



Chapter 1 Understanding Our Environment

Key Terms

biocentric preservation
ecological footprint
environment
environmental science

extreme poverty
indigenous people
sustainable development
utilitarian conservation

Skills

1. Distinguish between the environment, environmental science, and ecology.
2. Summarize the contributions of various individuals in the environmental history of the United States.
3. Identify the current global environmental problems that humans are facing.
4. Argue whether sustainable development is possible. Evaluate the benefit of economic growth over environmental damage.
5. Examine the plight of indigenous people. Appraise their value in terms of earth's diversity.

Introduction

The environment is an organism's surroundings. Environmental science is not just the study of ecology, the interaction of living things in their environment. Environmental science also addresses the role of human beings and the effects their activities have on the environment.

Brief History of the Environmental Movement in the United States

- George P. Marsh
 - published *Man and Nature* in 1864, which warned of environmental damage occurring in the West
 - partially responsible for establishment of the forest reserves in 1873
- Theodore Roosevelt
 - noted for his interest in conservation
 - established the first wildlife refuge to protect the brown pelican
 - moved the Forest Service into the Department of Agriculture from the Department of the Interior
- Gifford Pinchot
 - first head of the forestry service under Roosevelt
 - used utilitarian conservation—use the forests for the greatest good for the greatest number of people for the longest possible time—still used by the National Forest System (NFS) as the multiple use sustained yield policy
- John Muir
 - founded the Sierra Club
 - believed in biocentric preservation—living things have intrinsic value and therefore ought to be protected simply because they exist
 - assisted in the establishment of Yosemite and Kings Canyon National Parks





- Stephen Mather
 - follower of John Muir
 - first head of the National Park Service established in 1916
- Rachel Carson
 - biologist who published the seminal *Silent Spring* in 1962, which suggested that the levels of DDT were causing the declines of raptors
 - initiated concern into the effects of pollutants on the environment
- Wangari Maathai
 - Organized Green Belt movement in Kenya, which has planted over 30 million trees
 - Received Nobel Peace Prize for her work in 2004

Take Note: The history of the environmental movement is important. Every chapter will have more historical background and pertinent legislation that must be understood to do well on the AP exam in May.

Current environmental concerns

The first and foremost concern is the alarming increase in the human population. All other environmental problems in the world can be attributed to the distribution and density of humans in the natural environment. The current human population is over 6 billion and is expected to climb to 10 billion in the next 50 years. Critical problems for this looming increase in population include the following:

- Food production
 - soil erosion—movement of soil from one area to another
 - salinization of farmland—increasing irrigation results in deposition of salt on the surface of agricultural lands
 - pesticides and fertilizers contaminate ground and surface water
- Decrease in biodiversity of habitats
 - species extinction—the irreversible loss of a species when the last of its members die
 - habitat loss has included: deforestation—removal of forests for agriculture, grazing, and lumber/wood; destruction of wetlands; desertification—degradation of previously viable land by overuse due to agriculture or ranching; overfishing
 - invasive exotic species—non-native species that lack competition or predators in a new environment so that they rapidly proliferate
- Poverty
 - over one-sixth of the earth's human population live in extreme poverty and lack sanitation, drinking water, adequate food, healthcare, education, energy resources and housing





- poor are frequently subject to environmental injustice as they do not have the education nor resources to resist contamination or degradation of their environment
- 20% of the earth's population lives in the 20 wealthiest countries
- wealth gap—the gap between the wealthy and the poor—has been steadily increasing
- Energy
 - depletion of fossil fuel reserves
 - pollution from combustion of fossil fuels
 - environmental damage from recovery/transport of fossil fuels
- Water
 - groundwater/surface water contamination
 - groundwater depletion from pumping for irrigation
 - surface-water shortage
- Pollution
 - global warming—an increase in the earth's temperature due to increased levels of greenhouse gases, which retain infrared radiation, thus heating the atmosphere
 - acid deposition—deposition of low pH precipitation resulting from acidic particles released into the atmosphere
 - ozone depletion—loss of the protective stratospheric ozone due to the release of chlorine containing compounds into the atmosphere
- Global climate change
 - Disappearance of sea ice and melting of permafrost
 - Rising sea levels flood islands and low-lying coastal areas

Take Note: This introductory overview is brief. Far more detail regarding these pressing issues will be addressed in upcoming chapters.

Sustainability

Sustainability means using the earth's resources in a responsible fashion, thus allowing current and future generations access to the resources. Sustainable development means improving one's current standard of living without compromising the standard of living of future generations. Economic growth must be balanced against environmental degradation. The ecological footprint is the measure of the demands people place upon nature. A questionnaire allows you to determine the impact you are making upon the earth. Global environmentalism is examining global environmental issues as a whole, not as separate problems in order to work toward solutions in conjunction with other countries.

Indigenous People

Indigenous people are people native to an area, often subject to environmental injustice and repression. These individuals are frequently oppressed by newcomers and then lose their land, food resources, and culture.





Questions

Match the individual to his contribution to the environmental movement.

