

Multidisciplinary Nature of Environmental Studies

Environmental Studies

- Environment - is derived from an old French word '**ENVIRONNER**' which means **ENCIRCLE**.
- In real world everything that affects an organism during its life time is collectively known as its Environment.
- Environmental study: Involves the study and understanding that even a single phenomenon can affect the environment in a variety of ways with varying degrees of complexity.



Definitions

- **Environmental science - the study of how various species interact with one another and with the non-living environment (matter & energy).**
- **It is the study of interaction of the biotic component (plants, animals and micro-organisms) among themselves and together with the abiotic components (temperature, rainfall, relative humidity, soil, air, fire, and atmosphere).**

➤ **The complex set of physical, geographic, biological, social, cultural and political conditions that surround an individual or organism and that ultimately determines its form and nature of its survival.**



Environmental Science

An interdisciplinary branch of science that investigates questions related to the human population, resources, and damages caused by pollution and disturbance.

Environmental science is integrative and involves complex biology, chemistry, politics, sociology, geology, agriculture, economics.

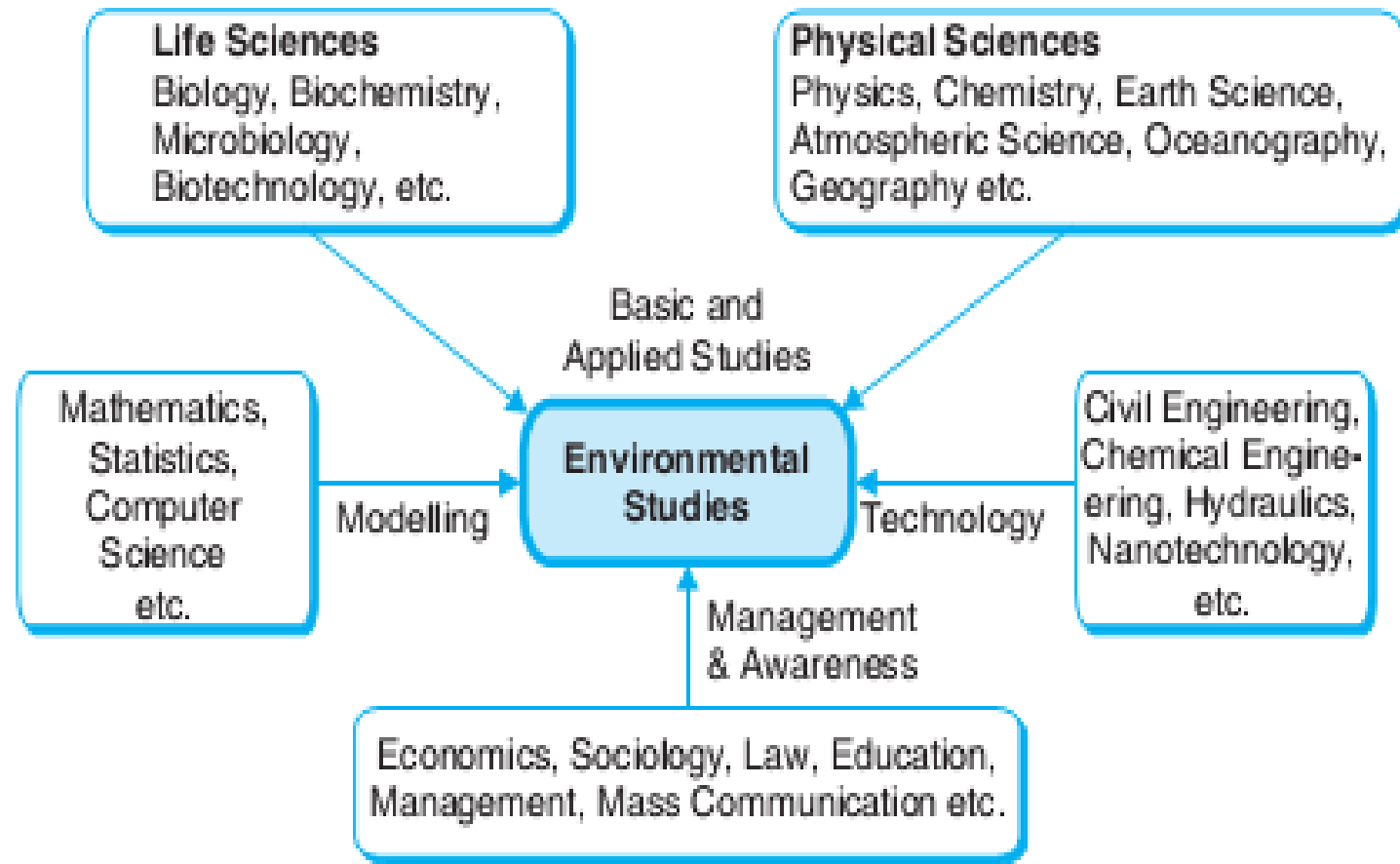
Why it is necessary to learn about the state of environment?

