

# ENVS-2023

## 2<sup>nd</sup> SEM Program

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Lecture 1

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# Syllabus

## **Unit 1: Basic of environmental Studies:**

Definition, Nature, Scope and Importance; Components of environment: Environmental education.

## **Unit 2: Natural Resources: Renewable and non- renewable resources**

Nature and Natural resources their conservation and associated problems: Forest resources: Uses, types and importance, Joint Forest Management & Tribal population, Deforestation and its effects. Water resources: Distribution of water on Earth: Use, Over exploitation of surface and ground water; Dams: benefits and problems; Flood & drought. Mineral resources: Mineral resources in India, Use and exploitation, Social impacts of mining. Food resources: World food problems and food insecurities. Energy resources: Renewable and Nonrenewable energy sources, use of alternate energy sources, Case studies. Land resources: Land as a resource; Land degradation, Landslides, Soil erosion and Desertification. Use of resources for sustainable development.



“Small acts,  
when  
multiplied by  
millions of  
people, can  
transform the  
world.”



Importance of environmental studies

**The world is **changed** by your  
example, not by your **opinion**.**  
- Paulo Coelho

# Why Environmental studies?

- Our environment is very important to us because it is where we live and share resources with other species.
- Environmental science is the study of interactions among the physical, chemical and biological components of the environment.
- Environmental science enlightens us on how to conserve our environment in the face of increasing human population growth and anthropogenic activities that degrade natural resources and ecosystems.

- Environmental studies are the study of social sciences to understand human interactions with the environment.
- Environmental engineering is the focus on analyzing and deducing problems with the environment and the effect of man-made programs on the environment, and for finding solutions to help protect and preserve the environment by disposing of pollution in the air, water, and land.

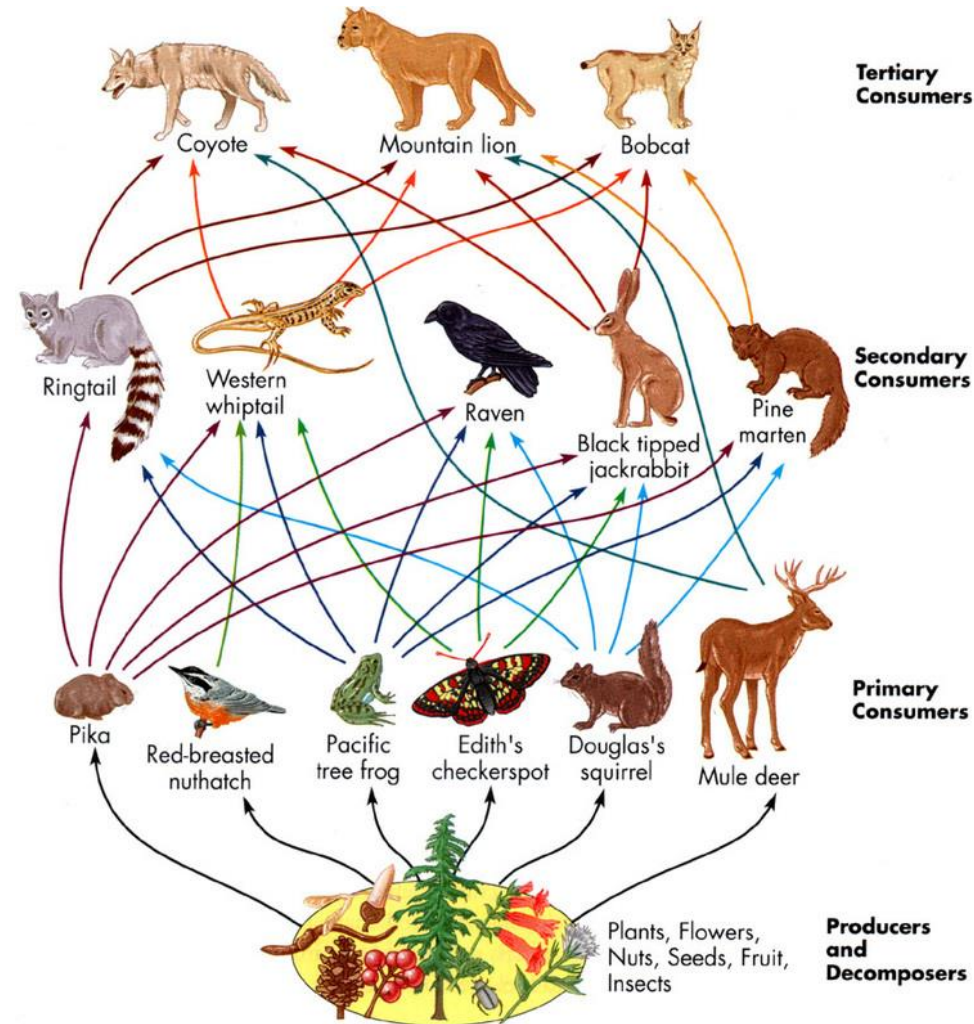
- In environmental sciences or studies, ecologists study how plants and animals interact with each other, chemists study the living and non-living components of the environment, geologists study the formation, structure, and history of the earth, biologists study the biodiversity, physicists are involved in thermodynamics, computer scientists are involved in technical innovations and computer modeling and biomedical experts study the impact of environmental issues on our health and social lives.

