



## **JG COLLEGE OF COMMERCE**

B.COM. FIRST YEAR SEM-2

### **FOUNDATION COURSE ENVIRONMENTAL STUDIES**

#### **SYLLABUS**

**Note: Syllabus is designed as suggested by UGC**

#### **INTRODUCTION & SUMMARY OF COURSE: -**

Environmental studies are a multidisciplinary academic field which systematically studies human interaction with the environment. Environmental studies connect principles from the physical sciences, commerce/economics, the humanities, and social sciences to address complex contemporary environmental issues.

#### **Unit I: Multidisciplinary nature of environmental studies**

- Definition,
- scope and importance,
- Need for public awareness.

#### **Unit II: Ecosystems**

- Concept of an ecosystem.
- Structure and function of an ecosystem.
- Producers, consumers and decomposers.
- Energy flow in the ecosystem.
- Ecological succession.

#### **Unit III: Social Issues and the Environment**

- From Unsustainable to Sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns.

- Case Studies
- Environmental ethics: Issues and possible solutions.

#### **Unit IV: Human Population and the Environment**

- Population growth, variation among nations.
- Population explosion – Family Welfare Program
- Environment and human health.

#### **SOME IMPORTANT LONG QUESTIONS: -**

##### **Q.1 Define Environmental studies. Explain the Scope and Importance of Environmental studies.**

**Ans.**

Environmental studies deals with every issue that affects an organism. It is essentially a multidisciplinary approach that brings about an appreciation of our natural world and human impacts on its integrity. It is an applied science as it seeks practical answers to making human civilization sustainable on the earth's finite re-sources.

Its components include biology, geology, chemistry, physics, engineering, sociology, health, anthropology, economics, statistics, computers and philosophy.

##### **Scope:**

We see that our surroundings were originally a natural landscape such as a forest, a river, a mountain, a desert, or a combination of these elements.

Most of us live in landscapes that have been heavily modified by human beings, in villages, towns or cities. But even those of us who live in cities get our food supply from surrounding villages and these in turn are dependent on natural landscapes such as forests, grasslands, rivers, seashores, for resources such as water for agriculture, fuel wood, fodder, and fish. Thus our daily lives are linked with our surroundings and inevitably affects them.

Over the past 200 years however, modern societies began to believe that easy answers to the question of producing more resources could be provided by means of technological innovations.

For example, though growing more food by using fertilizers and pesticides, developing better strains of domestic animals and crops, irrigating farmland

through mega dams and developing industry, led to rapid economic growth, the ill effects of this type of development, led to environmental degradation.

The industrial development and intensive agriculture that provides the goods for our increasingly consumer-oriented society uses up large amounts of natural resources such as water, minerals, petroleum products, wood, etc. Non-renewable resources, such as minerals and oil are those which will be exhausted in the future if we continue to extract these without a thought for subsequent generations. Renew-able resources, such as timber and water, are those which can be used but can be regenerated by natural processes such as regrowth or rainfall.

**Importance:**

- Understand all the different aspects: To understand all the different aspects of our environment we need to understand biology, chemistry, physics, geography, resource management, economics and population issues.
- Productive value of nature: As scientists make new advances in fields such as biotechnology, we begin to understand that the world's species contain an incredible and uncountable number of complex chemicals.
- Aesthetic/Recreational value of nature: The aesthetic and recreational values that nature possesses enlivens our existence on earth. This is created by developing National Parks and Wildlife Sanctuaries in relatively undisturbed areas. In an urban setting, green spaces and gardens are vital to the psychological and physical health of city dwellers.
- The option values of nature: While we utilise several goods and services of nature and enjoy its benefits, we must recognize that every activity that we do in our daily lives has an adverse impact on nature's integrity. Our present generation has developed its economies and lifestyles on unsustainable patterns of life. However, nature provides us with various options on how we utilize its goods and services. The option value allows us to use its resources sustainably and preserve its goods and services for the future.

**Q.2 Explain Concept of an ecosystem. Describe Structure and function of an ecosystem in detail.**

**Ans.**

An 'Ecosystem' is a region with a specific and recognizable landscape form such as forest, grassland, desert, wetland or coastal area. The nature of the ecosystem is

based on its geo-graphical features such as hills, mountains, plains, rivers, lakes, coastal areas or islands. It is also controlled by climatic conditions such as the amount of sunlight, the temperature and the rainfall in the region. The geographical, climatic and soil characteristics form its non-living (abiotic) component. These features create conditions that support a community of plants and animals that evolution has produced to live in these specific conditions. The living part of the ecosystem is referred to as its biotic component.

