

### Ecology:

Ecology is the study of the relationships between living organisms, including humans, and their physical environment. Ecology considers organisms at the individual, population, community, ecosystems, and biosphere level. Ecology overlaps with the closely related sciences of biogeography, evolutionary biology, genetics, ethology and natural history. Ecology is a branch of biology, and it is not synonymous with environmentalism.

Among other things, ecology is the study of:

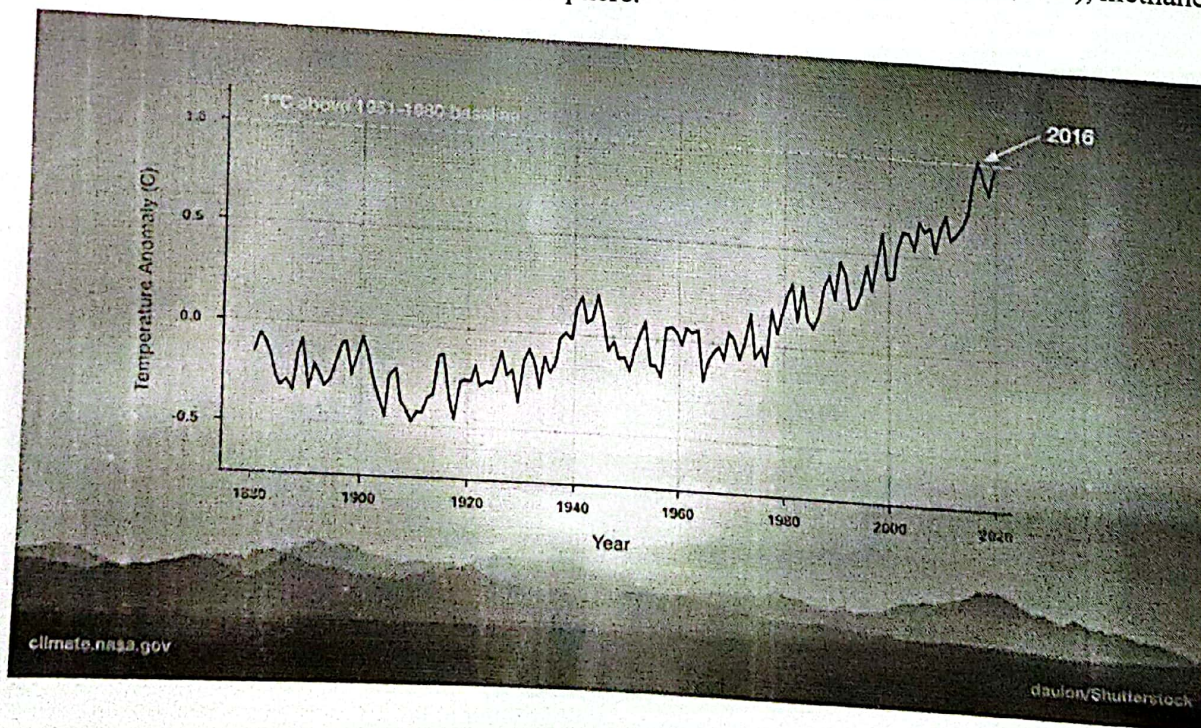
- Life processes, antifragility, interactions, and adaptations
- The movement of materials and energy through living communities
- The successional development of ecosystems
- Cooperation, competition, and predation within and between species.
- The abundance, biomass, and distribution of organisms in the context of the environment.
- Patterns of biodiversity and its effect on ecosystem processes

Ecology has practical applications in conservation biology, wetland management, natural resource management (agroecology, agriculture, forestry, agroforestry, fisheries), city planning (urban ecology), community health, economics, basic and applied science, and human social interaction (human ecology).

### Global Warming:

Global warming is the long-term heating of Earth's climate system observed since the pre-industrial period (between 1850 and 1900) due to human activities, primarily fossil fuel burning, which increases heat-trapping greenhouse gas levels in Earth's atmosphere.

Global warming, the gradual heating of Earth's surface, oceans and atmosphere, is caused by human activity, primarily the burning of fossil fuels that pump carbon dioxide (CO<sub>2</sub>), methane and other greenhouse gases into the atmosphere.



This graph illustrates the change in global surface temperature relative to 1951-1980 average temperatures (Source: [NASA's Goddard Institute for Space Studies](#)). Learn more about global surface temperature [here](#). Credit: NASA/JPL-Caltech

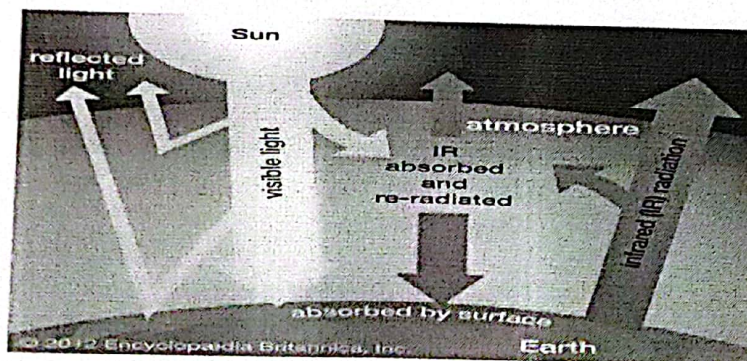
### Climate Change:

Climate change is a long-term change in the average weather patterns that have come to define Earth's local, regional and global climates. These changes have a broad range of observed effects that are synonymous with the term.

