



Topic of Home Assignment

**Ecosystems, Natural Resources: Renewable and Non-Renewable
Resources**



Report submitted to
Mayang Anchalik College
Rajamayang, Morigaon, Assam

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Certificate

This is to certify that the report of the Home Assignment given instead of Field Work Due to the unfavourable environment of Covid-19 on the prescribed syllabus pertaining to "Ecosystems, Natural Resources: Renewable and Non-Renewable Resources" is a bonafied record of independent work by Abhijit Sarkar under my supervision during academic year 2020-21, submitted to Mayang Anchalik College. The report of the Home Assignment has not been previously formed by any student.


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1.(a) What are the main components of environment?

Ans: → The main components of the environment are atmosphere or the air, lithosphere or the rocks and soil, hydrosphere or the water, and the living component of the environment or the biosphere. the thick gaseous layer surrounding the earth.

⑥ Why Environmental Science is multidisciplinary in nature?

Ans: → The Environment studies is a multi-disciplinary science because it comprises various branches of studies like chemistry, physics, medical science, life science, agriculture, public health, sanitary engineering etc. It is the science of physical phenomena in the environment.

⑦ What is meant by the "zero waste concept"?

Ans: → Zero waste: The conservation of all resources by means of responsible production, consumption, reuse and recovery of all products, packaging, and materials, without burning them, and without discharges to land, water or air that threaten the environment or human health.

⑧ What is meant by rescue and reduce?

Ans: → The meant by rescue and reduce -

① rescue → Environmental data rescue is a collection of processes. including photograph and scanning, that stores historical and modern environmental data in a usable format. Rescue comprises responsive operations that usually involve the saving of life.

② reduce → Reducing is simply creating less waste. It's the best method for keeping the environment clean.

⑥ What do you mean by ecosystem?

Ans: → The simplest definition of an ecosystem is that it is a community or group of living organisms that live in and interact with each other in a specific environment.

For instance, tropical forests are ecosystems made up of living beings such as trees, plants, animals, insects and micro-organisms that are in constant interaction between themselves and that are affected by other physical (sun, temperature) or chemical (oxygen or nutrients) components.

⑦ Define Producers, Consumers and decomposers.

Ans: → Producers -

Producers are organisms that produce food for themselves and other organisms. They use energy and simple inorganic molecules to make organic compounds. The stability of producers is vital to ecosystems because all organisms need organic molecules. Producers are also called autotrophs. There are two basic types of autotrophs: photoautotrophs and chemoautotrophs.

Consumers

Consumers are organisms that depend on other organisms for food. They take in organic molecules by essentially "eating" other living things. They include all animals and fungi (fungi don't really "eat" they absorb nutrients from other organisms). They also include many bacteria and even a few plants, such as the pitcher plant shown in Figure below. Consumers are also called heterotrophs. Heterotrophs are classified by what they eat:

Decomposers

When organisms die, they leave behind energy and matter in their remains. Decomposers break down the remains and other wastes and release simple inorganic molecules back to the environment. Producers can then use the molecules to make new organic compounds. The stability of decomposers is essential to every ecosystem. Decomposers are classified by the type of organic matter they break down:

(g) What are the primary and secondary productivity?

Ans: Primary productivity: The rate at which autotrophic organisms produce organic compounds in an ecosystem is known as primary productivity. It can be of two types:

Secondary productivity: It refers to the rate of biomass formed by the heterotrophs such as grazers and decomposers.

(h) What are the abiotic components in an ecosystem?

Ans: Biotic describes a living component of an ecosystem; for example organisms, such as plants and animals. Examples water, light, wind, soil, humidity, minerals, gases. All living things — autotrophs and heterotrophs — plants, animals, fungi, bacteria.

(i) What do you mean by "food web" and "food chain"?

Ans: Food web is an important conceptual tool for illustrating the feeding relationships among species within a community, revealing species interactions and community structure, and understanding the dynamics of energy transfer in an ecosystem.

