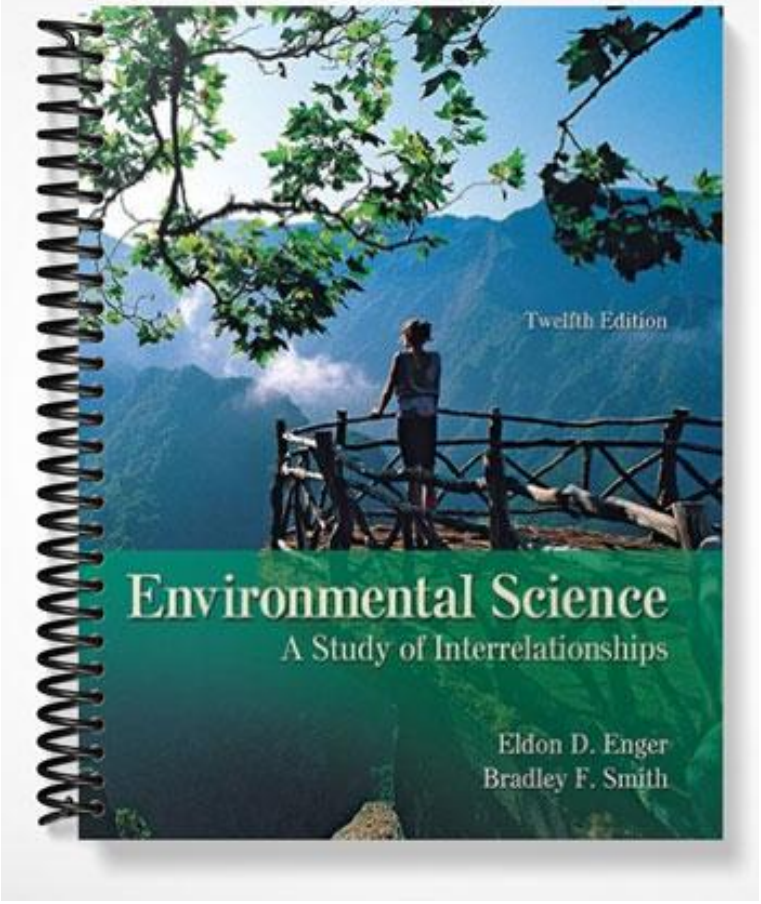
SOLUTIONS MANUAL



CHAPTER 1
ENVIRONMENTAL INTERRELATIONSHIPS

CHAPTER OVERVIEW

Environmental science is an interdisciplinary field which includes traditional science, societal values, and political awareness. The author gives a brief history of the field from ancient cultures to current college course offerings. Mexico-Texas air pollution and the many international environmental summits are provided as examples of the field's interrelated nature. An ecosystem is defined as the region in which organisms interact with their environment. The ecosystem approach is illustrated by examining six resource-based regions of North America: the wilderness North, industrial Northeast, agricultural Middle, diverse South, dry West, and forested West.

Environmental Case Studies include management of Keoladeo National Park and the impact of reintroduced wolves on Yellowstone's ecosystem.

THE CONCEPTS

Environmental issues are interrelated because the natural world is organized into non-political relational units between organisms and their environment called ecosystems.

Managing environmental issues requires a regional, rather than political, approach because each region of the world has a unique combination of culture, resources, and economy.

Solving environmental problems involves compromise between groups who have different views on how a resource should be managed.

Solutions often incorporate economic decisions because most resources provide an income to one of the groups in the debate.

KEY TERMS

ecosystem	environmental science	
environment	science	wilderness

ANSWERS TO REVIEW QUESTIONS

1. Finding solutions is difficult because different groups have different political and economic views on what constitutes an environmental problem. Finding solutions has not always been complicated because in the past the economy was less complicated and few people understood the long-term environmental consequences of their actions.

2. The natural world is organized into relational units between organisms and their environment called ecosystems. An ecosystem approach requires consideration of these relational units. It is the right approach because it looks at the natural world in its natural state—without cultural or political bias.

