12 Humans and the Environment

CHAPTER OVERVIEW

- Human activity can have large global impacts.
- A global perspective is necessary because everything is connected to everything else; we cannot expect to change one aspect of nature without affecting others.
- The term ecosystem combines the concept of a system—a set of interrelated components that form a whole—with that of ecology—the study of relationships between organisms and their environments.
- Human activity has negatively impacted the earth's ecosystems.
- There are many impacts on the ecosystem as a result of humans' use of technology and energy.
- The recognition by political bodies of many of these impacts has led to the concept of sustainable development.

LEARNING OBJECTIVES

After reading this chapter, you should be able to

- describe the relationship between humans and ecosystems, including humans' impacts on ecosystems, climate, and the types of impacts (e.g., increasing pollution or loss of biodiversity);
- identify the relationships between natural resources and human values, including the use of stock resources and renewable resources;
- value and recognize the importance of scale: everything is related to everything else;
- identify the types of energy fuels humans use and the differences in their environmental impacts;
- have a general idea of environmental ethics and how these views shape our understanding of the human–environment relationship; and
- describe some of the interventions designed by governments or desired by scientists to manage human impacts to ecosystems, and their success to date.

KEY TERMS

Adaptation The process by which humans adjust individual and collective behaviour in the face of a particular set of circumstances; sometimes used in relation to environmental change, but applies equally to cultural change. (p. 447)

Anthropocene A recently coined term used to characterize the current period of earth history, viewed as the period during which human activity has been the dominant influence on the physical environment, including climate; preceded by the Holocene. (p. 446)

Anthropocentric A world view which regards humans as the most important part of any ecosystem; the opposing view to the ecocentric perspective. (p. 456)

Catastrophists Those of the view that population increases and continuing environmental deterioration are leading to a nightmarish future of environmental catastrophe, including flooding, mass extinction, food shortages, disease, and conflict. (p. 476)

Conservation Any form of environmental protection, including preservation. (p. 477)

Cornucopians Those who argue that advances in science and technology, along with cultural adaptation, will continue to create resources sufficient to support the growing world population and mitigate environmental change. (p. 476)

Desertification The process by which an area of land becomes a desert; typically involves the impoverishment of an ecosystem because of climate change, human impact, or both. (p. 461)

Ecocentric A world view which emphasizes the equal value of all parts of an ecosystem rather than, for example, placing humans at the centre, as in an anthropocentric perspective. (p. 456)

Ecology The study of relationships between organisms (including insects, plants, mammals, and humans) and their environments. (p. 447)

Ecosphere The ecosystem of the entire planet; sometimes used interchangeably with *biosphere*. (p. 447)

Ecosystem An ecological system; comprises a set of interacting and interdependent organisms and their physical, chemical, and biological environment; exists at a variety of spatial scales from the very local to the global. (p. 447)

Holocene The post-glacial period of earth history that began approximately 12,000 years ago and was preceded by the Pleistocene. (p. 446)

Pollution The release of substances that degrade air, land, or water into the environment. (p. 451)

Renewable resources Resources that regenerate naturally to provide a new supply within a human lifespan. (p. 450)

Stock resources Minerals and land that take a long time to form and hence, from a human perspective, are fixed in supply. (p. 450)

Sustainability An approach that reflects the interdependence of the economy, the environment, and social well-being, and the need to maintain all three components across generations. (p. 477)

Sustainable development Economic development that sustains the natural environment for future generations. (p. 477)

System A set of interrelated components or objects linked together to form a unified whole. (p. 447)

RESEARCH QUESTIONS

1. Describe some of the ways in which humans are trying to stop global climate change.

2. Using examples, explain what sustainable development is and how it can help reduce the impacts of climate change.

3. Do scientists agree about whether humans have passed the point of no return concerning environmental degradation? Consider climate change, water use, and biodiversity loss.

4. How has human activity affected the global water cycle? Using specific case studies, discuss how our impacts on water quality and quantity have been felt in different regions of the world.

5. What is systems thinking and what is its importance to environmental knowledge?

LINKS OF INTEREST

- Greenpeace
  http://www.greenpeace.org

- International Union for Conservation of Nature
  http://www.iucn.org/

- International Panel on Climate Change
  http://www.ipcc.ch/

- Club of Rome
  http://www.clubofrome.org/eng/home/

- United Nations Environment Programme
  http://www.unep.org/

- Waterlution
  http://www.waterlution.org/

SUGGESTED READINGS

Carson, R. 1962. *Silent Spring*. Boston: Houghton Mifflin.

One of the most influential books of the twentieth century, and that launched the modern environmental movement. The book exposed the dangers of pesticide use and how they are harmful to the environment and humans.

Diamond, J. 2005. *Collapse: How Societies Choose to Fail or Succeed*. New York: Viking.

A historical exploration of the environmental, political and population factors that contributed to the demise of past societies and outlines strategies to avoid making the same mistakes.

Gore, A. 2006. *An Inconvenient Truth: The Planetary Emergency of Global Warming and What We Can Do About It*. Emmaus: Rodale.

This book explains that there is no question that global warming is real. Using scientific research, photographs, charts and personal observations, Gore documents growing impacts of global warming.

Goudie, A. 2006. *The Human Impact on the Natural Environment*, 6th edn. Oxford: Blackwell.

An excellent general textbook that discusses the multitude of impacts that humans have had on the environment throughout time.

YOUTUBE VIDEOS

National Geographic. 2015. "Climate Change 101 with Bill Nye." YouTube video, 4:09. Posted December 2015. https://www.youtube.com/watch?v=EtW2rrLHs08

1. How has the earth's climate changed historically?
   - There has been continual change in the earth climate. The majority of which is caused by orbital variation. However, we're witnessing an abrupt increase in the earth's temperature. Ten out of the last 13 years were the warmest on record. The majority of scientists agree that this increase is not caused by orbital variation but by human impacts.
2. How has our increased consumption of GHG's increased the earth's temperature?
   - We have released a large number of non-natural greenhouse gasses because of our desire and use of fossil fuels. GHG traps heat from the sun and causes the increase in temperature.

CrashCourse. 2013. "5 Human Impacts on the Environment: Crash Course Ecology #10." YouTube video, 10:37. Posted January 2013. https://www.youtube.com/watch?v=5eTCZ9L834s

1. What do the earth's support services provide?
   - They create and replenish the earth biological systems. These include recycling the compounds we need for life including the Carbon cycle, hydrologic cycle, nitrogen cycle, and phosphorus cycles. They also help form new soils and oxygen.
2. What are provisioning services?
   - Gives us the materials we need to live. For example, the oceans provide food, while the rivers and lakes provide water, plants and animals provide fibre, and all around us are forms of fuel.