**Chapter 1**

**Science and the Environment**

**Section 2: The Environment and Society**

**Day 1**

**“The Tragedy of the Commons”**

* In his essay, ecologist \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ argued that the main difficulty in solving environmental problems is the conflict between the short-term interests of the individual and the long-term welfare of society.
* The example he used was the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, or the areas of land that belonged to the whole village.

**“The Tragedy of the Commons”**

* It was in the best interest of the individual to put as many animals in the commons as possible.
* However, if too many animals grazed on the commons, they destroyed the grass.
* Once the grass was destroyed, everyone suffered because no one could raise animals on the commons.

**“The Tragedy of the Commons”**

* The commons were eventually replaced by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Owners were now careful not to put too many animals on their land, because overgrazing wouldn’t allow them to raise as many animals next year.
* Hardin’s point being that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**“The Tragedy of the Commons”**

* Hardin’s point can be applied to our modern commons, natural resources.
* Humans live in societies, and in societies, we can solve environmental problems by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* The solution may be to override the short-term interests of the individual and improve the environment for everyone in the end.

**Supply and Demand**

* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** is a law of economics that states as the demand for a good or service increases, the value or the food or service also increases.
* An example is the world \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Costs and Benefits**

* The cost of environmental solutions can be high.
* A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ balances the cost of the action against the benefits one expects from it.
* The results depend on who is doing the analysis.
* For example, pollution control may be too costly to an industry, but to a nearby community, the price may well be worth it.
* Often, environmental regulations are passed on to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Risk Assessment**

* One of the costs of any action is the risk of an undesirable outcome.
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a tool that helps us create cost effective ways to protect our health and environment.
* To come up with an effective solution to an environmental problem, the public must perceive the risk accurately.

**Developed and Developing Countries**

* The unequal distribution of wealth and resources around the world influence the environmental problems and solutions a society can make.
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ have higher incomes, slower population growth, diverse industrial economies, and stronger social support.
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ have lower average incomes, simple agriculture-based communities, and rapid population growth.

**Population and Consumption**

* Almost all environmental problems can be traced back to two root causes:
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Local Population Pressures**

* When the population in an area grows rapidly, there may not be enough natural resources for everyone to live a healthy, productive life.
* In severely overpopulated regions, forests are stripped bare, topsoil is exhausted, and animals are driven to extinction.
* In these areas, malnutrition, starvation, and disease can be constant threats.

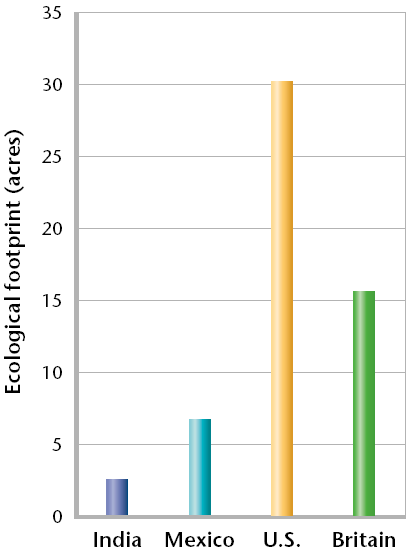
**Local Population Pressures**

* In \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, millions of people are starving.
* Yet these human populations tend to grow the fastest.
* Food production, education, and job creation cannot keep pace with the population growth, so each person gets fewer resources as time goes by.

**Consumption Trends**

* To support the higher quality of life, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are using much more of Earth’s resources.
* Developed nations use about \_\_\_\_\_\_\_\_\_\_\_\_\_ percent of the world’s resources, although they make up only \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ percent of the world’s population.
* This rate of consumption creates more waste and pollution per person then in developing countries.

**Ecological Footprints**

* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** are calculations that show the productive area of Earth needed to support one person in a particular country.
* An ecological footprint estimates the land used for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* It also includes the ocean area used to harvest seafood and the forest area needed to absorb the air pollution caused by fossil fuels.

**Ecological Footprints**

* An ecological footprint is one way to express the

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Critical Thinking and the Environment**

* People on either side on an environmental issue may feel passionately about their cause and can distort information to mislead people about the issue.
* Research done by scientists is often used to make a political point or is misinterpreted to support controversial data.

**Critical Thinking and the Environment**

* In addition, the economic dimension of an environmental issue may be oversimplified and to complicate matters still, the media often sensationalizes environmental issues.
* For these reasons and others, you must use your critical thinking skills when making decisions about environmental issues.

**Critical Thinking and the Environment**

* Remember a few things as you explore environmental science further:
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**A Sustainable World**

* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** is the condition in which human needs are met in such a way that a human population can survive indefinitely.
* Sustainability is a key goal of environmental science.

**A Sustainable World**

* A sustainable world is not unchanging as technological advances and human civilizations continue to be productive.
* However, our current world is not sustainable as the developed countries are using resources faster than they can be replaced.
* Achieving a sustainable world requires everyone’s participation including individual citizens, industry, and the government.