3. The wilderness North: the protection of rights and beliefs of native peoples and the role of government in managing wilderness. The agricultural Middle: erosion of exposed soil and the threat of pesticides and fertilizers entering the groundwater. The dry West: salt build-up in soil from dry-land irrigation and increased conflict between management of land for livestock and the desire to preserve what remains of the "wilderness." The forested West: land-use debate over government-owned land and destruction of the old-growth forest ecosystem. The Great Lakes and industrial Northeast: solid waste disposal issues and contamination of waterways. The diverse South: development of housing on fragile coastal sites and pollution of the Mississippi River.

4. The environment is the surrounding conditions that affect people and organisms. More broadly, it means everything that affects an organism during its lifetime. For example, the environment of the grizzly bear includes the physical conditions, such as climate and habitat, as well as political and social decisions that affect its life. An ecosystem is a region in which organisms and their physical environment form an interacting unit. An example is the old-growth forest of the forested West.

5. Environmental conflicts arise when groups disagree on what constitutes an environmental problem. Some people may feel justified in their use of a natural resource while others may feel there is a diminished environment. Compromise between the groups is necessary. Government should assist in assuring that all points of view are recognized and that a fair decision is made. Economic and regional issues and long-term impact should be taken into consideration when reaching the final compromise.

6. Answers will vary.

SUGGESTED ACTIVITIES AND RESOURCES

Students often do not bring their textbook to class, so an oversized map of North America would be helpful to discuss the six major regions discussed in the chapter. A climate or biome map might also be helpful to illustrate the relationship between environmental issues and the ecosystems and climate of each region.

In order to help students relate directly to the concept of regional environmental issues, obtain newspaper articles covering local environmental issues for class discussion. This is an activity which could be assigned to the students and continued throughout the semester in the form of an environmental notebook. It will assist students in becoming more aware of the issues in their local community.

Have student's visit Environmental Radio at http://www.enn.com/ and write a report on a news story they heard.

FURTHER READING AND VIEWING

"Exploring Antarctic Ice." Jane Ellen Stevens. *National Geographic*. May, 1996.

Visit *The Green Guide* for more information on sustainable living and products (http://www.thegreenguide.com/).

CHAPTER 2
ENVIRONMENTAL ETHICS

CHAPTER OVERVIEW

This chapter focuses on the various views and attitudes toward nature and how these views are transformed into individual, corporate, and global ethics. Issues such as international transportation of radioactive materials and the greenhouse effect illustrate the need for global management of the planet's resources.

Environmental ethics are divided into three theories: anthropocentric, which is derived from human interests; biocentric, which assumes the rights of every organism; and ecocentric, which considers the environment as a whole. In addition, three ethical views are presented: the development ethic, which is based on the human benefit derived from natural resources; the preservation ethic, which is based on the inherent worth and aesthetic value of nature; and the conservation ethic, which works toward a balance between resource use and preservation.

Corporate and industrial ethics and actions are reviewed with emphasis on their desire for economic growth and resource exploitation, and the pollution which results from industrial energy use and production of waste. As a result of public pressure, many corporations have adopted the CERES principles to guide them in making decisions regarding proper waste disposal and ethical profitability.

THE CONCEPTS

Some people believe that undeveloped resources should be used for the welfare of mankind and to not exploit the resource is wasteful; others believe that natural resources have an inherent value which should not be destroyed.

There are three basic views of environmental ethics: development, preservation, and conservation.

There are three philosophical theories of applied ethics: anthropocentrism, biocentrism, and ecocentrism.

The prevailing societal attitude of developed nations has been one of economic growth and resource exploitation.

Industry is responsible for pollution because it consumes energy and resources, and produces waste.

Environmental justice refers to the impartiality that should guide human health and environmental decisions.

National Capitalism refers to the idea that businesses can sustain a profit while still protecting the environment.

The U.S. consumes large amounts of the world's resources. Each person can change their consumer behavior to reduce their ecological footprint.

KEY TERMS

anthropocentric	ecocentrism	natural capitalism
biocentrism	ecological footprint	preservationist
conservationist	environmental justice	profitability
corporation	ethics	resource exploitation
cultural relativism	externalize the costs	sustainable development
development	industrial ecology	water ethics

ANSWERS TO REVIEW QUESTIONS

1. Ethical approaches to the environment have historically been anthropocentric. Ethics that consider only human interests do not have a good track record for protecting the environment. A new environmental ethic can help create a deeper appreciation of the need to care for the natural environment.