Food chain, in ecology, the sequence of transfers of matter and energy in the form of food from organism to organism.

(j) What is energy flow in an ecosystem?

Ans: → Energy flow is the flow of energy through living things within an ecosystem. All living organisms can be organized into producers and consumers, and those producers and consumers can further be organized into a food chain. Each of the levels within the food chain is a trophic level. In order to more efficiently show the quantity of organisms at each trophic level, these food chains are then organized into trophic pyramids. The arrows in the food chain show that the energy flow is unidirectional, the head of the arrows show the direction energy is moving in, and that energy is lost as heat at each step along the way.

2. (a) Importance of the Environmental studies.

Ans: → (i) To Realize That Environmental problems are Global
Environmental science lets you recognize that environmental problems such as climate change, global warming, ozone layer depletion, acid rains, and impacts on biodiversity and ~~ma~~ marine life are not just national problems, but global problems as well. So, concerted effort from across the world is needed to tackle these problems.

(ii) To understand the Impacts of Development on the Environment
It's well documented and quantified that development results in industrial growth, urbanization, expansion of telecommunication and transport systems, hi-tech agriculture, and expansion of housing.

Environmental science seeks to teach the general population about the need for decentralization of industries to reduce congestion in urban areas. Decentralization means many people will move out of ~~at~~ urban centers to reduce pollution resulting from overpopulation.

The goal is to achieve all this sustainably without compromising the future generation's ability to satisfy own needs.

③ To Discover Sustainable ways of Living

Environmental science is more concerned with discovering ways to live more sustainably. This means utilizing present resources in a manner that conserves their supplies for future.

Environmental sustainability doesn't have to outlaw living luxuriously, but it advocates for creating awareness about the consumption of resources and minimizing unnecessary waste.

This includes minimizing household energy consumption, using disposals to dispose of waste, eating locally, recycling more, growing your own food, drinking from the tap, conserving household water, and driving your car less.

④ To Utilize Natural Resources Efficiently

Natural resources bring a whole lot of benefits to a country. A country's natural resources may not be utilized efficiently because of low-level training and a lack of management skills. Environmental science teaches us to use natural resources efficiently by:

⑤ To shed Light on contemporary concepts such as How to conserve Biodiversity

Biodiversity is the variety of life on earth. The present rate of biodiversity loss is at an all-time high. Environmental science aims to teach people how to reverse this trend by:

- 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

⑥ Multidisciplinary nature of the Environmental Science.

Ans: → Environmental studies is essential as it helps us to understand our surrounding environment and natural phenomena. Numerous points provide us the importance of the multidisciplinary nature of Environmental Studies. They are:

- It helps in gaining knowledge about the current environmental issues. It provides us with the necessary skills to obtain solutions for various environmental issues such as pollution, global warming and climate change.

- It helps in maintaining the ecological balance through fundamental knowledge of environmental systems and processes.

- It provides us information about the changes in the environment due to anthropogenic factors. It also provides us the skills for analyzing different environmental systems and changes in the environment because of human activities.

- It aims to preserve and protect biodiversity. It makes us familiar with the various species of flora and fauna. It provides us with different ways to preserve and protect them.

- It provides us the consciousness about our duties towards the environment. It additionally educates us about the various environmental issues which need to be resolved at a faster pace.

Environmental issues such as conservation of energy, toxic emissions, water conservation, proper disposal of wastes, rising global temperature, and many more are also explained to us by environmental studies.

- Various more issues such as the depletion of natural resources, growing human population, rising numbers of natural calamities, for instance, earthquakes, tsunamis, floods, drought, are all serious concerns that need to be taken seriously. EVS makes us understand the harmful and drastic effects of these issues on the environment, and humans as well.

• By studying Environmental studies, people can explore and connect with their natural and surrounding environment. It helps people in developing their insights for understanding human processes, natural phenomena, and various changes in the environment.

3. (a) Discuss the need for public awareness in environmental science.

