

6-1 A Changing Landscape

Earth as an Island

All organisms on Earth share a limited resource base and depend on it for their long-term survival. To protect these resources, we need to understand how humans interact with the biosphere.

What types of human activities can affect the biosphere?

Human Activities

From the ecosystems in which they live, humans obtain such necessities as clean water and recycled nutrients. Ecologists refer to such necessities as “ecosystem goods and services” because they have value to individuals and societies.

Some human activities that affect the biosphere include:

- **hunting and gathering**
- **agriculture**
- **industry**
- **urban development**

Hunting and Gathering

For most of history, humans obtained food by hunting and gathering.

Today, groups of people in scattered parts of the world still follow the hunter-gatherer way of life.

Agriculture

Agriculture is the practice of farming. It includes the production of crops and the raising of livestock.

Agriculture provides human societies with a dependable supply of food that can be produced in large quantity and stored for later use.

From Traditional to Modern Agriculture

In the 1800s and 1900s, advances in science and technology set the stage for a remarkable change in agriculture.

- Large-scale irrigation turned deserts into fertile farmlands.
- New machinery helped farmers increase yields.
- New varieties of crops produced higher yields.
- Chemical fertilizers boosted plant growth.
- Pesticides controlled crop-damaging insects.

New crops were often grown using a practice called **monoculture**, in which large fields are planted with a single variety of crop year after year.

The Green Revolution

The green revolution was an effort in the mid-twentieth century to increase global food production through modern plant breeding and agricultural techniques.

Over the last 50 years, the green revolution has helped world food production double.

Challenges for the Future

While increasing world food supplies, modern agriculture has created ecological challenges. For example:

- Monoculture leads to problems with insect pests and diseases.
- Finding enough water for irrigation is difficult.

Industrial Growth and Urban Development

Human society and its impact on the biosphere were transformed by the Industrial Revolution, which added machines and factories to civilization.

The energy to power machinery comes mostly from fossil fuels—coal, oil, and natural gas.

Industrial growth and urban development affect both the local and global environment.

Discarded industrial waste pollutes air, water, and soil.

Dense human communities also produce waste.

Suburban growth consumes farmland and stresses native plants and animals.