- To conserve biodiversity, to lead more sustainable lifestyles and to use resources more equitably.
- **Biodiversity:** The part of nature which includes the variety and richness of all plant and animal species at different scales in space *i.e.* Local, regional, country wise and global, and various types of ecosystems - both terrestrial/land and aquatic - within a defined area.
- **Sustainable development:** Implies the use of resources in a managed way as to provide resources for future generations.

Objective of This Course

- **Develop a concern for our environment.**
- **Begin to act at your own level to protect the environment where we live in.**

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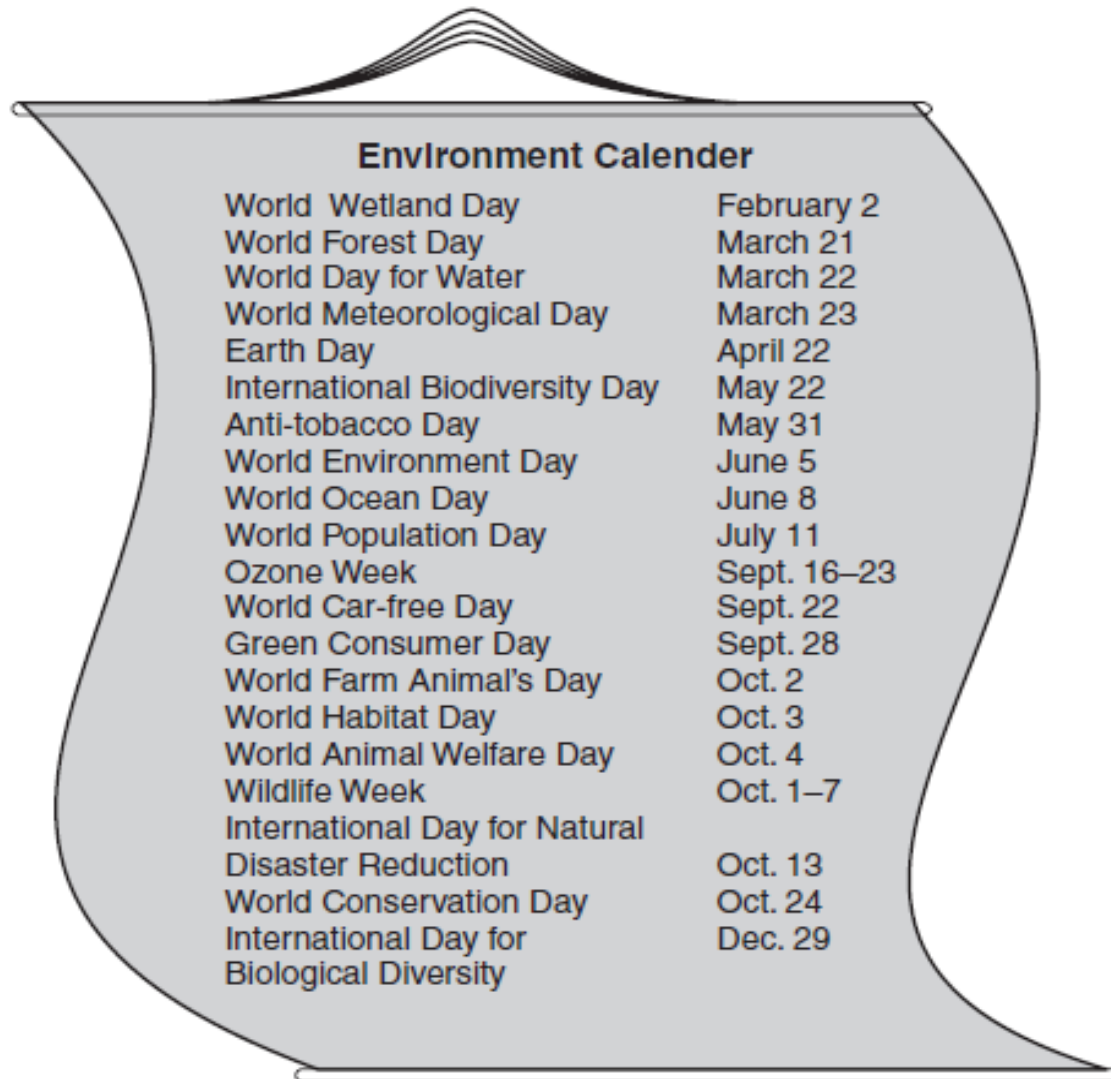


ES requires skills that encompass a range of disciplines including chemistry, biology, earth sciences, atmospheric science, statistics, mathematics, and geography.

