

**Environmental Studies and Disaster Management**  
(Semester - II)

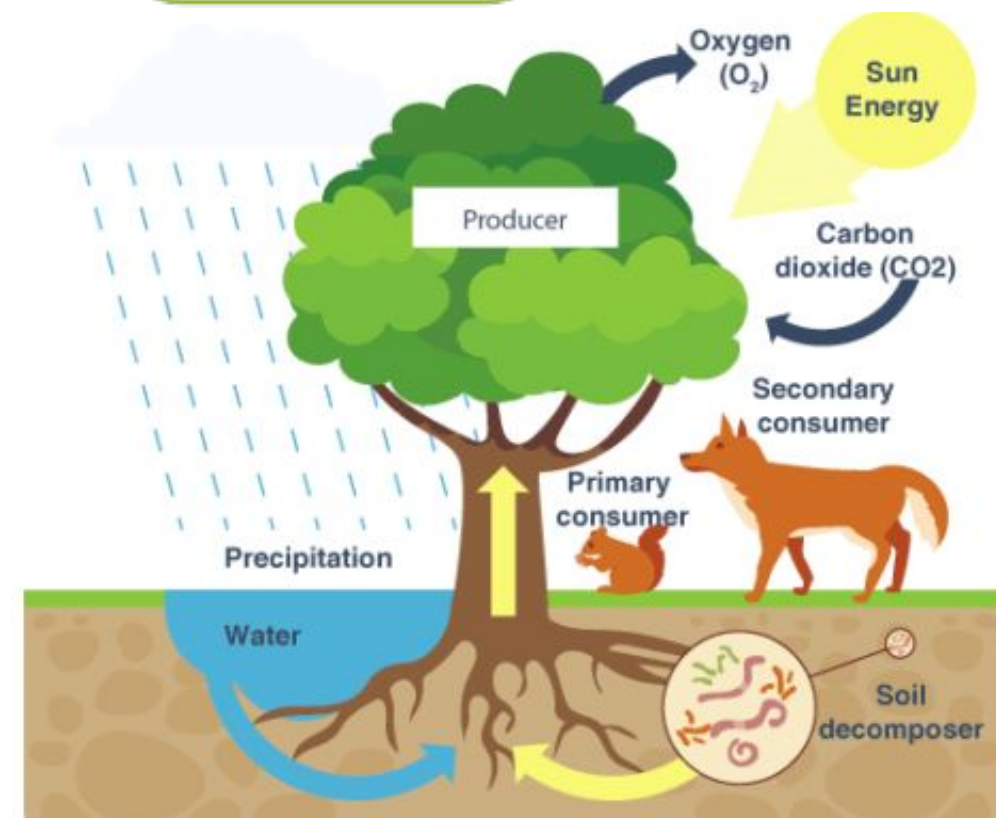
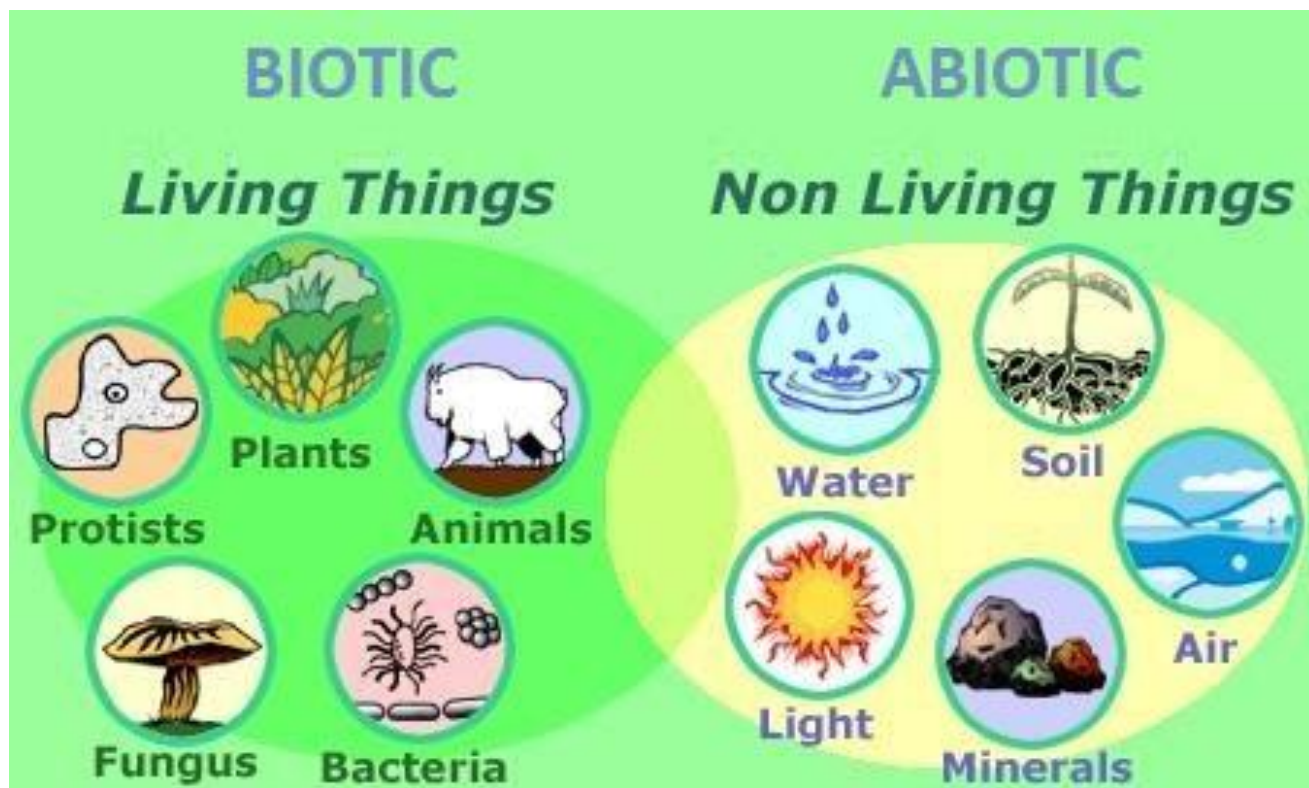
