# CHAPTER 1 The Role of Economics in Environmental Management

**TRUE-FALSE**

1. In the Circular Flow Model, money flows are disregarded.

Answer: F

2. Within the Circular Flow Model, households are assumed to be the owners of all factors of production, including the natural resources.

Answer: T

3. Residuals are by-products, or pollution, left in the environment after a technological or natural process as occurred.

Answer: T

4. The discipline concerned with the resource flow from economic activity back to nature is known as natural resource economics.

Answer: F

5. According to the first law of thermodynamics, matter and energy can be destroyed but not created.

Answer: F

6. Nature’s capacity to convert matter and energy is limitless.

Answer: F

7. According to BMW Group, plastics are among the simplest materials to recycle.

Answer: F

8. Natural pollutants are those linked to human activity.

Answer: F

9. Chemical wastes associated with the manufacturer of solvents are anthropogenic pollutants.

Answer: T

10. An airplane is a point source of pollution.

Answer: T

11. Runoff from urban streets is an example of nonpoint source pollution.

Answer: T

12. Since acidic deposition arises around the world, it is considered to be global pollution.

Answer: F

13. The warmer temperatures in the Gulf of Mexico may have increased the magnitude and extent of the damages linked to the Gulf oil spill in 2010.

Answer: F

14. When scientists first identified the ‘ozone hole’ over the Antarctic region in the 1980s, it was less than 10 miles in diameter.

Answer: F

15. Concern for managing natural resources to ensure their quality and abundance for future generations is called sustainable development.

Answer: T

16. Proponents of an environmentally adjusted measure of national income believe that environmental pollution linked to production should be recorded as a loss in the system of national accounts (SNA).

Answer: T

17. Improvements made to China’s environment in preparation for the Olympic Games in 2008 have been maintained and even enhanced over time.

Answer: F

18. The economic criteria concerned with minimizing resource use to achieve an objective is known as allocative efficiency.

Answer: F

19. Setting an air quality standard is an example of a command and control approach to improving the environment.

Answer: T

20. A tax imposed on emissions is an example of the market approach to pollution control.

Answer: T

**MULTIPLE CHOICE**

1. The materials balance model

a. captures only environmental pollution

b. explicitly illustrates both the flow of resources and the flow of residuals

c. illustrates both the money and real flows

d. all of the above

e. (b) and (c) only

Answer: e.

2. According to the materials balance model

a. recycling permanently eliminates residuals

b. only production can damage the environment

c. residuals arise from both consumption and production

d. only households undertake recycling and reuse

Answer: c.

3. Environmental economics

a. is concerned mainly with the residual flow from economic activity back to nature

b. focuses on the flow of resources from nature to economic activity

c. recognizes that the flow of residuals back to nature is preventable

d. none of the above

Answer: a.

4. Recycling efforts such as those exemplified by BMW's Design for Disassembly (DFD) program

a. permanently diminish the flow of residuals back to nature

b. are not represented in the materials balance model

c. represent short-term conversion of residuals into recycled materials or goods

d. reduce the amount of wastes returned to nature in the long-run

Answer: c.

5. According to the second law of thermodynamics

a. matter and energy can be neither created nor destroyed

b. nature’s capacity to convert matter and energy is limited

c. nothing is lost in the conversion of materials from economic activity into other forms of matter and energy

d. all of the above

e. none of the above

Answer: b.

6. Natural pollutants

a. include such releases as hazardous chemical wastes

b. arise from nonartificial processes in nature, such as pollen

c. refer to those associated with human activity such as fossil-fuel combustion

d. all of the above

Answer: b

7. Anthropogenic pollutants

a. are absorbed naturally through the assimilative capacity of nature

b. are human-induced contaminants, such as fossil fuel combustion

c. are of little concern to environmental policy makers

d. come from nonartificial processes in nature, such as salt spray from oceans

Answer: b.

8. Anthropogenic pollutants

a. arise from natural processes in nature, like particles from volcanic eruptions

b. are contaminants linked to human activity

c. are those released only from nonpoint sources

d. are of minimal concern to environmental economists

Answer: b.

9. A polluting source that *cannot* be identified accurately and degrades the environment in a diffuse, indirect way is a

a. stationary source c. nonpoint source

b. point source d. mobile source

Answer: c.

10. Acid rain is an example of

a. local pollution c. regional pollution

b. global pollution d. natural pollution

Answer: c.

11. A school bus is an example of

a. a stationary source c. a nonpoint source

b. a mobile source d. none of the above

Answer: b.

12. All of the following are examples of nonpoint source pollution EXCEPT

a. urban runoff c. agricultural runoff

b. sulfur emissions from power plants d. snowmelt from city streets

Answer: b.

13. An important environmental objective is to preserve the variety of distinct species of animals and plants and the variety of ecosystems they inhabit. This is known as

a. biodiversity c. sustainable development

b. risk assessment d. pollution prevention

Answer: a.

14. Managing the earth’s resources to ensure their quality and abundance for future generations is known as

a. environmental quality c. sustainable development  
b. ecological preservation d. biodiversity

Answer: c.

15. According to proponents of an environmentally-adjusted measure of a nation’s macroeconomic performance

a. GDP fails to properly capture the effects of environmental pollution

b. GDP appropriately accounts for natural resource depletion

c. the international community does not support environmental accounting

d. the guidelines outlined in the SEEA of 2003 are meaningless

Answer: a.

