Chapter - 1

INTRODUCTION TO ENVIRONMENTAL STUDIES

Definitions

The term *environment* is derived from a French word *environner* which means ‘surrounding’. It refers to an aggregate of all conditions that affect the existence, growth, and welfare of an organism or a group of organisms. The term may be defined in a number of ways:

Environment

Environment is sum of all social, economical, biological, physical, or chemical factors which constitute the surrounding of men/living organism.

Types of Environment

Natural Environment

It includes components such as air, water, soil, land, forest, wildlife, flora, fauna, etc.

The natural environment on Earth is divided into the following four realms:

- Lithosphere
- Hydrosphere
- Atmosphere
- Biosphere

Anthropogenic Environment

It includes components that have been introduced by human beings depending on their needs and requirements.

Components of Environment

- Abiotic components

  Non living components of an ecosystem include all the physical and chemical factors that influence living organism Examples are air, water, soil, rocks, etc.

- Biotic components

  Living component of environment such as microbes, plants, animals and human beings.

Biotic component

- Auto tropes or producers

  Includes green plants and algae which manufacture their own food

  chemo auto tropes ⟶ chemosynthesis

  photo auto tropes ⟶ photosynthesis

- Hetero tropes or consumers

  The organism of this group are not capable of manufacturing food and depends on auto tropes to meet their food requirement.

- Physical environment

  Includes light, temperature humidity, rain, soil etc.

- Chemical environment

  Includes gases acids, water, inorganic elements and organic substances etc.

