

## **Patterns of Resource Use**

Humans have always made an impact on the environment through their use of resources. Early humans were primarily hunter-gatherers who used tools to survive. They fashioned wood and stone tools for hunting and food preparation, and used fire for cooking. Early humans developed methods for changing habitat to suit their needs and herding wild animals. As time passed, humans developed more tools and techniques and came to rely on that technology in their daily lives. Although the tools of early humans were primitive by today's standards, they significantly affected the environment and probably hastened the extinction of some large Ice Age mammals.

After the end of the last Ice Age, some eight to 10,000 years ago, humans began domesticating wild animals and plants. The first known instance of farming started in a region extending from southeastern Turkey to western Iran, known as the fertile crescent.

These early farmers domesticated crops such as chickpea, bitter vetch, grapes, olives, barley, emmer wheat, lentils, and flax. They hybridized wheat for making bread from wild grass and emmer wheat. They also domesticated animals such as sheep, goats, cattle and pigs. The fertile crescent's unique diversity of wild crops and animals offered humans a mix of basic agricultural commodities that allowed a revolution in the development of human society. With a reliable food supply, humans were able to stay in one place and be assured of having a constant supply of carbohydrates, protein, milk and oil. They had animals for transportation and plant and animal materials for producing clothing and rope. Agricultural economies soon displaced hunter-gatherer economies. Within 2,000 years, farming ranged from Pakistan to southern Italy.

Most early agriculture was subsistence farming in which farmers grew only enough food to feed their families. Agriculture underwent another important revolution about 5,000 years ago with the invention of the plow.

The plow allowed humans to clear and farm larger plots of land than was otherwise possible. This increased the food supply and a concomitant increase in human population growth. More efficient farming methods also resulted in urbanization because a few farmers could produce a large surplus of food to feed those in the urban areas.

Over the last 10,000 years, land clearing for agriculture has destroyed and degraded the habitats of many species of plants and animals. Today, growing populations in less developed countries are rapidly clearing tropical forests and savannas for agricultural use. These tropical rainforests and savannas provide habitat for most of the earth's species. It has become clear that modern agricultural practices are not sustainable. Once-fertile areas are becoming infertile because of overgrazing, erosion and nutrient depletion. Furthermore, modern agriculture requires large inputs of energy and fertilizers, usually produced from nonrenewable fossil fuels.

The next major cultural change, the Industrial Revolution, began in England in the mid-18th century. It involved a shift from small-scale production of goods by hand to large-scale production of goods by machines. Industrial production of goods increased the consumption of natural resources such as minerals fuel, timber and water by cities. After World War I, more efficient mass production techniques were developed, and industrialization became prevalent in the economies of the United States, Canada, Japan and western Europe.

Advanced industrialization leads to many changes in human society, and some of those changes negatively affect the supply of natural resources and result in environmental degradation. These changes include: increased production and consumption of goods by humans, dependence on non-renewable resources such as oil and coal, production of synthetic materials (which may be toxic or non-biodegradable) and consumption of large amounts of energy at home and work.

Other changes may have positive benefits. These include: creation and mass production of useful and affordable products, significant increases in the average Gross National Product per person, large increases in agricultural productivity, sharp rises in average life expectancy and a gradual decline in population growth rates.

The information age was born with the invention of miniaturized electronics such as integrated circuits and computer central processing units. This stage in human development has changed and continues to change society as we know it. Information and communication have become the most-valued resources. This shift in turn, may lessen our influence on the earth's environment through reduced natural resource consumption. For instance, in recent years energy use in the United States has not increased to the extent expected from economic growth. Online shopping, telecommuting and other Internet activities may be lessening human energy consumption.

By making good use of information technologies, less developed countries may be able to reduce potential environmental problems as their economies expand in the future. With so much information easily available, developing countries may not repeat the environmental mistakes that more developed countries made as they became industrialized.