Scope/possibility and Importance

- **Resources:** renewable (forest and water) and non-renewable (minerals and oil).
- Due to the increase in population these resources are getting depleted gradually.
- Need to understand about our natural assets and sustainably utilize the resources.
- Scope of environmental studies is very wide and nearly covers some aspects of every major discipline (biology, chemistry, physics, geography, resource management, economy, etc.).

Environmental Calendar



| Environment Calender | |
|-----------------------------------------------------|-------------|
| World Wetland Day | February 2 |
| World Forest Day | March 21 |
| World Day for Water | March 22 |
| World Meteorological Day | March 23 |
| Earth Day | April 22 |
| International Biodiversity Day | May 22 |
| Anti-tobacco Day | May 31 |
| World Environment Day | June 5 |
| World Ocean Day | June 8 |
| World Population Day | July 11 |
| Ozone Week | Sept. 16–23 |
| World Car-free Day | Sept. 22 |
| Green Consumer Day | Sept. 28 |
| World Farm Animal's Day | Oct. 2 |
| World Habitat Day | Oct. 3 |
| World Animal Welfare Day | Oct. 4 |
| Wildlife Week | Oct. 1–7 |
| International Day for Natural Disaster Reduction | Oct. 13 |
| World Conservation Day | Oct. 24 |
| International Day for Biological Diversity | Dec. 29 |

Scope/possibility of Environmental Studies

- | Ecosystem structure and function**
- | Natural resource conservation**
- | Environmental pollution control**
- | Environmental management**
- | Environmental impact assessment**
- | Research and development**
- | Social development**
- | Forest management**
- | Environmental consulting firms**

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 (fix the tax or decide the value) 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.**

Factors Affecting Environmental Problems

- Rapid population growth
- Degradation of parts of earth's life support systems.
- Poverty
- Wide-spread use of fossil fuels (coal and oil).
- Rapid and indiscriminate use of resources with too little emphasis/importance on pollution prevention and waste reduction.

Major Environmental Problems

- Air Pollution
- Water Pollution
- Biodiversity Degradation
- Waste generation
- Food Supply Problems

Steps for environmental protection

- 1. To reduce world consumption of fossil fuels**
- 2. To reduce and clean up all sorts of pollution with future goal of zero pollution**
- 3.Emphasis(special importance) on clean, alternative energy sources that have low carbon emissions**
- 4. Sustainable use of water, land, and other scarce resources**
- 5. Preservation of existing endangered species**
- 6. Protection of biodiversity**

Challenges in agriculture

- **Technology expanded food production**
 - **Leading to increased population and consumption**
- **One of humanity's greatest achievements, but it comes at an enormous environmental cost**
- **Nearly half of the land surface is used for agriculture**
- **Chemical fertilizers and pesticides poison and change natural systems**
- **Erosion, climate change and poor management destroy millions of acres each year**

