

Assignment - 2

Part A) Q1) What do you mean by Super Pests:

Ans Super pests refer to insect pests that have developed resistance to multiple types of pesticides or other forms of pest control, making them difficult to manage.

These pests can cause significant damage to crops and pose a serious threat to agriculture and food production.

Q2) Define Nuclear fusion and Nuclear fission.

Ans Nuclear fusion - It is the process in which two light atomic nuclei combine to form a heavier nucleus.

- * Releases a large amount of energy in the process
- Example - fusion of H nuclei in the core of Sun to form He.

Nuclear fission -

It is the process in which a heavy atomic nucleus splits into two smaller nuclei.

- * Release of neutrons and a significant amount of energy.

Example - Fission of U_r (235), Plutonium (239) in nuclear reactors.

Q3) What do you mean by Water loggings.

Ans Refers to the condition in which soil or land becomes saturated with water, to the extent that the normal supply of air to plant roots is disrupted.

Caused by heavy rainfall, poor drainage. This can cause lead to a reduction in the oxygen available to plants, affecting their growth and potentially leading to plant death.

Q4) Define Eutrophication.

Ans

It is the process by which a body of water becomes overly enriched with nutrients, particularly Nitrogen and phosphorus, leading to excessive growth of algae and other aquatic plants.

This nutrients overload can disrupt the natural balance of aquatic ecosystems and cause several negative environmental effects.

Q5) Define soil erosion and its types.

Ans It is the process by which the top layer of soil is removed or displaced by natural forces such as water, wind or human activities. This process can lead to loss of fertile soil, reduced agricultural productivity.

Types - (i) Water Erosion

(ii) Wind Erosion

(iii) Gravity Erosion

(iv) Human-Induced Erosion

Part B) Q1) What are the major causes and consequences of deforestation.

Ans

Major Causes -

* Agricultural Expansion:

Forests are cleared to create space for

plantation and cattle ranching.

- * Logging = demand for timber and wood products drives deforestation as forests are cut down for wood, paper etc
- * Infrastructure development = As cities expand, forests are often cleared to make way for housing, roads.
- * Mining = Mining for resources such as coal, oil, gold, often leads to large scale deforestation, as vast areas are cleared to access underground deposits.
- * Climate Change = Rising temp and prolonged droughts, often linked to climate change, can increase the frequency and intensity of forest fires, leading to deforestation.
- * Overpopulation - Population growth increases demand for land.

Major Consequences -

- * Loss of biodiversity - Deforestation destroys habitats, leading to extinction of many plant and animal species
- * Ecosystem imbalance - Loss of key species can disrupt entire ecosystem.
- * Climate Change - Forests act as carbon sinks, when forests are cleared, carbon stored in trees is released as CO₂ contributing to global warming.
- * Soil degradation - Without tree roots to anchor the soil, deforestation often leads to inc. soil erosion.

Q2) What are the effects of excess usage of ground water.

Ans 1) Aquifer depletion -

- Over extraction of groundwater lowers the water table, making it more difficult and expensive to access groundwater.
- Excessive pumping, permanently reducing the aquifer's ability to store water.

2) Land Subsidence -

When large amounts of groundwater are withdrawn, the ground above the aquifer may start to sink or collapse, this is land subsidence. Which can cause damage to buildings, roads.

3) Reduced Water Quality - In coastal areas, excessive groundwater extraction can cause saltwater to infiltrate freshwater aquifers, leading to the salinization of drinking water supplies, making it unsuitable for agriculture.

4) Impact on surface water -

Excessive groundwater withdrawal can reduce the flow of rivers, lakes, during dry periods. This can harm aquatic ecosystems.

5) Ecosystem Disruption -

Lower groundwater levels can impact vegetation and wildlife that depend on consistent water supply.

6) Economic Consequences -

As groundwater becomes harder to access, costs of drilling deeper wells and pumping water increases.

Q3) Explain environmental impacts of minerals extraction and its remedial measures.

Ans^{Impacts} 1) Habitat destruction -

Mineral extraction requires clearing of large areas leading to the destruction of habitats for wildlife.

2) Water pollution -

When minerals containing sulfur are exposed to air and water during mining, they can produce sulfuric acid, which leaches into nearby water bodies.

3) Air pollution - Extraction and processing of minerals can generate larger amounts of dust and particulate matter, which degrade air quality.

4) Soil erosion & degradation -

Removal of vegetation and soil during mining operations can lead to increased soil erosion.

5) Landscape Alteration -

Underground mining causes damage to infrastructure.

Remedial Measures -

1) Environmental Impact Assessments (EIA's).

