

# 6

## Human Population

### Chapter Objectives

**This chapter will help students:**

Assess the scope of human population growth

Evaluate how human population, affluence, and technology affect the environment

Explain and apply the fundamentals of demography

Outline and assess the concept of demographic transition

Describe how wealth and poverty, the status of women, and family planning programs affect population growth

### Lecture Outline

**I. Central Case: One-Child Policy**

A. The People's Republic of China is the world's most populous nation, home to one-fifth of the 6.7 billion people living on Earth at the start of 2006.

B. Under Mao Zedong's leadership, which began in the 1950s, improved food production and distribution and better medical care allowed China's population to swell, causing environmental problems as water was depleted, forests leveled, and the air polluted.

C. The government instituted a population-control program in the 1970s.

1. The program started with education and outreach efforts encouraging people to marry later and have fewer children, and increasing the accessibility of contraceptives and abortion.

2. By 1976, China's annual population growth dropped to 1.8%.
  3. In 1979, the government decided to institute a system of rewards and punishments, enforcing a one-child limit per family.
- D. China's growth rate is down to 0.6%; however, there have been unintended consequences of the program, such as widespread killing of female infants and an unbalanced sex ratio.

## II. Human Population Growth: Approaching 7 Billion

A. The human population is growing nearly as fast as ever.

1. The human population has doubled since 1964.
2. We can estimate doubling time of a population by taking the number 70 and dividing it by the annual percentage growth rate. For example: If China's annual percentage growth rate is 2.1%, then dividing 70 by 2.1 shows a doubling time of just 33.3 years.

B. Is population growth really a "problem"?

1. Our ongoing burst of population growth has resulted largely from technological innovations, improved sanitation, better medical care, increased agricultural output, and other factors that have led to a decline in death rates, particularly a drop in the rates of infant mortality.
2. There are many people today who deny that population growth is a problem.
3. Under the Cornucopian view, resource depletion as a consequence of greater numbers of people is not a problem if new resources can be found to replace depleted resources.
4. Environmental scientists argue that not all resources are replaceable by others once they are depleted, and that few resources are actually created by humans.
5. Even if resource substitution could enable indefinite population growth, could we maintain the quality of life that we would desire, or would our descendants have less space, less food, and less material wealth than the average person does today?
6. Many governments have found it difficult to let go of the notion that population growth increases a nation's economic, political, or military strength.

C. Population is one of several factors that affect the environment.

1. The **IPAT model** represents how humans' total impact (I) results from the interaction among three factors—population (P), affluence (A), and

technology (T):  $I = P \times A \times T$ .

2. A sensitivity factor (S) can be added to the equation to denote how sensitive a given environment is to human pressures:  $I = P \times A \times T \times S$ . Terms can also be added for the effects of social institutions such as education, laws and their enforcement, stable and cohesive societies, and ethical standards that promote environmental well-being.
3. Modern-day China shows how all elements of the IPAT formula can combine to result in tremendous environmental impact in very little time.

### III. Demography

1. The principles of population ecology apply to humans.
2. Environmental factors set limits on our population growth, and the environment has a carrying capacity for our species, just as it does for every other.
3. Estimates of the human carrying capacity range from 1–2 billion people living prosperously in a healthy environment to 33 billion living in extreme poverty in a degraded world of intensive cultivation without natural areas.

A. **Demography** is the study of human population.

1. The application of population ecology principles to the study of statistical change in human populations is the focus of the social science of demography.
2. Population size is the absolute number of individuals.
3. Population density and distribution show that humans are very unevenly distributed over the globe.
  - a. This uneven distribution means that certain areas bear far more environmental impact than others.
  - b. At the same time, areas with low population density are often vulnerable to environmental impacts. The reason they have low populations may be that they are sensitive and cannot support many people.
4. Age structure or age distribution of human populations divides the population by sex and age categories.
  - a. The major divisions include those below reproductive age, those currently of reproductive age, and those past reproductive age.



3. Demographic transition is a model of economic and cultural change that explains the trend of declining death rates and birth rates that occurs when nations become industrialized.
4. The first stage, the **pre-industrial stage**, is characterized by conditions in which both death rates and birth rates are high.
5. In the next stage, the **transitional stage**, death rates decline and birth rates remain high.
6. The **industrial stage** creates employment opportunities, particularly for women, causing the birth rate to fall.
7. In the final stage, the **post-industrial stage**, both birth rates and death rates remain low and populations stabilize or decline slightly.
8. This transition has occurred in nearly all developed nations over the past 200–300 years.
9. It may or may not apply to all of the developing countries depending on their culture, especially if they place greater value on childbirth or grant women fewer freedoms.

#### **IV. Population and Society**

##### **A. Women's empowerment greatly affects population growth rates.**

1. Drops in TFR have been most noticeable in countries where women have gained improved access to contraceptives and education, particularly family-planning education.
2. Unfortunately, many women still lack the information or personal freedom of choice to allow them to make their own decisions about when to have children and how many to have.
3. In societies in which women are freer to make reproductive decisions, fertility rates have fallen, and the resulting children are better cared for, healthier, and better educated.

##### **B. Family-planning programs are working around the globe.**

1. The government of Thailand has relied on an education-based approach to family planning that has reduced birth rates and slowed population growth.
2. India has had long-standing policies, but some think they need to be strengthened.
3. Brazil, Mexico, Iran, Cuba, and many other developing countries have instituted active programs consisting of population reduction targets, incentives, education, contraception, and reproductive health care.

4. In 1994, the United Nations hosted a conference in Cairo on population and development, in which 179 nations endorsed a platform calling for all governments to offer universal access to reproductive health care within 20 years.

C. Poverty is strongly correlated with population growth.

D. Consumption from affluence creates environmental impact.

1. Individuals in affluent societies leave a larger ecological footprint.

2. The “population problem” does not lie entirely with the developing world. Just as population is rising, so is consumption, and environmental scientists have calculated that we are already living beyond the planet’s means to support us sustainably.

E. The wealth gap and population growth contribute to conflict.

1. The richest one-fifth of the world’s people use 86% of the world’s resources, and possess over 80 times the income of the poorest one-fifth.

2. Earth does not hold enough resources to sustain all 6.5 billion of us at the current North American standard of living, nor can we go out and find extra planets; so, we must make the best of the one place that supports us all.

## **V. Conclusion**

1. Although global populations are still growing, the rate of growth has decreased nearly everywhere.

2. There has been progress in expanding rights for women worldwide. In addition to the clear ethical progress of this development, it also helps to slow population growth.

3. True sustainability demands that we stabilize our population size in time to avoid destroying the natural systems that support our economies and societies.