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**ECOLOGY,
ENVIRONMENT
AND TOURISM**

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QUESTION PAPER

(June – 2019)

(Solved)

ECOLOGY, ENVIRONMENT AND TOURISM

Time: 3 Hours]

[Maximum Marks:100

Note: Attempt any five questions. All questions carry equal marks.

Q. 1. Define a Biotic community. Explain the various types of interactions among the members of a biotic community.

Ans. Ref.: See Chapter-1, Page No. 1, 'Introduction', Chapter-2, Page No. 12, 'The Linkages'.

Q. 2. Elaborate citing relevant examples the importance of environmental conservation for the growth and development of tourism.

Ans. Ref.: See Chapter-9, Page No. 38, Q. No.1 and Page No. 36, 'Conservation and Development'.

Q. 3. Discuss how various tourism activities contribute to environmental degradation and suggest possible ways to mitigate them.

Ans. Ref.: See Chapter-6, Page No. 30, Q. No. 3 Page No. 31, Q. No. 4.

Q. 4. Write short notes on the following:

(a) Photosynthesis

Ans. Ref.: See Chapter-1, Page No. 2, 'Light'.

(b) Food Chain and Food Web

Ans. Ref.: See Chapter-2, Page No. 9, 'Food Chain', Food Web and Trophic Level.

(c) Ozone Layer Depletion

Ans. Another important fast change in our atmosphere is the depletion of atmospheric Ozone layer. Stratospheric ozone layer (200-400 nm) absorbs the incoming UV radiation. But the Chlorofluorocarbons (used as refrigerants, air-conditioners, propellants), Halons, Carbon tetrachloride and Methyl chloroform released into the atmosphere (at 25 km) are broken down by UV and made to release chlorine which readily reacts with ozone and destroys it. A chain reaction can destroy 1,000,000 ozone molecules with a single chlorine atom. Consequently, the layer is getting thinner (hole in ozone layer over Antarctica)

exposing the organisms to the harmful UV radiation that can cause skin cancers.

Also Add: Ref.: See Chapter-1, Page No. 5, Q. No. 6.

(d) Green House Effect

Ans. Burning of fossil fuels and destruction of forests have resulted in an imbalance in CO₂ cycle. This results in retaining of the heat and rises the atmospheric temperature. This trapping of heat in the atmosphere is termed as 'Greenhouse effect'.

The 5 gases that contribute to greenhouse effect are:

Carbon dioxide	- 50%
CFCs	- 14%
Methane	- 18%
Ozone	- 12%
Nitrous oxide	- 6%

Q. 5. What do you understand by Responsible Tourism? Enumerate how government, industry and the local community can contribute to its development.

Ans. Ref.: See Chapter-10, Page No. 39, 'Responsible/ Alternative', Page No. 40, 'What is Attempted'.

Q. 6. Discuss the various environmental Issues involved in the development of coastal areas for tourism purpose.

Ans. Ref.: See Chapter-11, Page No. 47, 'Physical Development : Coastal Resorts'.

Q. 7. How has tourism been instrumental in the protection of the cultural and historical sites at destinations. .

Ans. Ref.: See Chapter-14, Page No. 57, 'Introduction', 'Culture', Page No. 58, Q. No. 2.

Q. 8. Define a wetland. Explain the impact of tourism on the functioning and conservation efforts of wetlands in India.

Ans. Ref.: See Chapter-28, Page No. 112, 'What Are Wetlands', Page No. 113, 'Excessive Tourism and Wetlands', 'Conservation of Wetlands'.

Q. 9. Discuss the various initiatives taken up by hotel industry to minimize wastage and environmental degradation.

Ans. Hotels and resorts play a significant role in the success of tourism industry. In India, hoteliering has been now given the status of Industry. They form 76.8 percent of the capital invested in tourism. Urban horizons are today dotted with rising structures of hotels. Resorts are coming up everywhere from the sea-side beaches to mountain tops on numerous hill stations.

Factors which are responsible for this surge in numbers of hotels and resorts are:

1. Increasing impetus to tourism.
2. Changing economic scenario of the country.
3. Emergence of neo-rich higher middle class.

4. Business travellers from foreign nations.

5. Realisation of the need to boost up accommodation sector for tourism development.

As a result there are now a large number of hotel chains in private and public sectors.

Also, Ref.: See Chapter-31, Page No. 131, Q. No. 3, Page No. 130, '2. Role of Hoteliers'.

Q. 10. What is the role and importance of tourism policies in the development of tourism? Discuss this in the context of Indian tourism industry.

Ans. Unregulated tourism growth is associated with adverse socio-economic and environmental impacts. On account of which tourism development cannot be left alone to market forces. And a carefully formulated tourism policy is, hence, important to balance tourism with the society.