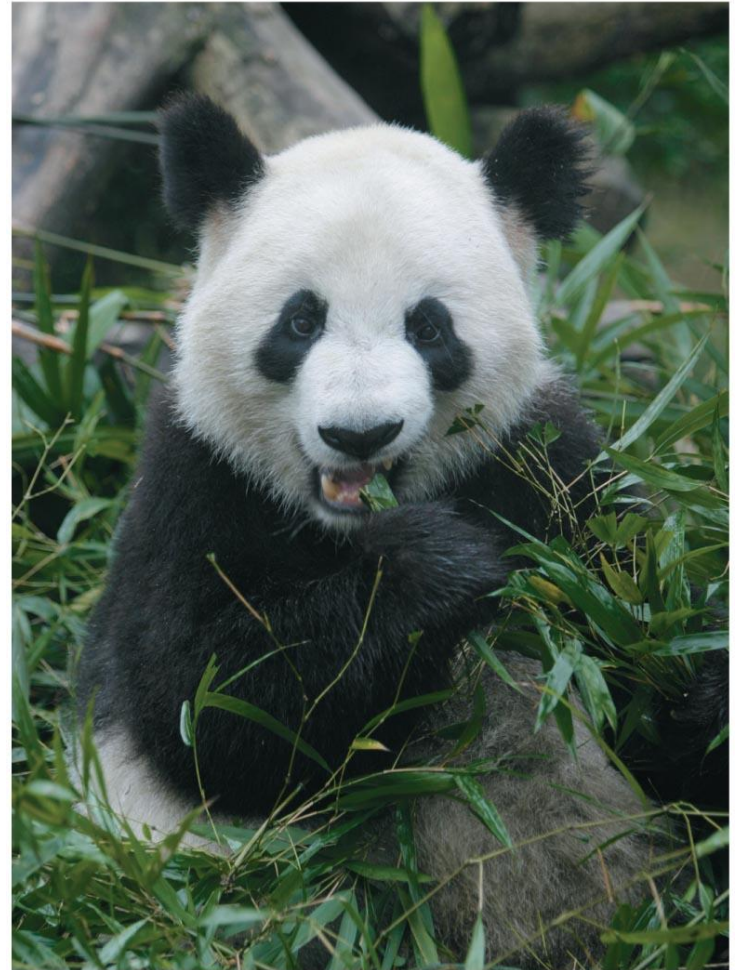
Challenges in pollution

- **Waste products and artificial chemicals**
 - Used in farms, industries, and households
 - Contaminate land, water and air
 - Kill millions of people
- **Humans are affecting the Earth's climate**
 - Melting glaciers
 - Rising sea levels
 - Impacted wildlife, forests, health and crops
 - Changed rainfall and increased storms

Since the Industrial Revolution, atmospheric CO₂ concentrations have risen by 39%, to the highest level in 800,000 years.

Challenges in biodiversity

- **Biodiversity:** The cumulative number and diversity of living things
- Human actions have driven many species extinct
- Biodiversity is declining dramatically



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Biodiversity loss may be our biggest problem; once a species is extinct, it is gone forever

Challenges in Energy Sector

- **The lives we live today are due to fossil fuels**
 - Machines
 - Chemicals
 - Transportation
 - Products
- **Fossil fuels are a one-time bonanza**
 - Supplies will certainly decline

We have used up 1/2 of the world's oil supplies; how will we handle this imminent fossil fuel shortage?

Sustainable solutions around

We must develop solutions that protect both our quality of life and the environment

- **Renewable energy**
- **Organic agriculture**
- **Legislation and technology to reduce pollution**
- **Protect species and their habitat**
- **Recycling and reducing waste**
- **Decrease greenhouse gas emissions**



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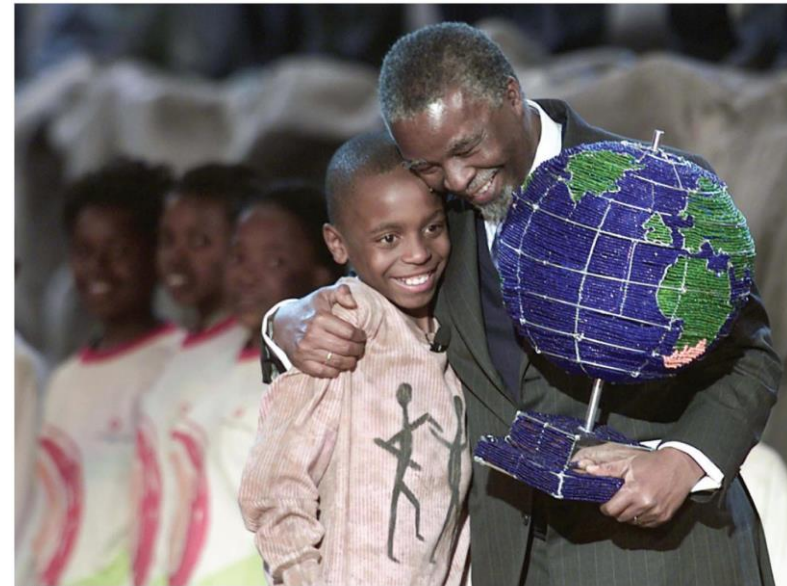
Sustainable development

- **Development: purposeful changes to improve the quality of life**
- **Sustainable development:**
 - **Involves environmental protection, economic well-being and social equity.**
 - **the use of resources to satisfy current needs without compromising future availability of resources**

Can we develop in a sustainable way?

- **The triple bottom line: sustainable solutions that meet**
 - **Environmental protection**
 - **Economic goals**
 - **Social equity**
- **Humans must apply knowledge from the sciences to**
 - **Limit environmental impacts**
 - **Maintain functioning environmental systems**

We must make an ethical commitment to current and future generations



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Take home lesson

- **Environmental science helps us understand our relationship with the environment**
- **It helps us find balanced solutions to environmental challenges**
- **Solving environmental problems can move us towards health, longevity, peace and prosperity**
- **Sustainable development is what we are looking for.**