2. The laws of a democratic country should map the ethical commitments of its citizenry. An alternative way to look at the relationship is to think of the laws coinciding with a vision of what makes for a good society. Not every action that is ethically correct can have a law supporting it. Some actions will inevitably have to rely upon the ethics of individuals.

3. Anthropocentric ethics view all moral value in the world as derived from humans and their interests. Biocentric ethics recognize the presence of moral value in all living creatures. Ecocentric ethics find moral value in systemic wholes made up of both biotic and non-biotic parts.

4. A pro-development attitude tends to adopt an anthropocentric approach to nature. It sanctions any manipulation of nature that furthers human goals and interests. Preservationism seeks to keep natural areas ecologically intact and as free from human interference as possible. A conservationist approach seeks a balance between preservation and development. This third approach looks for arrangements in which a broad range of long-term human interests can be sustainability met.

5. The environmental justice movement recognizes that civil rights issues can connect directly to environmental issues. Environmental destruction affects people. Environmental justice has been a valuable corrective to the idea that environmentalism is about saving wilderness areas for the recreational benefit of elite groups.

6. Manufacturing goods for use and consumption by humans is often likely to incur some environmental cost. Corporations are set up with an obligation to manufacture goods as

profitably as possible. These profit margins can sometimes be directly impacted by the expense of pollution controls.

7. Since corporations do not themselves have obligations to the environment, it must be their executives, their shareholders, or their workers who move corporate behavior in a more environmentally sustainable direction. On many occasions, corporations can also be persuaded that it is in their economic interest to treat the environment kindly. Individual consumers can also influence corporate behavior with their purchasing power.

8. Informed individuals can educate themselves about the environmental cost of their consumer choices. Individuals can often make a big difference in their environmental footprint by making a few responsible choices about how and how much they consume. Environmentalists argue that better consumer choices also increase one's quality of life, bringing a payoff both for the environment and for the individual. Citizens living in democracies can also implement their environmental ethics with their voting power.

9. Since we all live on one planet, the choices of people in one part of the world can end up affecting the lives of those who live on the other side of the world. Since it is hard to directly feel a moral obligation to those you will never know or see, global environmental ethics requires international cooperation on a number of environmental issues. National self interest might sometime have to give way to global environmental interest. In the long run, what is good for the global environment will also be good for every nation that calls this planet home.

SUGGESTED ACTIVITIES AND RESOURCES

Assign further writings of the naturalist-authors (or even their biography) to give students a more comprehensive view of the philosopher's background and beliefs. *Sand County Almanac*, by Aldo Leopold, and *Silent Spring*, by Rachel Carson, are both easy to read, inexpensive in paperback form, and available in bookstores.

Another suggestion is to compare the views of these earlier authors with those of modern writers. Assign excerpts from modern works and discuss with students the current naturalist philosophy.

The authors provide a thorough review of GM's environmental principles. Have students contact local companies to obtain annual reports on their environmental policies. Find out if these companies participate in any local stewardship programs or if they have their own local environmental programs.

Have students visit www.myfootprint.org and take the ecological footprint quiz. The quiz calculates how many Earths it would take if everyone lived like YOU. Ask for reactions. In what areas can they really improve their footprint?

FURTHER READING AND VIEWING

"A Typology of Corporate Environmental Policies," by Michel Dion. *Environmental Ethics*. Summer, 1998.

"Indigenous Rights and Environmental Justice," by Ray Perrett. *Environmental Ethics*. Winter, 1998.

"Environmental Ethics in an Urbanized World," by Alastair Gunn. *Environmental Ethics*. Winter, 1998.

Got to Zero Emissions Research & Initiatives (ZERI) at http://www.zeri.org/index.htm or Conservation Economy at http://www.conservationeconomy.net/ to read about cutting edge sustainability projects and sustainable land use plans.

Video – "Strange Days on Planet Earth" by National Geographic (2008)

Video – "The Human Footprint" by National Geographic (2008)

Video – "Bill Moyers' Journal: 9/21/2007: Rachel Carson's Legacy" (2007)

Seventh Annual Message to Congress Dec. 3, 1907 by Theodore Roosevelt – access conservation statement at http://www.pbs.org/weta/thewest/resources/archives/eight/trconserv.htm.