Ecosystems are divided into following.

- 1) Terrestrial or land-based ecosystems
- 2) Aquatic ecosystems in water

### **Structure of an ecosystem:**

Components that make up the structural aspects of an ecosystem include:

- 1) Inorganic aspects – C, N, CO<sub>2</sub>, H<sub>2</sub>O.
- 2) Organic compounds – Protein, Carbohydrates, and Lipids – link abiotic to biotic aspects.
- 3) Climatic regimes – Temperature, Moisture, Light & Topography.
- 4) Producers – Plants.
- 5) Macro consumers – Phagotrophs – Large animals.
- 6) Micro consumers – Saprotrophs, absorbers – fungi.

### **Functions of Ecosystem**

#### **1) Energy cycles:**

All the functions of the ecosystem are in some way related to the growth and regeneration of its plant and animal species. These linked processes can be depicted as the various cycles. These processes depend on energy from sunlight. During photosynthesis carbon dioxide is taken up by plants and oxygen is released. Animals depend on this oxygen for their respiration. The water cycle depends on the rainfall, which is necessary for plants and animals to live. The energy cycle recycles nutrients into the soil on which plant life grows. Our own lives are closely linked to the proper functioning of these cycles of life.

#### **2) Food chains:**

The most obvious aspect of nature is that energy must pass from one living organism to another. When herbivorous animals feed on plants, energy is transferred from plants to animals. In an ecosystem, some of the animals feed on other living organisms, while some feed on dead organic matter. The latter form the 'detritus' food chain. At each linkage in the chain, a major part of the energy from the food is lost for daily activities.

### **3) Diversity-interlinkages between organisms:**

Biological diversity includes all plants, animals, microorganisms, the ecosystems of which they are part, and the diversity within species, between species, and of ecosystems

### **4) Nutrient cycles-biogeochemical cycles:**

Biogeochemical cycles mainly refer to the movement of nutrients and other elements between biotic and abiotic factors. The earth obtains energy from the sun which is radiated back as heat, rest all other elements are present in a closed system. The major elements include:

- Carbon
- Hydrogen
- Nitrogen
- Oxygen
- Phosphorus
- Sulphur

These elements are recycled through the biotic and abiotic components of the ecosystem. The atmosphere, hydrosphere and lithosphere are the abiotic components of the ecosystem.

### **5) Evolution:**

If organisms collectively have a significant impact on their environment, to ignore the organism–environment feedback may lead to serious flaws in predictions of the qualitative direction of evolution and expected species' traits in ecological systems. We focus on the evolution of plant defense against herbivores as an example, assuming for the time being that herbivores only consume plants and do not provide them with any indirect benefits.

**Q.3 Give a short note on Water conservation, rain water harvesting and watershed management.**

**Ans.**

**1) Water conservation:**

Conserving water has become a prime environmental concern. Clean water is becoming increasingly scarce globally. With deforestation surface runoff increases and the sub soil water table drops as water has no time to seep slowly into the ground once vegetation is cleared.

When we waste water, we do not realise that it is affecting the lives of all of us in so many different ways. Water has to be equitably and fairly distributed so that household use, agriculture and industry all get a share of the water. It's over use and misuse due to various activities that waste water or cause pollution has led to a serious shortage of potable drinking water. Thus water conservation is linked closely with overall human well-being.

Traditional systems of collecting water and using it optimally have been used in India for many generations. These have been forgotten in the recent past. Conserving water in multiple small percolation tanks and 'jheels' was important in traditional forms of agriculture. Villages all over the country had one or more common 'talabs' or tanks from which people collected or used water carefully.

**2) Rain water Harvesting:**

Current technologies of rainwater harvesting require that all roof and terrace water pass down into a covered tank where it can be stored for use after the monsoon. This is most advantageous in arid areas where clean water is very scarce. However, there are practical difficulties such as constructing large storage tanks which are expensive.

Another way of using rooftop rainwater harvesting is to collect it so that it percolates into the ground to recharge wells instead of flowing over the ground into rivers. Thus, by recharging ground water harvested from rooftops, the water table rises and the surrounding wells retain water throughout the year.

**3) Watershed Management:**

The management of a single unit of land with its water drainage system is called watershed management. It is a technique that has several components. This includes soil and water management and developing vegetative cover. The natural

drainage pattern of a watershed unit if managed appropriately can bring about local prosperity by a year round abundance of water that improves the quality of human life in the area.