# Importance of Environment Studies

- To Realize That Environmental Problems are Global
- To Understand the Impacts of Development on the Environment
- To Discover Sustainable Ways of Living: utilizing present resources in a manner that conserves their supplies for the future.
- To Utilize Natural Resources Efficiently
- To Shed Light on Contemporary Concepts Such as How to Conserve Biodiversity
- To Learn and Create Awareness About Environmental Problems at Local, National and International Levels



# How can you preserve biodiversity?



- Using sustainable wood products
- Using organic foods
- Embracing the 3R's, reduce, reuse, and recycle
- Purchasing sustainable seafood
- Supporting conservation campaigns at local levels
- Conserving power
- Utilizing eco-friendly cleaning products
- To understand the interrelationship between organisms in population and communities

# THE 3R'S OF ORGANICS:

## REDUCE

Prevent and reduce food waste.

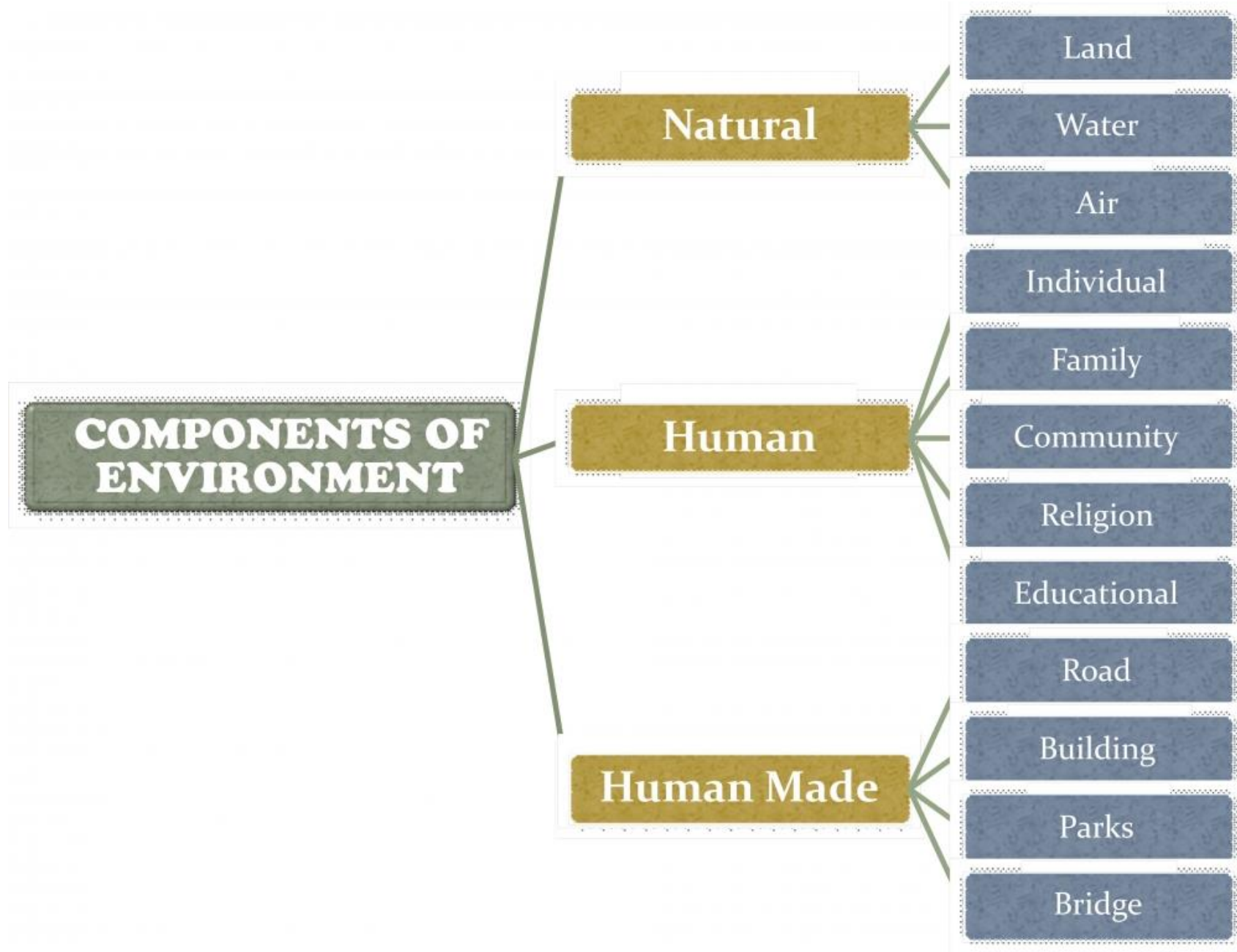
## REUSE

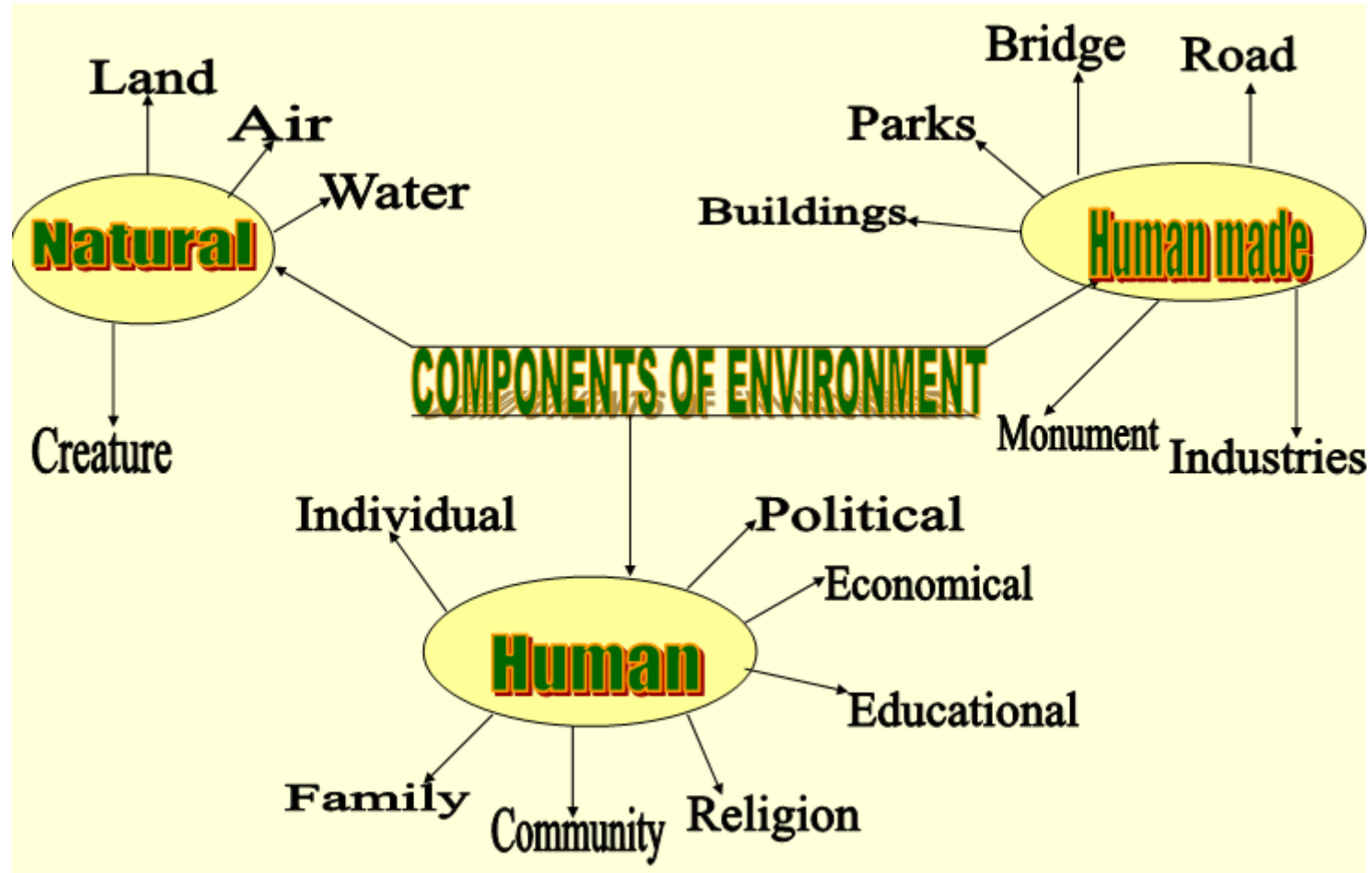
Redistribute surplus, edible food to feed people.