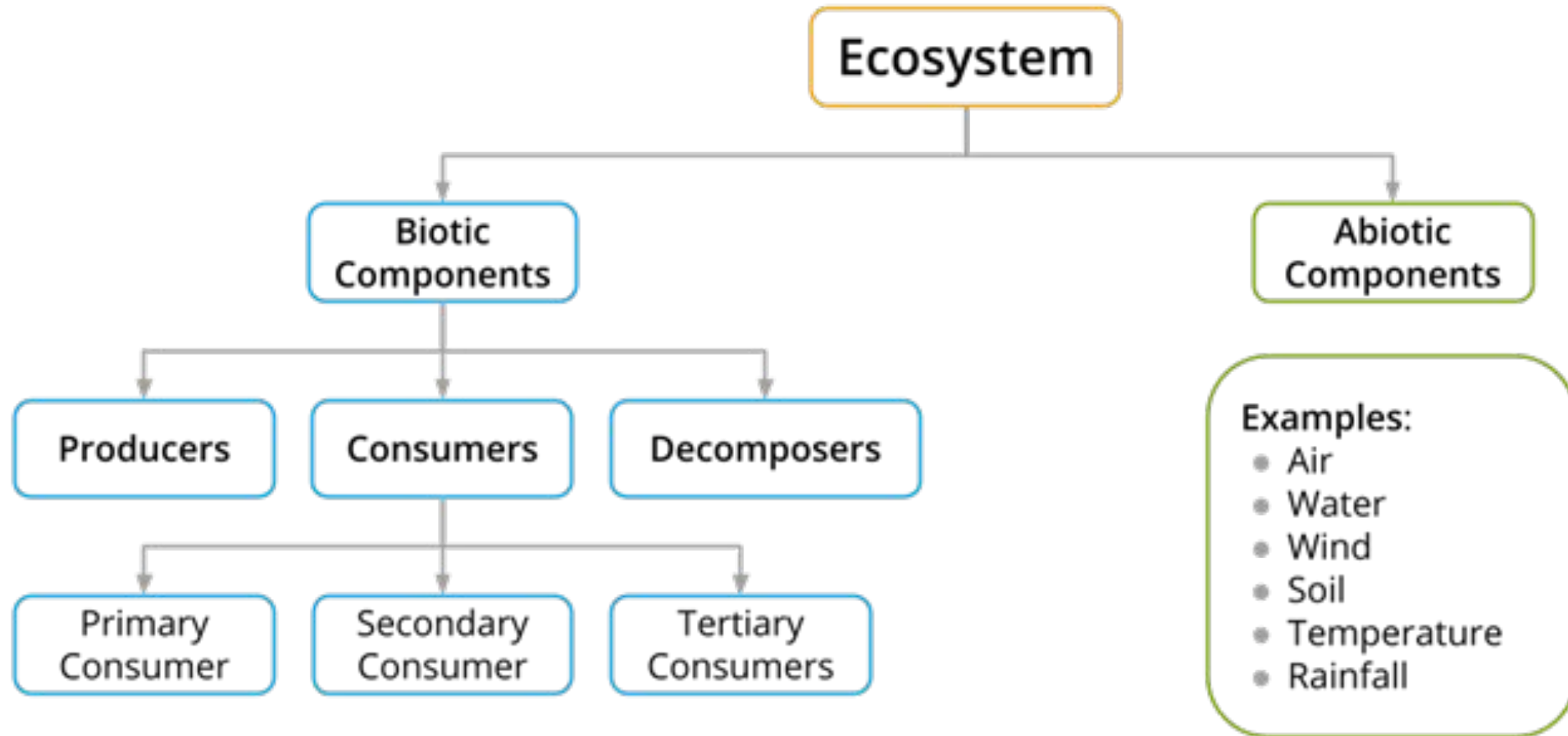
# Introduction to Ecology and Ecosystem