Changes observed in Earth's climate since the early 20th century are primarily driven by human activities, particularly fossil fuel burning, which increases heat-trapping greenhouse gas levels in Earth's atmosphere, raising Earth's average surface temperature. These human-produced temperature increases are commonly referred to as global warming. Natural processes can also contribute to climate change, including internal variability (e.g., cyclical ocean patterns like El Niño, La Niña and the Pacific Decadal Oscillation) and external forcings (e.g., volcanic activity, changes in the Sun's energy output, variations in Earth's orbit).

### Greenhouse effect on Earth:

Some incoming sunlight is reflected by Earth's atmosphere and surface, but most is absorbed by the surface, which is warmed. Infrared (IR) radiation is then emitted from the surface. Some IR radiation escapes to space, but some is absorbed by the atmosphere's greenhouse gases (especially water vapour, carbon dioxide, and methane) and reradiated in all directions, some to space and some back toward the surface, where it further warms the surface and the lower atmosphere.



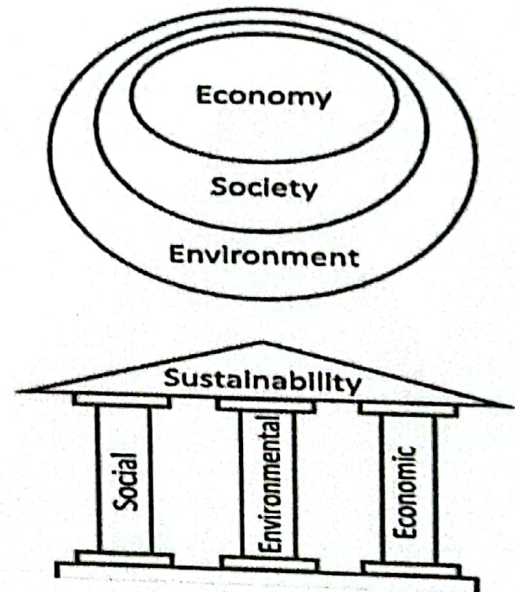
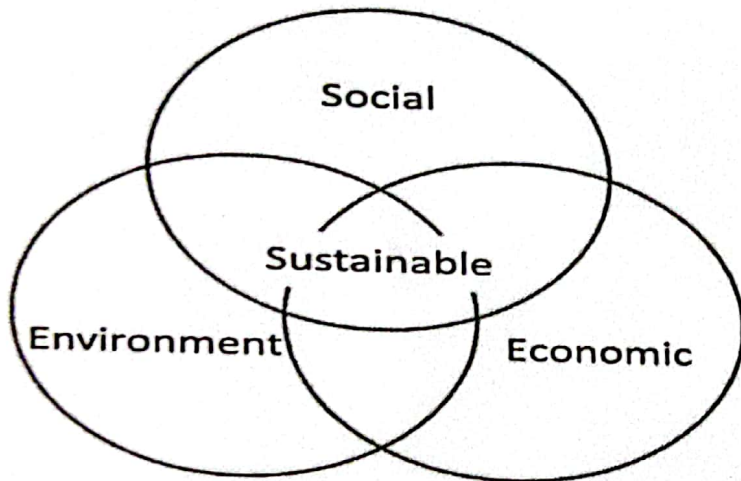
### Biodiversity:

Biodiversity is the shortened form of two words "biological" and "diversity". It refers to all the variety of life that can be found on Earth (plants, animals, fungi and micro-organisms) as well as to the communities that they form and the habitats in which they live.

### Sustainability:

Sustainability is a broad policy concept in the global public discourse that consists of three main "dimensions" or "pillars": environmental, economic and social.

The original semantic meaning of "sustainability" (a noun) and "to sustain" (a transitive verb) refers to the ability to continue over a long period of time. A closely related and overlapping concept is that of "sustainable development". UNESCO formulated a distinction as follows: "Sustainability is often thought of as a long-term goal (i.e., a more sustainable world), while sustainable development refers to the many processes and pathways to achieve it." According to the "Brundtland Report" Our Common Future (1987), sustainable development is defined as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs."



# Questions

1. Define Environment. Give example of different type of Environmental component.
2. What is Environmental Engineering? What are the fields of environmental Engineering?
3. What is Environmental Resource? Give example of different type of resource.
4. What is Environmental Problem? Describe different type of environmental problems.
5. What do you understand by Sustainability? Why is Sustainability important for environment?
6. "Environment is getting worse day by day" Are you agree with this statement? Justify your answer.