This includes identifying sensitive ecosystems, water sources and potential pollution pathways.

2) Sustainable Mining Practices -

Implement techniques that reduce footprints of mining.

3) Water management -

Install and maintain systems to treat mine wastewater.

4. Rehabilitation & Reclamation -

After mining activities are completed, restore the land by planting native vegetation and trees.

Part C) Q1) What are the benefits and environmental impacts of big dams? Explain with flow chart.

Ans Benefits -

- Dams provide a reliable source of water for agricultural irrigation, improving crop yields and enabling farming in arid regions.
- Dams harness energy of flowing water to regenerate electricity, providing a renewable source of energy that reduces reliance on fossil fuels.
- By controlling rivers flow, dams reduce the risk of downstream flooding during heavy rainfall.
- Reservoirs created by dams often recreational areas, provides opportunities for fishing, boating.
- Dams can stimulate local economies through creation of jobs.

Environmental Impacts -

- Dams flood large areas of land, destroying natural habitats & displacing wildlife.
 - Sediment that would naturally flow downstream is trapped by dams, which can reduce reservoir capacity and impact water quality.
 - Large dams require relocation of communities living in the floodplains.
- Dams obstruct fish migration routes,

- affecting spawning and fish populations.
- Organic matter in flooded areas decomposes anaerobically, producing methane, a potent greenhouse gas that contributes to climate change.

Big dams.

Benefits

- * Water supply
- * Hydropower generation
- * Irrigation & drinking water
- * Electricity Production
- * Recreation
- * Tourism and leisure

Environmental Impacts

- * Habitat loss.
- * Altered ecosystems
- * Water Quality Issues
- * Sedimentation
- * Temperature
- * Methane emissions.
- * Displacement of people
- * Seismic Risks

Q2) Explain environmental impacts related to food resources in India.

Ans ① Water Usage and Depletion-

Intensive irrigation, in regions like Punjab and Haryana, has led to the over extraction of groundwater, causing a decline in water tables and reducing water availability for other uses.

② Soil degradation =

Practices such as deforestation and improper land management can lead to soil erosion, reducing soil fertility and affecting crop yields.

can help prevent soil erosion, improve soil fertility, and enhance biodiversity.

④ Integrated Pest Management (IPM):

Utilizing natural predators and biological controls can reduce the need for chemical pesticides.

⑤ Waste Management]^x

⑥ Use of chemical Inputs-

The excessive use of chemical pesticides and fertilizers can lead to soil and water pollution, impacting biodiversity and the health of surrounding ecosystems.

⑦ Deforestation and Habitat loss-

The conversion of forests and other natural landscapes into agricultural land leads to habitat loss and reduced biodiversity.

⑧ Climate Change & Greenhouse Gas Emissions-

Livestock production, particularly cattle, contributes to methane emission, a potent greenhouse gas.

⑨ Land degradation-

In arid and semiarid regions, unsustainable agricultural practices can lead to desertification, where fertile land becomes barren, unproductive.

⑩ Waste Generation-

High levels of food waste at various stages of the food supply chain, from production to consumption, contribute to environmental degradation.

Q3) Explain Renewable and Non Renewable Resources.

Ans Renewable Resources -

Are natural resources that can be replenished naturally over a relatively short period of time.

Types -

① Solar Energy - Energy from Sun that can be captured using solar panels.

Benefits - • Abundant, reduces greenhouse gas emissions, can be used for electricity, heating and lighting.

② Wind Energy - Energy generated from wind using wind turbines.

• Clean, reduces reliance on fossil fuels, and has minimal environmental impact.

③ Hydropower - Energy derived from the flow of water, typically through dams in rivers.

• Provides a reliable energy source and can be adjusted to meet energy demands.

④ Biomass - Organic materials, such as plant and animal waste, used to produce energy.

• Reduces waste & can be used for heat, biofuels

⑤ Geothermal Energy - Energy from the heat stored beneath the Earth's Surface.

Consistent Energy source and has a low environmental footprint.

⑥ Tidal and wave Energy - Energy generated from the movement of tides, waves in the ocean.

• Predictable can provide a steady supply of energy.

Non-Renewable Resources -

All natural resources that cannot be replenished on a human timescale once they are depleted.

Types =

① Fossil fuels = Energy sources formed from the remains of ancient plants and animals over millions of years.

e.g. Coal, Oil, Natural Gas

② Nuclear fuels =

Fuels used in nuclear reactors to produce energy through nuclear fission.

e.g. Uranium, Plutonium.

③ Minerals and Metals = Natural substances found in the Earth's crust, used in various applications.

e.g. Iron Ore, Copper, Rare Earth Elements