**Ecology** is the study of the relationships between living organisms and their physical environment.

**Ecosystems** are composed of living and nonliving components interacting as a system.

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# Understanding the Concept of Sustainable Development

## Environmental Preservation

Sustainable development aims to meet present needs without compromising the ability of future generations to meet their own needs.

## Economic and Social Equity

It involves improving the quality of life for all while ensuring fairness across different communities and socio-economic groups.

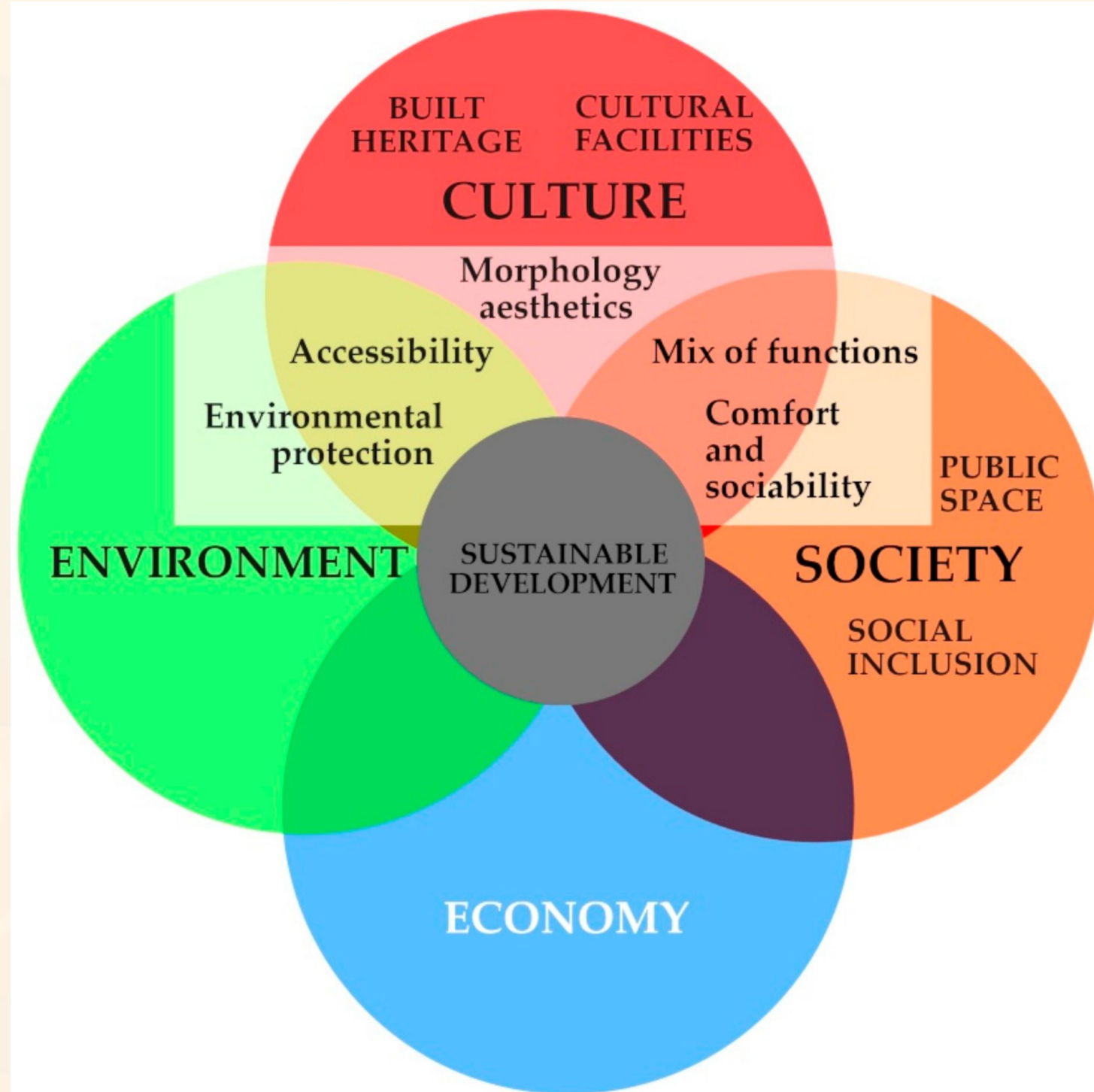
## Resource Conservation

The concept emphasizes the responsible use of natural resources, reducing waste, and promoting recycling and reuse.

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# Importance of Sustainable Development

## 1 Environmental Preservation

Ensures a healthy planet for future generations by reducing pollution and protecting natural resources.

## 2 Social Well-being

Promotes equality, human rights, and improved access to education, healthcare, and sanitation.

## 3 Economic Stability

Encourages sustainable economic growth, creates job opportunities, and boosts development without causing harm to the environment.

## The concept of sustainability



# Sources of Renewable Energy

## Solar Power

Energy harnessed from the sun through photovoltaic cells or solar thermal systems.

## Wind Energy

Generated from the natural movement of the wind through wind turbines.

## Hydropower

Derived from the energy of flowing or falling water. It's a clean and sustainable energy source.



*Solar energy*



*Wind energy*



*Hydroelectricity*

# Advantages of Renewable Energy

## 1 Reduced Greenhouse Gas Emissions

Renewable energy sources produce lower levels of greenhouse gases compared to fossil fuels.

## 2 Energy Security

Reduces dependence on imported fuels and enhances energy self-sufficiency. It also diversifies the energy mix.

## 3 Job Creation

Leads to employment opportunities in the design, installation, and maintenance of renewable energy systems.

# Disadvantages of Renewable Energy

## Intermittency

Renewable sources are dependent on weather conditions, resulting in variability and unpredictability of power generation.

## Land Use

Some renewable technologies require vast land areas, which can lead to habitat loss and visual impact.

## Initial Costs

High upfront costs for installation and equipment can deter widespread adoption of renewable energy.