## RECYCLE

Recycle nutrients through composting. Anaerobic digesters create compost while capturing methane and creating "energy-from-recycling."







# Environment?

- ‘A person’s environment consists of the sum total of the stimulation which he receives from his conception until his death.’
- It can be concluded from the above definition that Environment comprises various types of forces such as physical, intellectual, economic, political, cultural, social, moral and emotional. Environment is the sum total of all the external forces, influences and conditions, which affect the life, nature, behavior and the growth, development and maturation of living organisms.

# The environment consists of four segments

**1. Atmosphere:** The atmosphere implies the protective blanket of gases, surrounding the earth:

(a) It sustains life on the earth.

(b) It saves it from the hostile environment of outer space.

(c) It absorbs most of the cosmic rays from outer space and a major portion of the electromagnetic radiation from the sun.

(d) It transmits only here ultraviolet, visible, near infrared radiation (300 to 2500 nm) and radio waves. (0.14 to 40 m) while filtering out tissue-damaging ultraviolet waves below about 300 nm.

**2. Hydrosphere:** The Hydrosphere comprises all types of water resources oceans, seas, lakes, rivers, streams, reservoir, polar icecaps, glaciers, and ground water.

(i) Nature 97% of the earth's water supply is in the oceans,

(ii) About 2% of the water resources is locked in the polar icecaps and glaciers.

(iii) Only about 1% is available as fresh surface water-rivers, lakes streams, and ground water fit to be used for human consumption and other uses.



**3. Lithosphere:** Lithosphere is the outer mantle of the solid earth. It consists of minerals occurring in the earth's crusts and the soil *e.g.* minerals, organic matter, air and water.

**4. Biosphere:** Biosphere indicates the realm of living organisms and their interactions with environment, viz atmosphere, hydrosphere and lithosphere.

# Element of Environment

**(1) Physical elements:** Physical elements are as space, landforms, water bodies, climate soils, rocks and minerals. They determine the variable character of the human habitat, its opportunities as well as limitations.

**(2) Biological elements:** Biological elements such as plants, animals, microorganisms and men constitute the biosphere.

**(3) Cultural elements:** Cultural elements such as economic, social and political elements are essentially manmade features, which make cultural milieu.

# Unit 2: Natural Resources: Renewable and non-renewable resources

# Natural resources

Natural resources are the substances which are inherent to earth and obtained from nature and utilized to create products and services which are useful for human beings. Forests, water, air, soil, etc. are natural resources.



## Types of Natural Resources



Sun



Forest



Rock



Minerals



Animals



Air



Oil



Water



Soil

# Renewable and Non-renewable energy

The resources that can be harvested continuously with proper planning and management are called renewable resources. Example: plants, animals, solar energy , wind energy, etc.

Non Renewable resources are natural resources which are limited in supply and cannot be replenished by natural means. Once exhausted, they have very little chance of recovery or resynthesis. Coal, minerals, petroleum, etc. are Non Renewable resources.

# Renewable and Non-Renewable Energy Sources

## Renewable energy



Solar



Biomass



Hydropower



Geothermal



Wind

## Non-renewable energy



Oil



Coal



Nuclear



Natural gas

# Major Natural Resources

**Forests Resources**

**Water Resources**

**Land Resources**

**Mineral Resources**

**Energy Resources**

**Food Resources**



# Forest Resources

A forest , a biotic community with predominance of trees is an important Renewable natural resource.



