be felt for several decades, the world has to prepare itself to cope with a global population of eight billion in 2020.** Therefore, the measures to be taken must not be confined to the sole objective of reducing fertility. Some other things we can do are:

- Preserve the dignity of the family and each of its members.
- Reduce consumption of natural resources and consumer goods.
- Give priority to investments in basic health services, sanitation and clean water.
- Make information and education accessible to all, including women.
- Protect women from coercion, maltreatment and sexual violence.

**"Achieving and maintaining a sustainable relationship between human populations and the natural resource base of the earth is the single most critical long-term issue facing the peoples of the world and this issue will increasingly be the focus of international affairs for the foreseeable future."** - Russell E. Train, World Wildlife Fund

## Did You Know?

- Every year farmers around the world are trying to feed 90 million more people with 24 billion fewer tons of topsoil.
- Desertification (i.e. land turning to desert) from overgrazing and inefficient farming methods is taking 15 million acres out of use each year.
- Increasing demand for fresh water has diminished our supplies by trillions of gallons above and below ground. In several regions of Northern China, water tables are falling by 12-15 feet per year. Parts of Mexico City are sinking as underground aquifers are pumped dry.
- With half of the world's population under 25 years of age, even the most vigorous policies will not eliminate rapid population growth and the accompanying need for large increases in production.
- Over 1.3 billion people lack access to safe drinking water, 880 million adults cannot read or write, 770 million lack sufficient food for an active working life, and 800 million live in "absolute poverty," lacking even the most rudimentary necessities. Each year about 14 million children, about 10 percent of the children born annually, die of hunger.
- World infant mortality is currently 65 per 1,000 live births.
- Approximately 75 percent of all the illiterate people in the world are women who have been denied education opportunities.
- An estimated 500,000 women die of pregnancy related deaths each year, and at least 250,000 women die each year from unsafe abortions.
- In the United States in 1991 there were 1,213,769 births to unmarried women, of which 357,483 were to adolescents ages 15-19.
- There are 1.6 million abortions per year in the United States.
- The average woman in Russia has 7-8 abortions in her lifetime.
- Ignoring the facts won't make them go away...

## Glossary

**Birth Rate:** The average number of births per year per 1,000 populations at midyear. Also known as crude birth rate.

**Component Method:** A method of estimating or projecting population change (fertility, mortality and migration are used).

**Contraception:** Deliberate use of methods to prevent conception or pregnancy. Also known as family planning.

**Contraceptive Prevalence Rate:** The percentage of currently married women of reproductive age (15-49) who use a method of contraception.

**Death Rate:** The average number of deaths per year per 1,000 populations at midyear. Also known as crude death rate.

**Growth Rate:** The average annual percent change in population resulting from a surplus (or deficit) of births over deaths and the balance of migrants entering and leaving a country.

**Infant Mortality Rate:** The number of deaths to infants under one year of age in a given year per 1,000 live births in the same year.

**Total Fertility Rate:** Births expected per woman during her reproductive years (15-49).

**Vital Events:** Births and deaths.

One of the guiding principles directing the vision of the Temperate Forest Foundation is, Quality of Life for all People. All people deserve to have their basic needs met, they need dignity, justice and equality, and last but not least.....they should have a chance to reach their human potential. Exponential population growth threatens everyone's quality of life.

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## Population and the Environment

- The link between population growth and environmental impact seems obvious at first glance: more people consume more resources, damage more of the earth and generate more waste. Humans are a force of nature. As nations develop, they increase consumption. This simple reasoning is true as far as it goes, but the larger picture is more complex.
- · A very small proportion of the population consumes the majority of the world's resources. The richest fifth consumes 86% of all goods and services and produces 53% of all carbon dioxide emissions, while the poorest fifth consumes 1.3% of goods and services and accounts for 3% of CO<sub>2</sub> output. (1)
- · Per capita municipal waste grew 30% in developed nations since 1975 and is now two to five times the level in developing nations. (1)
- · An average American's environmental impact is 30 to 50 times that of the average citizen of a developing country such as India. (1)
- The need is to balance the requirements of a growing population with the necessity of conserving earth's natural assets.

- Human action has transformed between one-third and one-half of the entire land surface of the earth. We have lost more than one-quarter of the planet's birds, and two-thirds of the major marine fisheries are fully exploited, over-exploited or depleted. (2)
- · Every 20 minutes, the world adds another 3,500 human lives but loses one or more entire species of animal or plant life - at least 27,000 species per year. This is a rate and scale of extinction that has not occurred in 65 million years. (3)
- · Spreading deserts and declining water tables in a third of the planet are contributing to famine, social unrest and migration.
- · Two thirds of the world's population lives within 100 miles of an ocean, inland sea or freshwater lake: 14 of the world's 15 largest megacities (10 million or more people) are coastal. Their impacts include growing loads of sewage and other waste, the drainage of wetlands and development of beaches, and destruction of prime fish nurseries. (4)
- Technological advances can mitigate some of the impact of population growth, and market mechanisms raise prices for some diminishing resources, triggering substitution, conservation, recycling, and technical innovation so as to prevent depletion.
- But 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. When water quality is degraded, well-off people can buy bottled water, for example, but poorer people cannot..
- · A world conclave of 58 national Academies of Science agreed in 1993 that unchecked consumption and rapid population growth are likely to overwhelm technological improvements in affecting the environment. (5)
- Clearly, the greatest environmental threat comes from both the wealthiest billion people, who consume the most and generate the most waste, and from the poorest billion, who may damage their meager resource base in the daily struggle to avoid starvation. In addition, the billions in between are doing their best to increase their standard of living, in part through increased consumption.
- · Although the world's supply of water remains constant, per-capita water consumption is rising twice as fast as world population. Humanity now uses more than half of the available surface fresh water on earth (2); at least 300 million people live in regions that already have severe water shortages. By 2025, the number could be 3 billion. (6)
- · The world's forests have shrunk from 11.4 to 7.3 square kilometers per 1,000 people since 1970. The loss is concentrated in developing countries, mostly to meet the demand for wood and paper by the industrialized world. Wild species are becoming extinct 50 to 100 times faster than they naturally would. (1)
- · Over the last 50 years, 17% of the planet's soils have been severely degraded. That's nearly 2 billion hectares, the size of China and India combined. (1)
- · The global emission of carbon dioxide, a "greenhouse gas" most researchers say causes global warming and disruption in weather patterns, has quadrupled since 1950, largely from deforestation and the burning of fossil fuels. The atmosphere now contains 30% more CO<sub>2</sub> than at the beginning of the industrial revolution. (2) Where the industrialized world produces 60% of it today, the developing world will be producing 60% of it by 2015.(1)

**Sources:** (1)United Nations Development Programme, Human Development Report 1998 (New York: Oxford University Press, 1998); (2) Jane Lubchenco, past president, American Association for Advancement of Science, speech: "Women, Population and Science in the New Millennium," Dec. 1, 1998, AAAS, Washington DC. (3) Ken Strom, Population and Habitat in the New Millennium, National Audubon Society and The Global Stewardship Initiative (Boulder CO 1998); (4)Population Action International, Why Population Matters (Washington DC: PAI, 1996); (5)Report, Population Summit of the World's Scientific Academies (Washington DC: The National Academy Press, 1993); (6)Simon, Paul, Tapped Out (New York: Welcome Rain Publishers, October 1998). Developed by World Population Foundation and the Communications Consortium Media Center, with editorial contributions from the U.S. NGOs in Support of the Cairo Consensus.

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