



Core units: Exemplar – Year 10

Illustration 2: Environmental change

Environmental change

The nature of environmental change

While fossil evidence suggests that modern humans evolved in East Africa around 200,000 years ago, the development of humans into a cultural species dates back only about 60,000 years, and the first domestication of plant and animals by humans dates back only 12,000 years.

Throughout its relatively short human history, the earth has constantly been under the influence of people who have changed the natural environment to suit their needs and wants. From the earliest clearings for small-scale farming and subsistence agriculture, to more intensive types of agriculture, urbanisation and industrialisation, a wide range of ecosystems have been modified. While some of these modifications have enhanced environmental functions, in many cases the source, sink, service and spiritual functions of the environment have been placed at risk.

Geographers are concerned with the sustainability (or maintenance into the future) of the earth's environmental functions that support human life and welfare. These functions can be grouped into four main types – source, sink, service and spiritual.

Earth's source function

Earth's source function refers to its natural resources which have originated directly from the biophysical environment. Examples include water, soil, timber, fish stocks, minerals and fossil fuels. Earth's natural geomorphic, atmospheric, hydrologic and biologic systems are responsible for both their existence and their uneven distribution across the planet. Depending on the degree to which they can be sustained with continued human use, these natural resources are often classified as being either renewable (able to be replenished by nature in a relatively short amount of time) or non-renewable (unable to be replenished in a human lifetime, only on geologic time scales which range from hundreds to millions of years).

Some geographers also refer to a third category of natural resources known as perpetual or continuous resources. These resources, such as solar radiation, tides and winds, are in no danger of being used in excess of their long-term availability, and in recent years there has been a steady movement towards the development of ways to better utilise these resources.

Earth's sink function

The safe absorption of the wastes and pollution produced by human activities and life is referred to as earth's sink function. It is the way in which the environment deals with what people put into it. Humans depend on the environment to break down, recycle or safely store their waste, including rubbish, gaseous emissions from use of vehicles, effluent, industrial wastes and fertiliser run-off.

Earth's service function

A third environmental function is earth's service function. It refers to the provision of environmental or ecosystem services that support life without requiring human action. For example, the earth's natural greenhouse effect operates to ensure that the atmosphere holds the heat produced by incoming solar radiation during the day so we are able to keep warm at night (climate regulation). The way in which earth's ozone layer helps to screen out ultraviolet radiation is also illustrative of the earth's service function. Other examples of earth's natural processes and cycles include the heat budget, water cycle, carbon cycle, photosynthesis, pollination, seed dispersal, carbon sequestration and soil formation.

Earth's spiritual function

Earth's intrinsic recreational, psychological, aesthetic and spiritual value of environments is referred to as its spiritual function. The extent of this function will vary depending on the culture, beliefs and values of the people who use the land and sea. For example, the Aboriginal and Torres Strait Islander people have very strong spiritual links to the land based on their beliefs of the Dreamtime. Hindus in India believe the Ganges River to be of spiritual significance.

However, spiritual does not only refer to a religious context. It is also about emotions, psychological attachment and aesthetic feelings about places. If you have ever marvelled at the sight of a rainbow, been moved by a sunset or the view from a headland, you have experienced the spiritual function of the environment. Dorothea Mackellar's well-known poem 'My country' provides an excellent illustration of earth's spiritual function.

Activities

1. Create a glossary of environmental terms and definitions, and include:
 - source function
 - sink function
 - service function
 - spiritual function.
2. Consider the list of sustainability principles below.
 - Discuss with members of the class which of the four environmental functions each refers to.
 - Consult the 'Principles of sustainability' found on page 27 of the *Shape of the Australian Curriculum*, which can be found at this location:
http://www.acara.edu.au/verve/_resources/Shape_of_the_Australian_Curriculum_Geography.pdf
 - Propose any additional principles of sustainability that you feel should be added to the list in order to protect the source, sink, service and spiritual functions of the environment.
3. Describe the difference between renewable, non-renewable and continuous resources. Use examples to support your answer.
4. Identify three ways in which humans depend on the environment to breakdown, recycle or safely store the waste they produce.
5. Find out about the following services provided by the environment:
 - acidification of soils
 - accelerated soil erosion
 - beach erosion
 - weed invasion
 - enhanced greenhouse effect.
6. Read the poem 'My country' <<http://www.dorotheamackellar.com.au/archive/mycountry.htm>> written by Dorothea Mackellar. It was written while she was living in England and missing her home country, Australia. How does Mackellar provide an insight into the spiritual function of the earth?
7. Think of a time when you have experienced feelings of wonder and awe or have felt moved or connected to a particular landscape. Describe that moment in the form of a story, poem or drawing. Share your experience with members of the class.