# Benefits of forests

- Forest Provide protection against Soil erosion, Droughts, floods, noise, radiations
  - Forest Provide various products like, gum resins, medicines, Katha, honey, pulp, bamboo, timber, and fruits
  - The Forest regulates the level of Oxygen and carbon dioxide in atmosphere. The forests also help in regulating temperature conditions
  - Seeds for vegetation.
- It provide direct and indirect employment.

# Benefits of forests

- It provide direct and indirect employment. Benefits of Forests  
Clean water, conversion CO<sub>2</sub> into wood (stored carbon),  
Reduce wind and noise, improve air quality, transform degraded  
areas, shelter, stabilize agriculture land.

# Deforestation

Deforestation is removal or reduction in forest cover.

- Encroachment of forest land for agricultural purposes
- Expansion of cities.
- Construction of dams, canals and highways
- Establishment of industrial areas
- Demand for firewood
- Mining    Shifting Cultivation
- Forest Fires

- **Manly cause**

- Timber extraction, Building Dams,
- Construction waterways



# Effects of deforestation

- Loss of natural habitat of wild animals and plants
- Increased intensity and frequency of natural disasters
- Land Degradation
- Change in climatic conditions
- Siltation of rivers and canals
- Loss of revenue
- Change in water cycle and reduced rainfall
- Increase socio economic problems

# Controlling deforestation

- United nation and world bank.
- Reforestation is also being encouraged.
- Special legislation to protect forest land.
- Environment clearance is mandatory for big industry

# Water Resources

## Hydrosphere

## Source of water

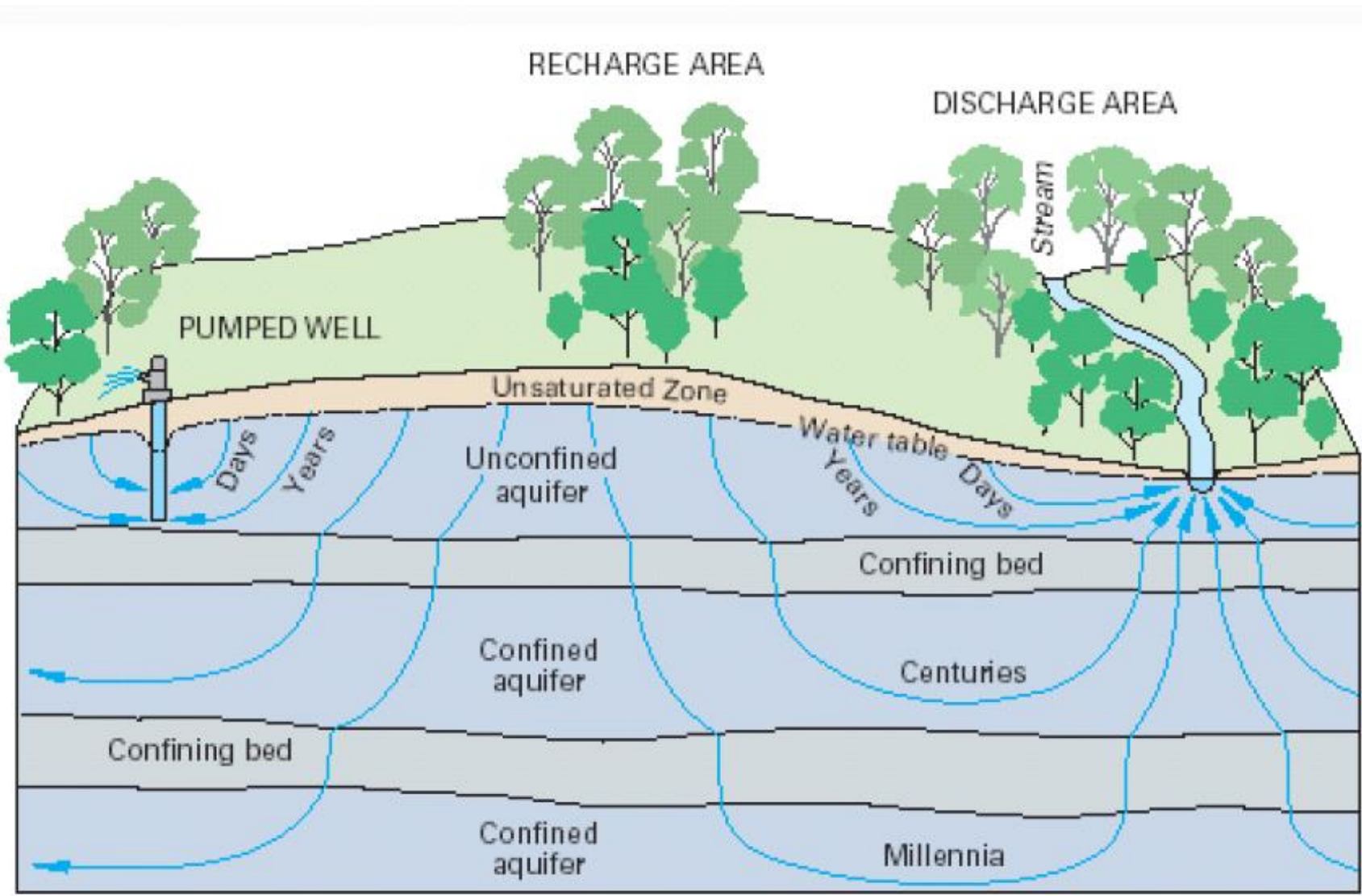
- Surface water: ocean, seas, ponds, river
- Underground water: streams, well, borewell
- **Use and Over Exploitation of Surface**