- a. John Muir
- b. Gifford Pinchot
- c. Theodore Roosevelt
- d. Stephen Mather
- e. George Marsh

1. ran U.S. Forestry service under concept of utilitarian conservation
2. believed in preservation of natural areas for the benefit of future generations
3. first director of the National Park Service
4. established the first wildlife refuges in the United States

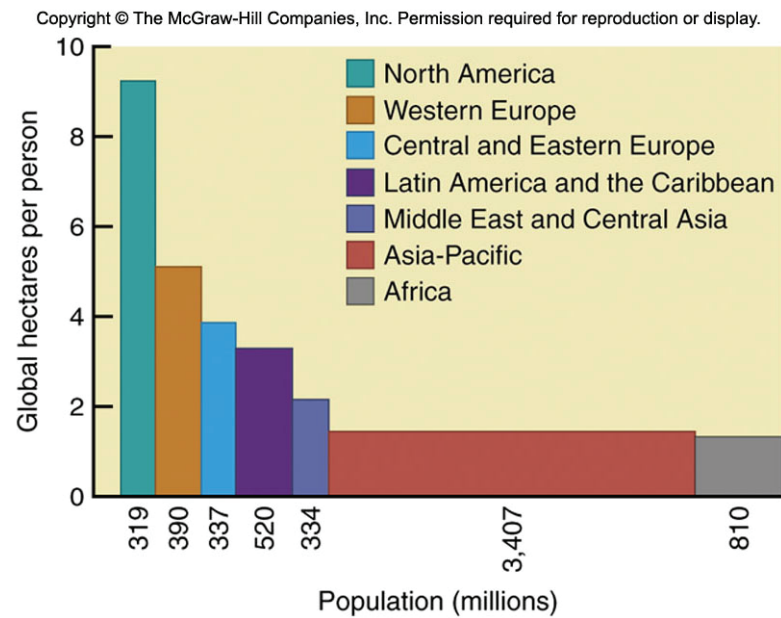
5. The leading cause of species endangerment is
 - a. maintenance of native species in an area.
 - b. fishing limits placed upon fish found in low number in the ocean.
 - c. habitat destruction.
 - d. preventing the harvest of old growth forests.
 - e. preventing environmental contamination with DDT.

6. Fossil fuels provide what proportion of the energy used in industrialized countries?
 - a. 40%
 - b. 50%
 - c. 60%
 - d. 70%
 - e. 80%

7. Utilitarian conservationists believe in protecting resources for their
 - a. value as habitat for wildlife.
 - b. aesthetic value.
 - c. intrinsic value.
 - d. economic value.
 - e. role in the biosphere.

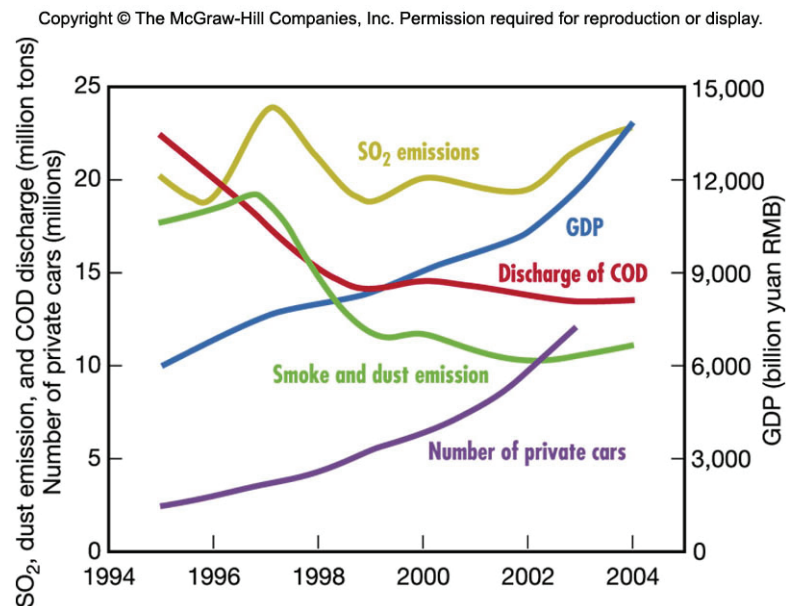
8. The poorest nations are characterized by which quality of life indicator?
 - a. low infant mortality rates
 - b. low income
 - c. low number of children
 - d. adequate nutrition
 - e. high availability of medical care





9. Using the figure above, in comparison to the per capita land use of people in the Asia-Pacific region, the per capita land-use of North Americans is
- exactly the same, because there are fewer people in North America.
 - twice as much.
 - three times as much.
 - over four times as much.
 - six hectares per person.
10. Which statement about world population is not correct?
- The number of children born per woman has decreased significantly in the past 20 year.
 - By 2050, much of the world will have achieved a below-replacement fertility rate of 2.1 children per woman.
 - The world population is predicted to grow to 12 billion by 2050
 - Many developed countries are now experiencing population declines.
 - Life expectancies have nearly doubled in the past 100 years.





11. Which statement about the figure above is correct?
- GDP has remained constant
 - the number of private cars has tripled
 - the greatest decline in SO₂ emissions occurred between 2000 and 2002
 - smoke and dust emission declined significantly between 1997 and 1999
 - there appears to be a direct relationship between the discharge of COD and the GDP

Explanations

- b
- a
- d
- c
- c. Habitat destruction is the leading cause of species endangerment. Maintaining native species in an area should help prevent endangerment. Placing fishing limits on fish found in low number in the ocean will help avoid their endangerment. Preventing the harvest of old growth forests will protect habitat, and preventing environmental contamination with DDT will prevent bioaccumulation in sensitive species.
- e. Fossil fuels provide 80 percent of the energy used in industrialized countries.
- d. Utilitarians, as their name implies look at nature as providing useful things.
- b. Low income is the quality of life indicator characterized by the poorest nations. The quality of life indicators found in the poorest nations include high infant mortality rates, low income, high numbers of children, inadequate nutrition, and low availability of medical care.
- d. The per capita land use in NA is over 9, which is more than 4 times the per capita land use in Asia-Pacific, which is less than 2.
- c. World population is only expected to grow to 8.9 billion



11. d. This is the only statement supported by the graph.