16. The National Environmental Protection Act (NEPA) of 1969

a. calls for Environmental Impact Statements (EIS) on major legislative proposals

b. coordinates environmental tasks among federal agencies

c. guides all environmental policy formulation in the United States

d. all of the above

e. (c) and (d) only

Answer: d.

17. Risk assessment

a. ignores relative risk among environmental goals

b. deals with choosing from among alternative risk responses

c. assures a fair and equitable risk burden among segments of society

d. is concerned with the qualitative and quantitative evaluation of risk

Answer: d.

18 Allocative efficiency

a. is important for economic theory but not relevant to environmental policy

b. calls for the equality of additional benefits and additional costs

c. is automatically achieved when cost-effectiveness is achieved

d. requires that the total costs to society linked to environmental policy are equivalent to the associated total benefits

Answer: b.

19. Charging a polluter a fee for each unit of pollution released is an example of

a. the market approach to environmental policy

b. the polluter-pays principle

c. the command-and-control approach to environmental policy

d. (a) and (b) only

Answer: d.

20. A policy effort aimed at reducing the damage from residual flows is considered

a. a short-term management strategy

b. to be a long-term approach aimed at future environmental deterioration

c. a type of pollution prevention (P2) strategy

d. an attempt to achieve environmental justice

Answer: a.

**SHORT PROBLEMS**

1a. Give a specific example that shows clearly how the System of National Accounts endorsed by the United Nations fails to properly capture activity that harms the environment.

b. Now, suggest a way to quantitatively correct the flaw in the particular case that you describe in part (a).

**Suggested Response***Responses may include any of the examples cited in the Application on environmental accounting, such as the devaluation of any natural resource due to pollution, or the clearing of forests for industrial development, which are excluded from national income measures, or the health care costs linked to toxic exposure that improperly inflate GDP. Depending on the example, the correction may be to estimate the value of the lost resource and deduct it from GDP or to deduct the actual health care cost for toxic exposure from the GDP measure.*

2. Identify and briefly explain two economic incentives that would encourage firms to research and implement “design for recycling” programs.

**Suggested Response***Answers may include subsidies for researching such issues as identifying recyclable materials or devising better methods for sorting plastics, or federal grants for appropriate capital investment in recycling or sorting equipment, or tax deductions for designated expenditures on dismantling, recovery, recycling, or sorting.*

3. Briefly explain why China’s environment has declined so severely, and find an article or two from the popular press that updates the progress in reversing the trend.

**Suggested Response***Correct responses should address China’s rapid economic growth rate, as discussed in the boxed Application, its large size, which adds to total abatement costs, and the fact that China’s clean-up efforts are focused mainly on large urban centers, which leaves rural communities and smaller cities facing serious environmental decline. Media coverage of China’s economic growth and environmental pollution problems has been extensive, so students should find sufficient evidence, at least anecdotally, on current efforts and progress to date.*

**CASE studY**

**Case 1.1: Coalition for Environmentally Responsible Economies (CERES)**

In 1989, the Coalition for Environmentally Responsible Economies (CERES) was formed. Its purpose is to encourage the corporate sector to assume full responsibility for the environmental consequences of its actions. The coalition is composed of environmental and social interest groups, such as Friends of the Earth, Union of Concerned Scientists, and the Natural Resources Defense Council, and investment groups like the Social Investment Forum (SIF), which is a nonprofit association concerned with socially responsible investing, and Winslow Management Company, which is dedicated to green investing. To accomplish its goal, CERES embarked on a plan to draft a pledge document through which private firms would commit to environmental objectives. The membership collaborated to define specific standards to which signatories of the compact would be held accountable. Biodiversity, sustainable development, and pollution prevention were among the issues considered for the final document. Ultimately, the group settled on a set of 10 guidelines, originally called the "*Valdez* Principles," after the infamous March 1989 Alaskan oil spill, and now known simply as the CERES Principles.

The next step was critical. The CERES membership invited thousands of corporations to sign the environmental pledge. Working with institutional investors and firms that collectively control trillions of dollars in assets, one might expect that CERES’ financial clout would be effective in garnering corporate participation. Despite a strong effort, however, the corporate response has been limited. As of 2011, just over 80 companies have formally joined the ranks of CERES companies.

1. Visit the CERES Web site at **www.ceres.org**, and review the CERES Principles. Identify at least one principle with which compliance may be difficult to measure. Discuss briefly.

2. At the CERES Web site, find and review the current list of CERES Network Companies. Identify any three that are Fortune 500 firms. Using economic theory, discuss the incentives that likely prompted these large companies to endorse the CERES principles.

3. Based on your careful assessment of the ten CERES principles and other relevant information at the CERES Web site, discuss possible reasons why the corporate sector response to this effort has not been greater based on the limited number of endorsing firms worldwide. If you were employed by CERES or by one of its members, how might you create incentives to gain a larger number of corporate endorsers?

**Sources:** Coalition for Environmentally Responsible Economies (CERES) (2011a, 2011b); CERES (1989), as reported in the Canadian Institute of Chartered Accountants (1992), Table 2.1, pp. 7-8; Parrish (February 4, 1994); Ohnuma (March/April 1990).