Also Add: Ref.: See Chapter-18, Page No. 70, 'Fiscal and Economic Impacts', Page No. 71, 'Tourists Arrivals'.

■ ■

Sample Preview of The Chapter

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ECOLOGY, ENVIRONMENT AND TOURISM

ENVIRONMENT—AN INTRODUCTION

1

Our Environment

INTRODUCTION

This Chapter explains the fundamental difference between ecology, environment and ecosystem, describes the characteristics of environment and environmental factors, interdependence among living organisms in an environment, slow and fast changes in environment and the impact of anthropogenic activities on environment.

This introductory chapter provides a general framework for the study of the environment. It is therefore, important to first discuss some key concepts that include ecology, environment and ecosystem.

The **living** or **biotic** environment includes all the living organisms (plants, animals and micro-organisms) that interact with each other or with other species. Some species that are totally dependent on other species (host) for their food, water and other nutritional requirements are termed as parasites. *Cuscuta* commonly termed as dodder plant is a parasite. While some species live in a mutually beneficial manner with each other in a symbiotic relationship. Certain nitrogen-fixing bacteria and their legume hosts exhibit symbiosis.

The **non-living** or **abiotic** environment comprises of the physical and chemical components that influence the living organisms. These abiotic factors include light, soil, temperature, water and atmospheric gases.

An **ecosystem** is a natural unit consisting of all plants, animals and micro-organisms (biotic factors) in

an area functioning together with all of the non-living physical (abiotic) factors of the environment. An ecosystem can be a natural one like a forest, grassland, lake etc., or an artificial or man-made one like a farm or aquarium. Several broad regional types of ecosystems are termed as **biomes**.

CHAPTER AT A GLANCE

ABIOTIC ENVIRONMENT

The biotic environment lives within and depends on the abiotic environment. In order to understand the survival, distribution and adaptability of organisms in the different regions it is important to have knowledge of the abiotic components of the environment. Some of the abiotic environmental factors like climate, soil and topography of a region are responsible for a particular vegetation of that region. Therefore, the vegetation of Rajasthan differs considerably from that of Himachal Pradesh. Some of the important abiotic factors that are crucial for life include atmosphere, light, temperature, wind, humidity, water and soil.

Atmosphere

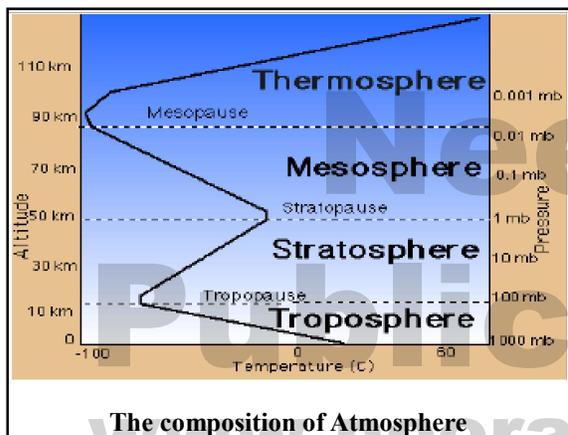
Atmosphere is a mixture of many gases and suspended particles. The gases in the lower atmosphere undergo continual mixing and, hence, the composition of atmosphere remains uniform everywhere upto an altitude of 80 km. These gases become stratified

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i.e., the heavier gases comprise the lower layers and lighter gases comprise the upper layers.

Table 1: The proportion of gases in the lower atmosphere (below 80 km)

Gas	Percentage by volume
Nitrogen	78.08
Oxygen	20.95
Argon	0.93
Carbon dioxide	0.03
Neon	0.0018
Helium, Methane, Krypton, Nitrous oxide, Hydrogen, Xenon, Ozone	> 0.0005



Light

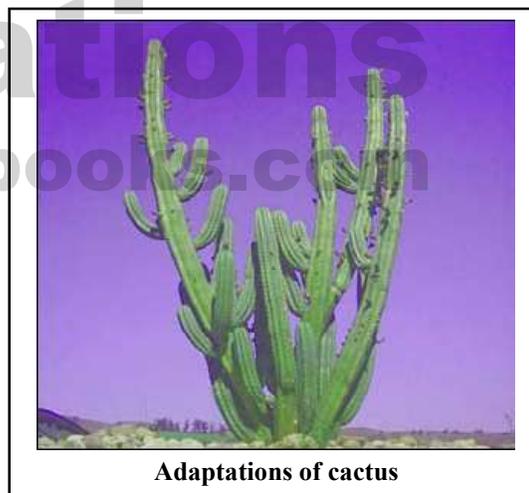
Solar radiation forms the major source of energy on earth. It is responsible for precipitation and blowing of winds on the surface of earth. Green plants utilise light as a source of energy along with carbon dioxide, water and a few minerals for manufacture of glucose through photosynthesis. Oxygen is liberated as a byproduct of the process.