Watershed management begins by taking control over a degraded site through local participation. People must appreciate the need to improve the availability of water both in quantity and quality for their own area. Once this is adequately demonstrated, the community begins to understand the project, people begin to work together in the activities that lead to good watershed management.

**Q.4 what is Environmental ethics? Brief about the issues and their possible solution concerned with environmental ethics.**

**Ans.**

Environmental ethics deals with issues related to the rights of individuals that are fundamental to life and well-being. This concerns not only the needs of each person today, but also those who will come after us. It also deals with the rights of other living creatures that inhabit our earth.

There are set of 8 propositions which are of great relevance to the **ethical issues** that are related to environmental concerns. These includes:

- 1) Environmental destruction is largely caused by the consumption of the rich.
- 2) The worst sufferers of environmental destruction are the poor.
- 3) Even where nature is being 'recreated', as in afforestation, it is being transformed away from the needs of the poor and towards those of the rich.
- 4) Even among the poor, the worst sufferers are the marginalised cultures and occupations, and most of all, women.
- 5) There cannot be proper economic and social development without a holistic understanding of society and nature.
- 6) If we care for the poor, we cannot allow the Gross Nature Product to be destroyed any further. Conserving and recreating nature has become our highest priority.
- 7) Gross Nature Product will be enhanced only if we can arrest and reverse the growing alienation between the people and the common property resources. In this we will have to learn a lot from our traditional cultures.

8) It is totally inadequate to talk only of sustainable rural development, as the World Conservation Strategy does. We cannot save the rural environment or rural people dependent on it, unless we can bring about sustainable urban development.

**Solutions related to ethical issues:**

- Need for Gender Equity
- Urban – rural equity
- Preserving resources for future generations
- The rights of animals
- Environment education and awareness

**Q.5 Give a note on population growth. How it varies among nations?**

**Ans.**

Our global human population, 6 billion at present, will cross the 7 billion mark by 2015. The needs of this huge number of human beings cannot be supported by the Earth's natural resources, without degrading the quality of human life.

In the near future, fossil fuel from oil fields will run dry. It will be impossible to meet the demands for food from existing agro systems. Pastures will be overgrazed by domestic animals and industrial growth will create ever-greater Problems due to pollution of soil, water and air. Seas will not have enough fish. Larger ozone holes will develop due to the discharge of industrial chemicals into the atmosphere, which will affect human health.

Global warming due to industrial gases will lead to a rise in sea levels and flood all low-lying areas, submerging coastal agriculture as well as towns and cities. Water 'famines' due to the depletion of fresh water, will create unrest and eventually make countries go to war. The control over regional bio-logical diversity, which is vital for producing new medicinal and industrial products, will lead to grave economic conflicts between biotechnologically advanced nations and the bio-rich countries. Degradation of ecosystems will lead to extinction of thousands of species, destabilizing natural ecosystems of great value.

These are only some of the environmental problems related to an increasing human population and more intensive use of resources that we are likely to face in future. These effects can be averted by creating a mass environmental awareness movement that will bring about a change in people's way of life.

Only 15% of the world's population in the developed world is earning 79% of income! Thus the disparity in the extent of per capita resources that are used by people who live in a 'developed' country as against those who live in a 'developing'

country is extremely large. Similarly, the disparity between the rich and the poor in India is also growing.

The increasing pressures on resources place great demands on the in-built buffering action of nature that has a certain ability to maintain a balance in our environment. However, current development strategies that essentially lead to short-term gains have led to a breakdown of our Earth's ability to replenish the resources on which we depend.

### MCQS:-

**1) Environmental studies is defined as the branch that deals with the:**

- (a) Design, study, and discovery of new materials.
- (b) The study of humanities, social, biological, and physical sciences.
- (c) Incorporate the information and physical sciences.
- (d) Approach about the natural world and the impact of humans on its integrity.

**2) Which element is considered the largest source of world's commercial energy consumption?**

- (a) Coal
- (b) Oil
- (c) Natural gas
- (d) Nuclear

**3) \_\_\_\_\_ is not constituted in ecosystem.**

- (a) cloths
- (b) Soil
- (c) Air
- (d) Water

**4) \_\_\_\_\_ are a group of organisms consisting of small animals like worms, insects, bacteria and fungi.**

- (a) Carnivores
- (b) Herbivores
- (c) Gramnivores
- (d) Detrivores

**5) An ecosystem when there are very large number of interlinked chains called \_\_\_\_\_.**

(a) Food Web

(b) Food clock

(c) Food fire

(d) Food Pyramid

6) Scientific research, bird-watching, ecotourism etc are part of \_\_\_\_\_ value.