Ans: → NEED FOR PUBLIC AWARENESS:

Increasing population, Urbanization and poverty have generated pressure on the natural resources and lead to a degradation of the environment. TO PREVENT THE ENVIRONMENT FROM FURTHER DEGRADATION, the Supreme court has ordered and initiated environmental protection awareness through government and non-government agencies to take part in protecting our environment. Environmental pollution cannot be prevented by laws alone. Public participation is equally important with regard to environmental protection.

Environmental Education (EE) is a process of learning by giving an overall perspective of knowledge and awareness of the environment. It sensitizes the society about environmental issues and challenges interested individuals to develop skills and expertise thereby providing appropriate solutions.

Climate change, loss of biodiversity, declining fisheries, ozone layer depletion, illegal trade of endangered species, destruction of habitats, land degradation, depleting ground water supplies, introduction of alien and sewage disposal pose a serious threat to ecosystems in forest, rural, urban and marine ecosystems.

Both formal and informal education on the environment will give the interested individual the knowledge, values, skills and tools needed to face the environmental challenges on a local and global level.

C. Explain the Structure and Functions of ecosystem

Ans $\rightarrow$ Structure of Ecosystem:

The structure of an ecosystem is basically a description of the organisms and physical factors of environment including the amount and distribution of nutrients in particular including habitat. It also provides information regarding the range of climatic conditions prevailing in the area.

From the structure point of view, all ecosystems consist of the following basic components:

1. Abiotic Components
2. Biotic Components.

1. Abiotic Components $\rightarrow$

Ecological relationships are manifested in physicochemical environment. Abiotic component of ecosystem includes basic inorganic elements and compounds, such as soil, water, oxygen, calcium carbonates, phosphates and a variety of organic compounds (by-products of organic activities or death).

It also includes such physical factors and ingredients as moisture, with currents and solar radiation. Radiant energy of sun is the only significant energy source for any ecosystem. The amount of non-living components, such as carbon, phosphorus, nitrogen, etc., that are present.

2. Biotic Components :

The biotic components include all living organisms present in the environmental system...

Function of Ecosystem :

An ecosystem is a discrete structural, functional and like sustaining environmental system. The environmental system consists of ecosystem includes the living organisms; plants, animals and microbes whereas the abiotic component includes inorganic matter and energy.

Abiotic components provide the material for the synthesis and perpetuation of organic components (protoplasm). The synthesis and perpetuation process involve energy exchange and this energy comes from the sun in the form of solar energy.

Thus, in any ecosystem we have the following functional components:

(i) Inorganic constituents (air, water mineral salts)

(ii) organisms (plants, animals and microbes), and.

(iii) Energy input which which from outside (the sun).

These three interact and form an environmental system. Inorganic constituents and are

Synthesized into organic structures by the green plants (primary producers) through photosynthesis and the solar energy is utilized in the process. Green plants become the source of energy for renewals (herbivores) which, in turn become source of energy for the flesh eating animals (carnivores). Animals of all types grow and add organic matter to their body weight and their source of energy is complex organic compound taken as food.

They are known as secondary producers in an ecosystem have a definite life span after which they die. The dead organic remains of plants and animals provide food for saprophytic microbes, such as bacteria, fungi and many other animals. The saprobes ultimately decompose the organic structure and break the complex molecules and liberate the inorganic components into their environment.

These organisms are known as decomposers. During the process of decomposition of organic molecules, the energy which kept the inorganic components bound together in the form of organic molecules gets liberated and dissipated into the environment as heat energy. Thus in an ecosystem energy from the sun, the input is fixed by plants and transferred to animal components.

Nutrients are withdrawn from the substrate, deposited in the tissues of the plants and animals, cycled from one feeding group to another, released by decomposition to the soil, water and air and then recycled. The ecosystems operating in different habitats, such as deserts, forests, grasslands and seas are interdependent on one another. The energy and nutrients of one ecosystem may find their way into another so that ultimately all parts of the earth are interrelated, each comprising a part of the total system that keeps the biosphere functioning.