Other physiological activities in plants that are controlled by light include transpiration, movement, flowering (photoperiodism) and germination. Even most of the animals are sensitive to light. The rhythm of functioning of a large number of animals is governed by light. Most of the insects, birds and animals are active during the day while certain insects (e.g., cockroaches and moths) and animals (bats) are active during night i.e., nocturnal.

Temperature

Living organisms are greatly influenced by temperature. Most of the organisms have a narrow temperature range for survival. The range of temperature in which an organism can survive is known as ‘**tolerance limit**’ in temperatures more or less than this range the functioning and survival becomes difficult. For any physiological activity, there is a **minimum, maximum and optimum temperature range**. The activity starts at the minimum temperature, while beyond the maximum no activity is possible and at the optimum temperature the activity is at its highest pace. Generally few organisms survive body temperatures above 45°C. Several organisms develop physiological and behavioural adaptations to withstand extremes of temperature. In desert areas the leaf, stem and other plant organs show morphological adaptations to avoid loss of water through evapotranspiration. Even animals reside in burrows to avoid the intense heat (e.g. kangaroo, rat) and are active at night. Most of the water lost through excretion and by evaporation from lungs is reabsorbed to minimise water loss from the body.

In case of extreme winters some species like polar bears enter physiologically dormant states termed as hibernation.



Wind

The strong moving current of air termed as wind greatly affects plants. Evapotranspiration is directly impacted by strong or slow wind. Wind also helps in seed and fruit dispersal. Higher wind velocities like those on high altitudes change the shape of tree canopy in the

direction of the wind. Also breakage of plant parts or uprooting of shallow trees is of common occurrence.

Humidity

The amount of water vapour or moisture present in the atmosphere is known as humidity. When atmosphere holds the maximum quantity of moisture at a fixed temperature and pressure then it is termed as absolute humidity.

Relative humidity (RH) is the ratio of actual amount of moisture present in the air to the amount required to saturate it at that temperature.

$$\text{RH \%} = \frac{\text{Amount of moisture present in air}}{\text{Amount of moisture required to saturate air}} \times 100$$

RH of a particular area is influenced by temperature, air pressure, wind velocity, vegetation and soil moisture. Relative humidity declines if atmosphere is warmer and increases in the cool conditions. Atmospheric humidity directly regulates the rate at which water evaporates from the body surface of living organisms through various physiological actions such as transpiration, perspiration etc. Plants growing in areas with high relative humidity are classified as hygrophytes (e.g. lichens).

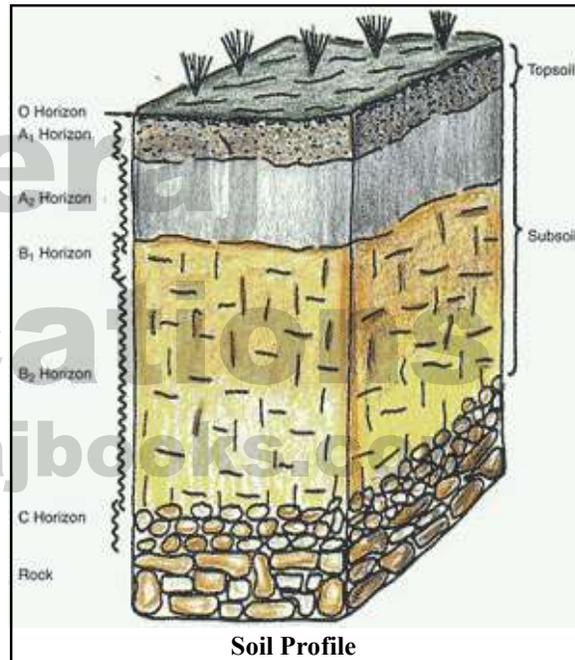
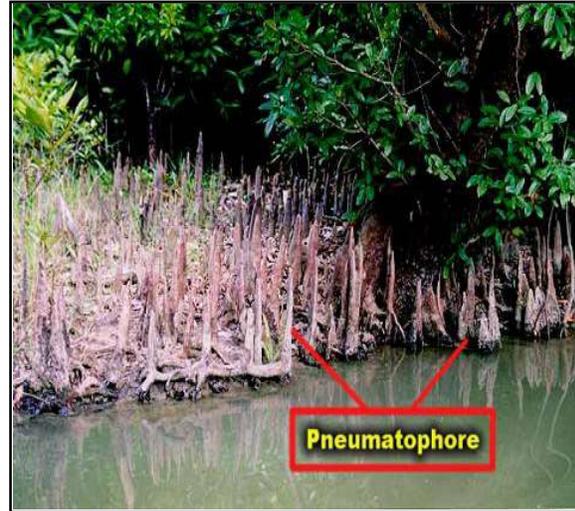
Water

Water is an essential requirement of life and forms the maximum percentage of cell contents in plants and animals. It is the basis of life, needed for domestic, irrigational and industrial purposes.