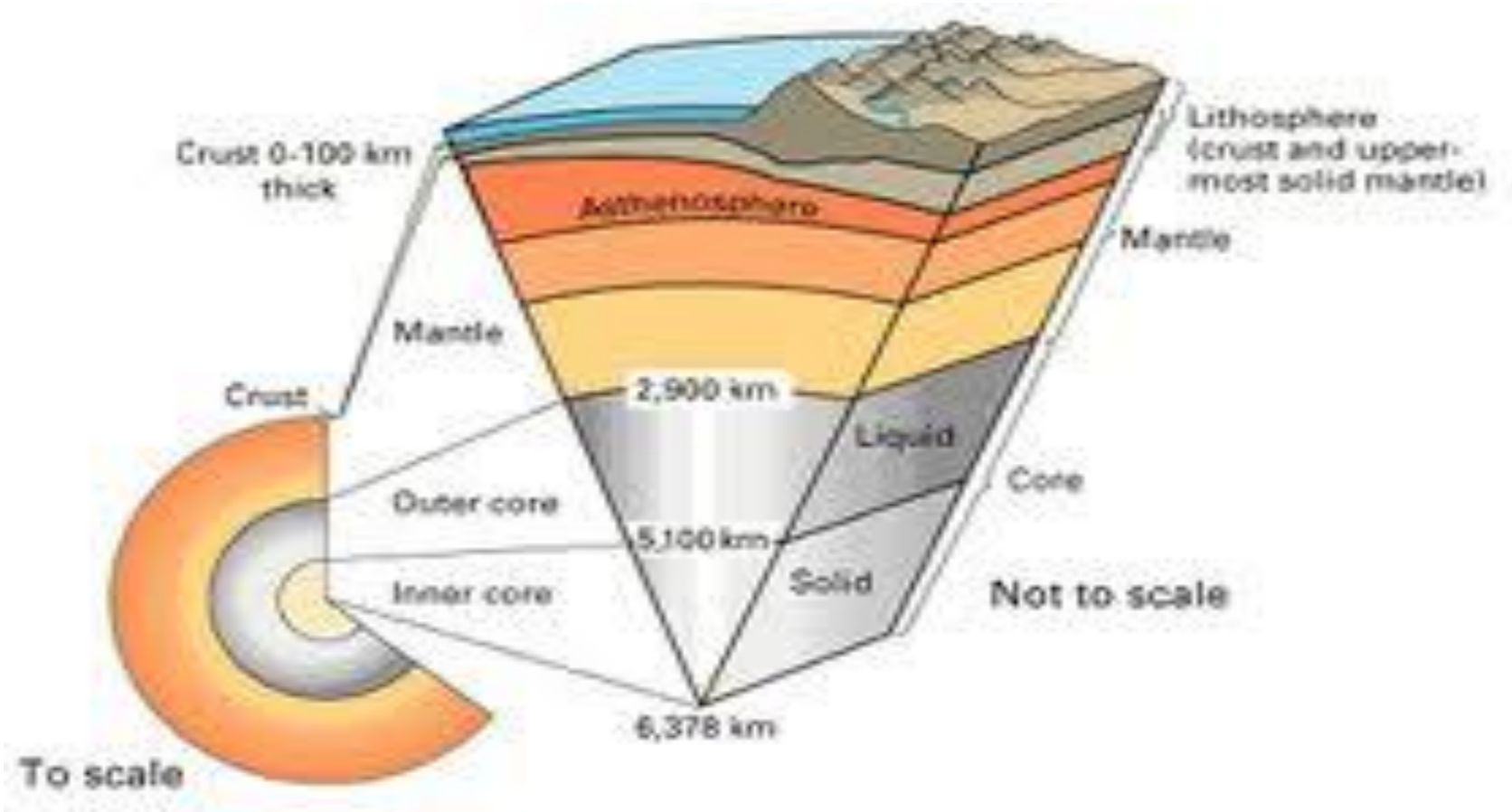
- Biological environment

  Includes all life on earth (can be bacteria, viruses, microbes, algae, herbs, shrubs, mammals etc.)

Segments of Environment

- Lithosphere
- Hydrosphere
- Atmosphere
- Biosphere

Lithosphere



Lithosphere

- The earth's crust consisting of the soil and rocks is the lithosphere. The soil is made up of inorganic and organic matter and water.
- The main mineral constituents are compounds or mixtures derived from the elements of Si, Ca, K, Al, Fe, Mn, Ti, O etc. (Oxides, Silicates, and Carbonates).
- The organic constituents are mainly polysaccharides, organic compounds of N, P and S. The organic constituents even though form only around 4% – 6% of the lithosphere, they are responsible for the fertility of the soil and hence its productivity.

Earth's Crust

- Igneous Rock (granite, diorite etc.)
- Sedimentary Rock (lime stone, sand stone etc.)
- Metamorphic Rock (marble, slate etc.)
- Soil

Hydrosphere

- **Water on the earth in all forms: solid (ice), liquid (water) and gas (water vapour)**
- The presence of water on the earth gives it name ‘blue planet’.

Hydrosphere

Atmosphere


320km (195.6mi)
Thermosphere
80km (49.7mi)
Mesosphere
50km (21.1mi)
Stratosphere
12km (7.5mi)
Troposphere

Biosphere

Environmental Studies

- Environmental Studies refers to the study of the environment.
- It is not restricted to the point of view of one particular discipline but involves all disciplines that may affect the environment in any possible way.
- It involves the study and understanding of the fact that even a single phenomenon can affect the environment in a variety of ways with varying degrees of complexity, and each of these effects can be understood from different perspectives rooted in different disciplines.

Programs Under Environment Studies

- Environmental studies

  Systematically studies the interaction of human beings with the environment. It includes natural environment, built environment, and sets of relationship between them.

