

Q1. What is the scope of environmental sciences and how would environmental awareness help to protect our environment?

Ans:-

Environmental sciences are a multidisciplinary field that studies the interactions between humans and the natural world. It encompasses a range of disciplines, including ecology, geology, chemistry, biology, and environmental engineering. The scope of environmental sciences is vast, including topics such as pollution control, waste management, conservation, biodiversity, climate change, sustainable development, and environmental policy.

Environmental awareness is essential in protecting our environment as it helps people understand the impact of human activities on the environment. It promotes the need for sustainable development, the conservation of natural resources, and the protection of the earth's ecosystems. It encourages individuals, communities, and governments to adopt environmentally friendly practices and policies, which can help to reduce the impact of human activities on the environment.

Q2. Elaborate on the case study of Desertification in Hilly of the Himalayas.

Ans:-

Desertification is a process by which fertile land becomes barren and unproductive due to human activities and environmental factors such as climate change, deforestation, overgrazing, and soil erosion. The hilly areas of the Himalayas have been experiencing desertification due to deforestation, soil erosion, and overgrazing by livestock.

The cutting down of trees for firewood, construction, and agriculture has resulted in soil erosion, which has affected the fertility of the soil. The removal of trees has also led to a decrease in rainfall, as the trees play a crucial role in the water cycle.

Overgrazing by livestock has further degraded the soil, as the animals trample on the soil, reducing its ability to retain water and nutrients. The overgrazing has also resulted in the destruction of the natural vegetation cover, which has

affected the biodiversity of the region.

To combat desertification in the hilly areas of the Himalayas, measures such as afforestation, the implementation of sustainable grazing practices, and soil conservation techniques such as terracing and contour farming are essential.

Q3. Analyze the values of biodiversity.

Ans:-

Biodiversity refers to the variety of living organisms in an ecosystem, including plants, animals, and microorganisms. Biodiversity is important as it provides numerous ecological, economic, and cultural values.

Ecological values of biodiversity include the role of species in maintaining ecosystem services such as pollination, decomposition, nutrient cycling, and water purification. Biodiversity also plays a crucial role in regulating climate, protecting against natural disasters, and supporting food security.

Economic values of biodiversity include the provision of natural resources such as timber, medicines, and food. Biodiversity also contributes to the tourism industry, as people are attracted to places with high biodiversity, such as coral reefs, rainforests, and savannas.

Cultural values of biodiversity include the role of biodiversity in traditional knowledge systems, art, and cultural practices. Biodiversity is also important for spiritual and religious purposes, as many cultures believe that nature has intrinsic value and should be respected.

Q:-4

Ans:-

Ecological pyramids are graphical representations of the trophic structure and energy flow in an ecosystem. There are three types of ecological pyramids:

Pyramid of numbers: This type of pyramid represents the number of organisms at each trophic level in an ecosystem. It is a direct count of the number of individuals in each trophic level. The pyramid of numbers may be upright, inverted or spindle-

Inverted pyramids occur when the number of producers is less than the number of consumers.

Pyramid of biomass: This type of pyramid represents the total biomass at each trophic level in an ecosystem. Biomass is the total weight of all the living organisms in a given area. The pyramid of biomass is always upright, and it shows that the biomass decreases as we move up the trophic levels.

Pyramid of energy: This type of pyramid represents the flow of energy through each trophic level in an ecosystem. The pyramid of energy is always upright and represents the amount of energy available at each trophic level. It shows that the amount of energy available decreases as we move up the trophic levels.

The main characteristics of each of the ecological pyramids are:

Pyramid of numbers: In this type of pyramid, the number of individuals decreases as we move up the trophic levels. In some cases, an inverted pyramid of numbers may occur, indicating a high number of consumers and a low number of producers.

Pyramid of biomass: In this type of pyramid, the biomass decreases as we move up the trophic levels. This is because the energy is lost as heat during respiration and metabolism.

Pyramid of energy: In this type of pyramid, the energy available at each trophic level decreases as we move up the trophic levels. This is due to the second law of thermodynamics, which states that energy cannot be created or destroyed but can only be converted from one form to another, with some energy being lost as heat.

Q:-5

Ans:-

Conventional sources of energy refer to those sources that have been traditionally

used, such as coal, oil, and natural gas. On the other hand, non-conventional sources of energy are those sources that are relatively new, such as solar, wind, geothermal, and tidal power.

One of the biggest differences between conventional and non-conventional sources of energy is their environmental impact. Conventional sources of energy are known to release harmful greenhouse gases, pollutants, and other emissions, which contribute to climate change, air pollution, and other environmental problems. On the other hand, non-conventional sources of energy are generally considered to be more environmentally friendly as they produce little to no greenhouse gases or pollutants.

Another difference between conventional and non-conventional sources of energy is their availability and cost. Conventional sources of energy are generally more readily available and cheaper, as they have been used for a long time and are often subsidized by governments. Non-conventional sources of energy, on the other hand, are often more expensive to produce and require more investment in infrastructure and technology.

Overall, non-conventional sources of energy are seen as more environmentally friendly and sustainable in the long run, although there are still some challenges to their widespread adoption, such as cost and intermittency. As the world becomes more aware of the environmental impact of conventional sources of energy, there is growing interest and investment in non-conventional sources of energy as a way to mitigate climate change and reduce environmental damage.