Water bodies like lake or pond have a large number of plants (hydrophytes) and animals that live in water. There are organisms that live both in water and land (amphibians, e.g. frog). Fish and other animals living in fast flowing waters have attaching devices and can thrive in fast currents. Animals that cannot swim actively live under stones, in crevices in the river bed, or within the sand in burrows like snails, clams and slugs.

Spongy outgrowths (pneumatophores) from roots of mangroves for gaseous exchange in saline environment. Mangroves exude excess salts from their leaves that precipitate on their surface.

Soil



Soil is the major source of mineral nutrients for plants and other organisms. The nutrient uptake from the soil is in soluble form. Soil fertility is determined by nutrient availability, the water holding capacity and aeration of the soil. Soil fertility influences plant productivity and the number of organisms the soil can support. Loam soil is the best for agriculture since it is a mixture of sand and clay particles that have a high water holding capacity and good aeration, so, penetration of plant roots is easy in loam.

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Environmental factors viz sunlight, temperature, rainfall, humidity, wind etc. function in close association with each other. Land surface and water bodies get heated by sunlight and re-radiation from the earth surface warms the atmosphere near the surface.

Most of the light falling on an area with vegetation is intercepted by plants and a very little reaches the ground surface. But in places devoid of vegetal cover, soil surface warms up quickly especially in case of stone, gravel, sand or bricks. Hence the microclimate of urban areas with concrete construction is warmer as compared to villages which are greener and with mud houses.

Similarly, there is a close relation between temperature and rainfall. High temperature leads to higher evaporation from water bodies and evapotranspiration from plants. The moist and warm air condenses in higher regions and turns into precipitation.

ENVIRONMENT CHANGES WITH TIME

Slow Changes

Slow changes are continuous gradual changes that take place in environment and are studied through fossil records. These are at scale of million of years and hence not seen in a lifetime or even over a period of 100-200 years.

The earth melted within 800 million years of its formation. Iron and heavy metals sank towards centre and lighter metals were expelled as gases to form the atmosphere. Upon cooling outer surface of earth solidified into a crust. Falling meteorites punctured the surface and heated it up. Earth became geologically active and volcanoes released huge quantities of lava ash composed of gases (CO₂, N₂, water vapour). Cooling of water vapour formed clouds and rains lead to formation of oceans, rivers etc. Thunders-torms accompanying rains played an important role in conversion of elements into complex molecules which form the building blocks of life. With time earth's crust became thicker and sunlight caused uneven heating of the surface and change in temperature caused flow of gases and water in atmosphere. Lightning discharges in atmosphere forged molecules of carbon, hydrogen and nitrogen which accumulated into the ocean to form the first living organism. Soon a new organism originated that contained compound chlorophyll capable of trapping solar energy and using CO₂ and water of the sea to form carbohydrates liberating free oxygen as a by product. As O₂ started accumulating in the

atmosphere, CO₂ started decreasing. This new combination of gases lead to the evolution of new organisms which had the ability to use O₂ to drive life processes more efficiently.

Addition of O₂ in atmosphere made another change when some of the O₂ was converted into ozone. Around 600 years ago, through slow changes our atmosphere reached the present state, most comfortable for life. But anthropogenic activities are rapidly causing a change in this state.

Changes in Land-mass or Continental Movement

Alfred Wegener proposed that about 200 million years ago there was a single continent called 'Pangaea'. On account of continental drifting, about 15 cm every year, Indian plates drifted from 'Gondwana Land' and met 'Laurasia' to give present shape to this continent. Himalayas were formed because of the impact of the union of these two masses.

The core of earth is composed of a dense hot molten mass of metal surrounded by a hot pliable layer of rock. Convection currents circulating in this region are responsible for volcanic eruptions, earthquakes etc.

Fast Changes

In contrast to slow changes that take place over geological time scales certain anthropogenic activities have brought about fast changes in the environment and our climate.

Since the industrial revolution anthropogenic activities such as burning coal, oil and other fossil fuels, large scale deforestation and mining etc. have lead to widespread air, water and soil pollution. Transportation (42%), fossil fuel burning (21%), industrial emissions (14%), solid waste disposal (5%) and other activities (18%) are significant contributors to pollution.

Greenhouse Effect and the Changing Atmosphere

Burning of fossil fuels and destruction of forests have resulted in an imbalance in CO₂ cycle. This results in retaining of the heat and raises the atmospheric temperature. This trapping of heat in the atmosphere is termed as 'greenhouse effect'.

The 5 gases that contribute to greenhouse effect are:

Carbon dioxide	– 50%
CFCs	– 14%