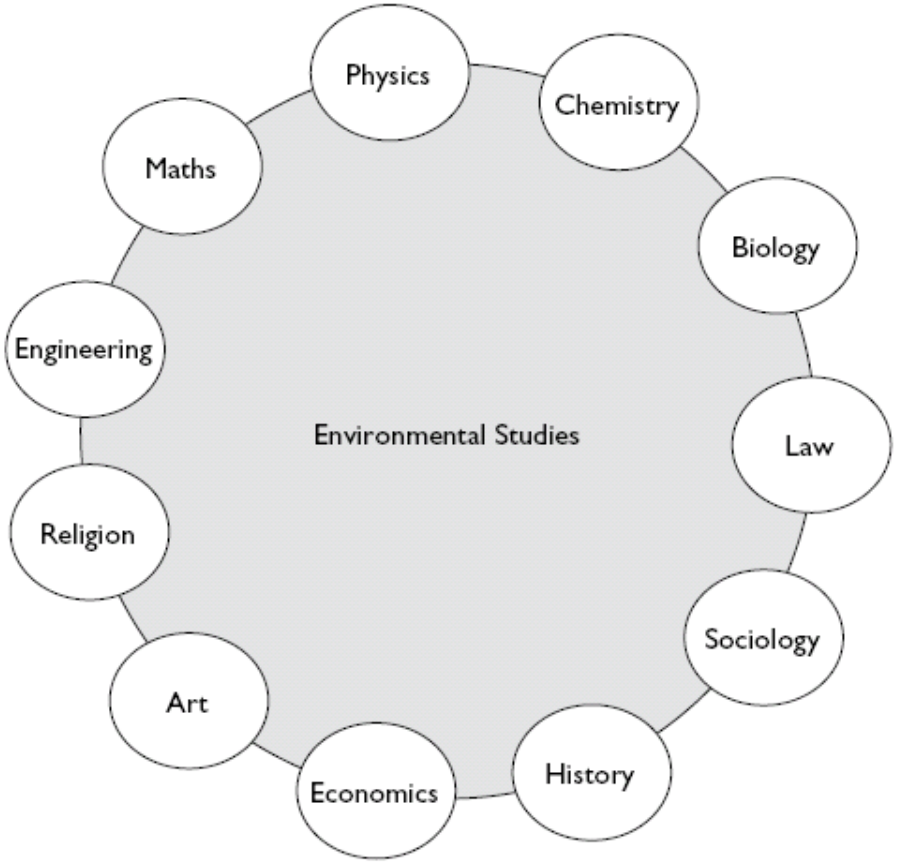
- Environmental sciences

  Integrates physical and biological sciences (including physics, chemistry, biology soil sciences, geology, and geography)

- Environmental engineering

  Application of science and engineering principle to improve the quality of environment.

Multidisciplinary Nature of Environmental Studies



Environmental Studies requires skills that encompass a range of disciplines including chemistry, biology, earth sciences, atmospheric science, statistics, mathematics, and geography.

Scope of Environmental Studies

Due to its complex and multi- disciplinary nature environmental studies as a subject has a wide scope-

- Natural Resources- their conservation and management
- Ecology and biodiversity
- Ecosystem structure and function
- Environmental pollution and control
- Social Issues in relation to development and environment
- Human population and environment
- Environment management

Scope of in Environmental Studies (Career Option)

- Research and development (R & D)
- Green advocacy
- Green marketing
- Green media
- Environment consultancy
- Forest management
- Environmental journalism
- Environmentalists

Importance of Environmental Studies

- Environmental Studies is useful in checking environmental pollution.
- It helps in maintaining ecological balance.
- It helps to gain skills to assess the environmental impact of human activities.
- It gives us basic knowledge of environment and associated problems.
- It helps to achieve sustainable development.
- It helps to educate people regarding their duties towards the protection of environment.

Objectives

The following are the main objectives of creating environmental public awareness:

- To identify various plants, animals, and other living and non-living components of the environment that are endangered by human activities.
- To take appropriate decisions regarding use of natural resources.
- To conserve nature and natural resources for the betterment of the society from the point of view of social, cultural, and economic development.
- To adopt appropriate measures for solving existing environmental issues.

Need for Public Awareness

1. Rapidly changing technology lead to abandoned waste.
2. Our fast and energy demanding life style pollutes the environment.
3. Crazy consumers leads to environmental degradation.
4. The earth has a definite capacity to tolerate pollutants and sustain population.

Environmental Degradation

- Rapid Population Increase
- Unsustainable Resource Use
- Poverty
- Market Prices of Goods
- Environmental Management with Inadequate Knowledge