## **and Ground water**

- Waste and byproduct from industries
- Disposal of municipal waste in river cause major loss of clean water
- Agriculture waste, pesticide, fertilizer.







RECHARGE AREA

DISCHARGE AREA

PUMPED WELL

Stream

Unsaturated Zone

Unconfined aquifer

Water table

Confining bed

Confined aquifer

Centuries

Confining bed

Confined aquifer

Millennia

Days  
Years

Years  
Days

## Water Calamities: Floods and Droughts

- Floods damage to water supply, sewage disposal system.
- Affect human health
- Damage properties and infra.
- Rapid speed leads to landslide
- It cause respiratory diseases due consumption of polluted water.
  
- Increase physical and emotional stress.
- Disturbed transport system, food shortage
- Releases of cheical **Chemicals**
- migration

# Floods

Floods refers to the presence of unusually large amount of water at any place or more water that can be handled by the drainage of the area. The various types of floods are

Flash Floods

River floods

Coastal Floods



## Drought

A drought is a condition in which a region suffers from a severe scarcity in its water availability.

- Water resources depleted
- Loss of live stock affect local economy.
- According to United Nation Food and Agriculture Organization, 1.2 billion people, 20% earth population suffered
- Draught change in routine weather patter.



## Dams: Benefits and Problems



## What do dams provide ?

Electricity

Irrigation Navigation

Flood Control

Beautiful landscape

Demands for drinking and other consumption needs

Water wastage regulated

# Disadvantages/Adverse Effects of Dams

Deforestation and loss of biodiversity

Sinking of agricultural and forest land

Displacement of tribals from their home land

Growth of aquatic weeds

Siltation of reservoirs due to degraded catchment conditions

Increase in water borne and soil borne diseases

Increase flash floods and affect entire ecosystem,

Increased water logging and salinity

Emissions of greenhouse gases,

Accumulation of toxic materials.

## Mineral Resources

Minerals are naturally occurring chemical compounds, which are formed through inorganic processes under the crust of the earth.

Minerals are non-renewable resources





## Types of Minerals

**Metallic Minerals:** copper, aluminum, iron etc.

**Industrial Materials:** lime, potash, salt

**Construction Materials:** sand, stone, gravels

**Energy Minerals:** coal, oil, gas, heavy radioactive metals

# Environment Effect of Mining

It support 7-9% on GDP

## **Basic Activity:**

1. Geophysical survey
2. mapping
3. Sampling
4. Drilling
5. Modelling
6. Feasibility

## **Mine safety:**

Strong global and local legislation

Synthetic building material reduce load on natural rocks.

New technology at power plant, ignition engine

Tree plantation

## **Mine effect on environment:**

It pollute the environment.

It produce large waste

Destruction of forest

Mining lowers water table

trace metals.

Onshore mining badly effect marine life

Soil erosion

Pollution of air, water and land.

Emission of radioactive pollutants, ash and

# Food Resources

Natural or artificially produced materials, which are used as food to derive metabolic energy, are called as food resources.