(a) Non-consumptive use value

(b) Consumptive use value

(c) Productive use value

(d) Option value

7) Which amongst the following is considered as terrestrial ecosystem?

(a) Wetland

(b) Delta

(c) Marine

(d) Grassland

8) \_\_\_\_\_ can be catered as indirect use of product.

(a) Medicine

(b) Fruits

(c) Drugs and chemicals

(d) Roots

9) \_\_\_\_\_ is a wide range of landscapes in which the vegetation is mainly formed by grasses and small annual plants are adapted to India's various climatic conditions.

(a) Dessert Ecosystem

(b) Grassland Ecosystem

(c) Aquatic Ecosystem

(d) Marine Ecosystem

10) The term ecosystem was coined by \_\_\_\_\_

(a) Warming

(b) Tansle

(c) Odum

(d) Haeckel

11) The breakdown of detritus into small particles by earthworm is a process called\_\_\_\_\_

- (a) Catabolism
- (b) Mineralization
- (c) Humification
- (d) Fragmentation

12) If we combine all the ecosystems present on earth, then it is called

- (a) Biome
- (b) Habitat
- (c) Biosphere
- (d) Ecology

13) All the energy in a food chain originates from\_\_\_\_\_

- (a) Plants
- (b) Sun
- (c) Sea
- (d) All of the above

14) What are the two main types of drip irrigation?

- (a) Surface and Subsurface drip irrigation
- (b) Under and Subsurface drip irrigation
- (c) Top and Surface drip irrigation
- (d) Top and under drip irrigation

15) Which one of the following is the benefit of rainwater harvesting?

- (a) Flood mitigation
- (b) Provide a lot of water to play
- (c) Create good aesthetic view
- (d) Decrease the ground water level

16) What is the name of the process to clean water using filters?

- (a) Sublimation
- (b) Oxidation
- (c) Rain water harvesting
- (d) Purification

17) Which one of the following is the major environmental issues?

- (a) Employment

(b) Use of resource

(c) Use of economy

(d) Education

**18) Which movement could be construed as the foundation of feminist political ecology in India?**

(a) Swadeshi movement

(b) Satyagrah movement

(c) Independence movement

(d) Chipko movement

**19) Which type of farming is sustainable?**

(a) Plantation

(b) Shifting cultivation

(c) Nomadic Grazing

(d) Cattle ranching

**20) Eco-tourism should lead**

(a) Environmental tourism

(b) Sustainability

(c) Sustainable Tourism

(d) Sustainable use of resource

**21) Which one of the following is a result of overpopulation?**

(a) Adequate storage of natural resources

(b) Pressure on land and other renewable resources

(c) Increasing the amount of forest

(d) Decrease the shortage of water

**22) What is the reason for poor standard of living and malnutrition in India?**

(a) Due to overpopulation

(b) Due to environmental condition

(c) Due to absence of natural resources

(d) Due to poor economy of India

**(23) What is India's global rank in population?**

(a) First

(b) Second

(c) Third

(d) Fourth

**(24) \_\_\_\_\_ is considered as infectious disease.**

**(a) Tuberculosis**

(b) Malaria

(c) Diarrhea

(d) None of the above

**25) Child neglect consists of:**

(a) Failure to provide for the child's basic physical needs; food, shelter clothing

**(b) Failure to provide proper medical care for the child, including immunizations**

(c) Failure to provide appropriate supervision

(d) All of the above

**26) Which of the following structures are involved in the delivery of child welfare services?**

(a) The children's bureau

(b) Title IVB of the Social Security Act

(c) State child welfare departments

**(d) All of the above**

**27) Which one of the following is the main target of family welfare programs?**

(a) Children below 12 years

**(b) Couple in a fertile age**

(c) Women after fertile age

(d) Man after fertile age

**28) Which organization works as an administrative unit for implementation of Family Welfare Program in all districts of the State and functioning at State Head quarter?**

(a) The District Family Welfare Bureau

(b) The National Family Welfare Bureau

(c) the State Family Welfare Bureau

(d) The International Family Welfare Bureau

**29) Which one of the following cause harm to human health?**

(a) Organic farming

(b) Using of pesticides

(c) Using solar vehicles

(d) Protecting forests

**30) Which one of the following can cause breast cancer in women?**

(a) Breast feeding

(b) Being physically fit

(c) Using Antiperspirant

(d) Eating healthy food