The story of Kalahandi: From forests to famine

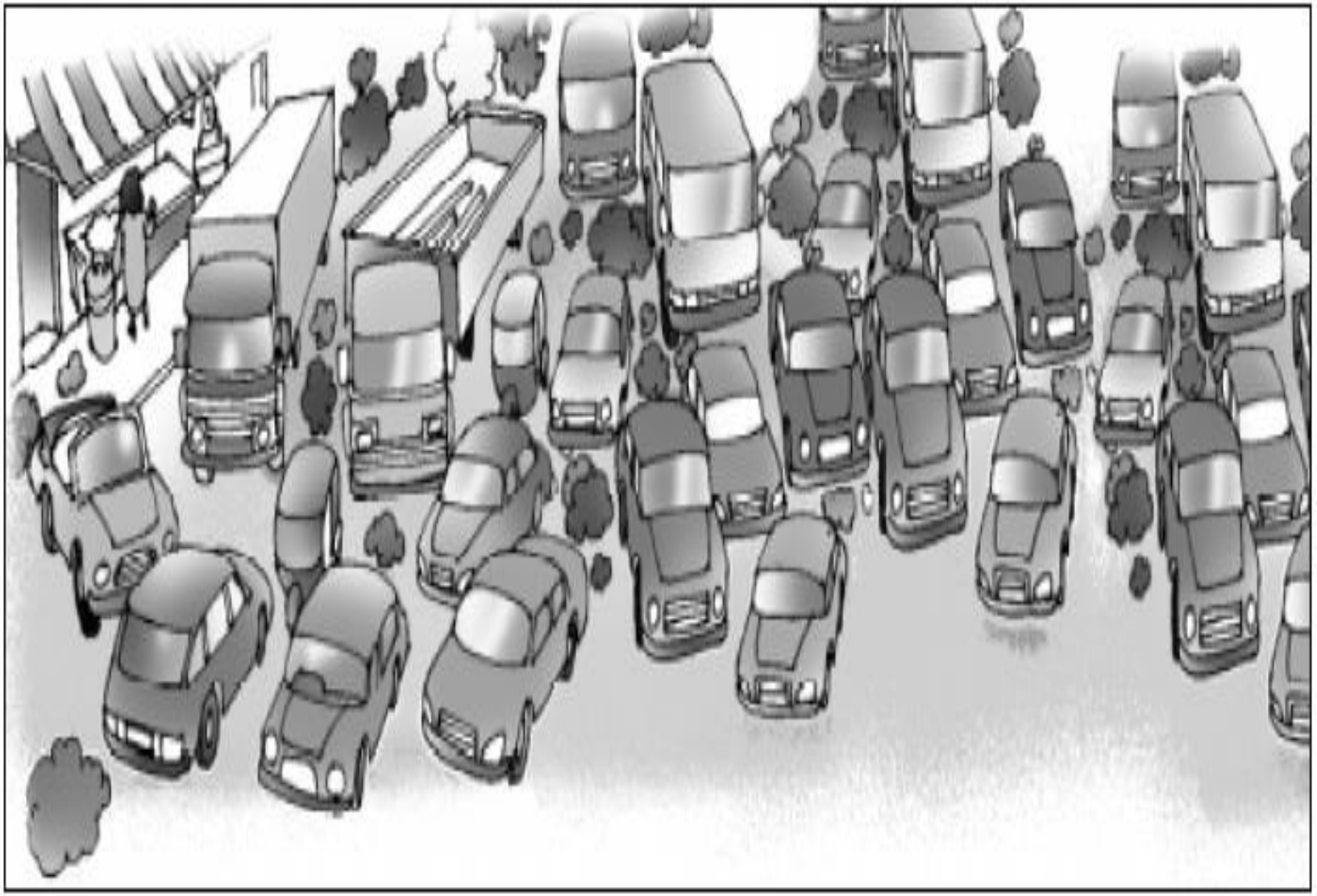
The Story of Kalahandi

- Kalahandi District in Orissa some decades ago:
  - Full of forests
  - 1000s of water sources controlled by community
  - Abundant diversity of crops
- Kalahandi today:
  - Extreme poverty and deprivation
  - Often drought and famine
- Reasons for decline:
  - Forests cut down: erosion of soil
  - Water sources taken over by govt., but not maintained
  - Focus on large irrigation projects

Global Environmental Crisis

- Population
- Water and sanitation
- Biodiversity
- Forests
- Land
- Pollution
- Coastal zone and the ocean
- Natural disasters
- Energy, global warming, climate change
- Urbanization