## Type of Food

1 Agricultural Crops

2 Livestock 3 Fish

4 Others (Mariculture based)

## World Food Problems (Food security act 1999)

Insufficient production Lack of  
irrigation facility High oil prices

Under nutrition and malnutrition Hoarding

Food used to biofuel Climate change

Over population War poverty

### Food Problems solution:

Increase food production control population

Altering food pattern Food human right



## Causes of Food Problems

Increased Population

Unfavorable Climatic Conditions

Adverse geographical Conditions

Infertile soil

Disasters such as Floods, drought, earthquakes, storms, etc.

Lack of transportation High cost of grains

Insufficient distribution system

## **Environmental Effects of Modern Agriculture-Green revolution**

Definition- Green revolution is the successful agriculture experiments which can help to produce more food.

### **Stages in Green revolution**

Continuous expansion of farming area. More cropping  
Produce seed with improve genetics. Use of NABARD, ICAR

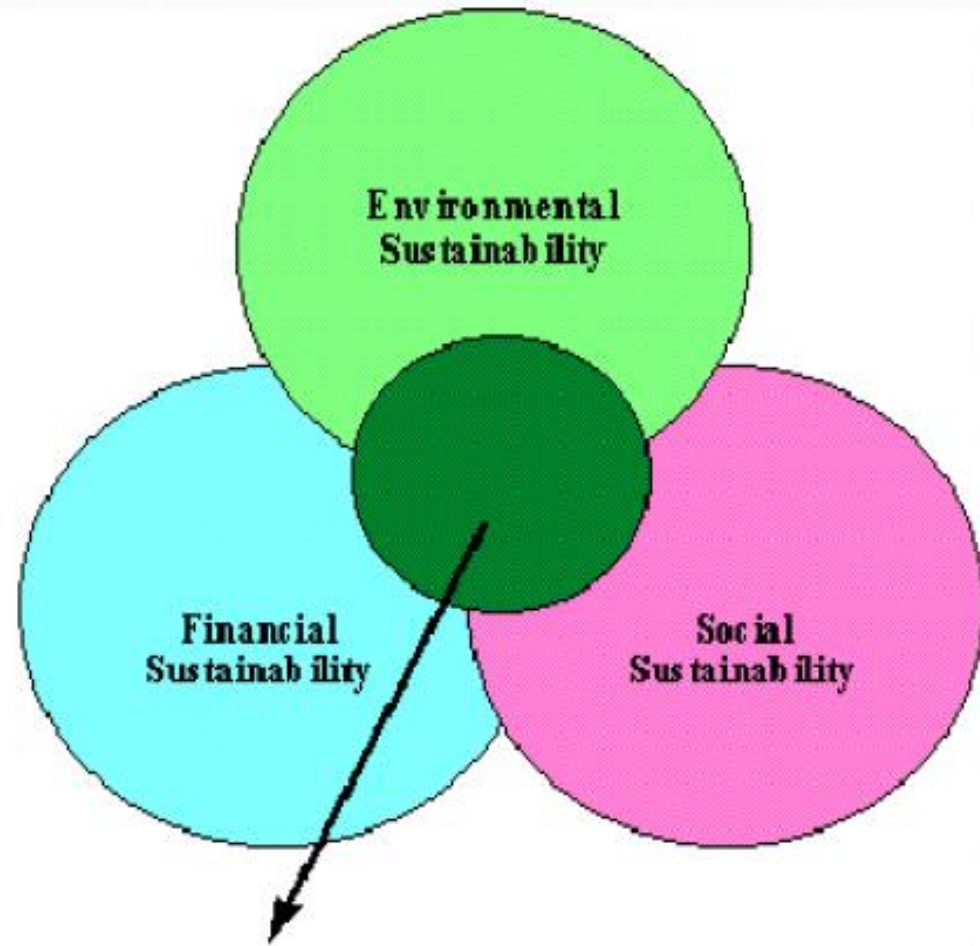
### **Advantages of Green revolution**

1. High quality seed.
2. Use irrigation or controlled water supply
3. Use of fertilizer and pesticide
4. Management of farming activity
5. create more job.

### **Disvantages of Green revolution**

1. Human health due to use of pesticide etc.
2. Soil quality

# Sustainable agriculture: the need of the hour



**SUSTAINABLE AGRICULTURE**



# MCQs Link

[Environmental Studies MCQs | MCQs on Environmental Studies \(byjus.com\)](#)

[Environmental science MCQ \(Multiple Choice Questions\) – JavaTpoint](#)

[Environmental Studies MCQs \(unacademy.com\)](#)