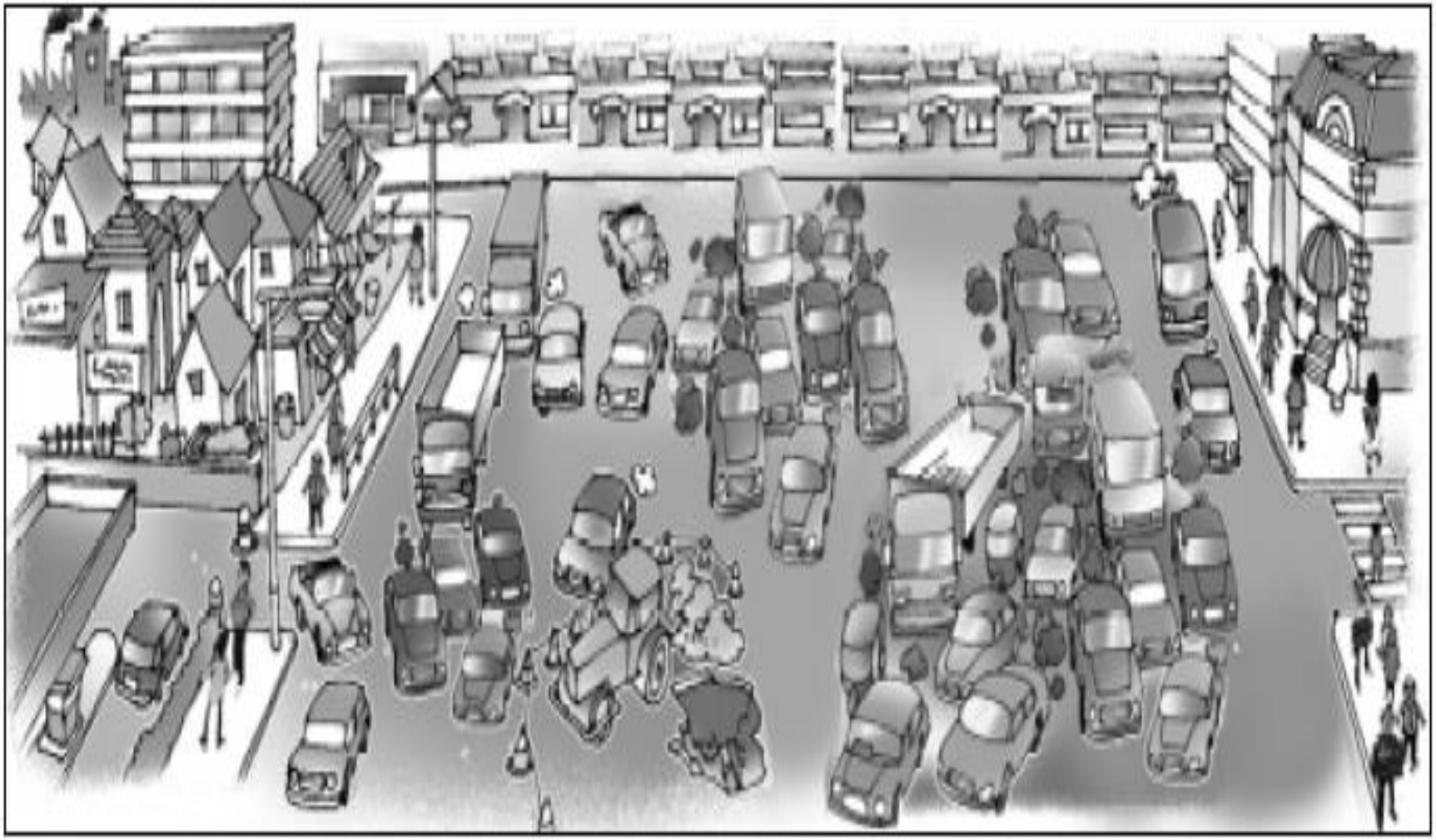
Pollution



Air pollution in a traffic jam in an Indian Metro

More than 60,000 Indian villages lack sources of drinking water

Urbanisation



Overcrowding in an urban area, slums and apartments, crowded streets, traffic jams, etc.

Methods of Public Awareness

The following methods may be used for propagating public awareness regarding the environment:

Formal Method

Introducing Environmental Education in Schools and colleges

Informal Method

- Mass Media (newspapers, magazines, radio, TV, etc.)
- Seminars and conferences
- Competitions
- Entertainment (folk songs, street plays, etc.)
- Science centres
- International co-operation

Ecological Footprint

- Area required to sustain indefinitely a person, a city, a country, etc.
- Accounts for the energy, food, water, and materials that are consumed and the wastes created.
- Humanity's Footprint is now more than 1.4. That is, we require 40% more than the earth's area to sustain our consumption!
- This Footprint is also increasing steadily.