GOVERNMENT POLYTECHNIC, BHADRAK

Environmental Studies (Th-05)

(As per the 2019-20 syllabus of the SCTE&VT, Bhubaneswar, Odisha)

Third Semester

Common for all branch

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Environmental Studies

TOPIC WISE DISTRIBUTION OF PERIODS

Sl. no	Name of the topic	No of periods as per syllabus	No. of period actually needed	Expected Marks	
01	The Multidisciplinary nature of Environmental Studies	04	05	07	03
02	Natural Resources	10	11	06	04
03	Systems	08	09	07	08
04	Biodiversity and it's Conservation	08	09		15
05	Environmental Pollution.	12	13		15
06	Social issues and the Environment	10	11		15
07	Human population and the environment	08	09		20
	Total	60	67	20	80

UNIT-1

THE MULTIDISCIPLINARY NATURE OF NVIRONMENTAL STUDIES:

Learning objectives

Definition, scope and importance, Need for public awareness.

DEFINITION:

ENVIRONMENT-

The surrounding in which a person or plant

lives. [OR]

Environment consists of Physical chemical and biological condition of a region in which an organism lives.

(i)Physical conditions that environmental study deals with are the atmosphere, the land, the rivers and the oceans

(ii)The biological condition includes an living organisms beginning from lowest micro-organisms (like bacteria, virus, fungus etc.) to plants and animals including man.

(iii)Chemical condition includes the great chemical cycles that flows through the physical and biological systems'-(Respirator system, nervous system).Therefore, environment is the sum total of all the conditions and influences the development of life of all organisms on the planet earth.

SCOPE & IMPORTANCE

SCOPE OF ENVIRONMENTAL STUDIES

*The planet earth provided the right environment for the origin of on it Pure air and natural cycles like water cycles, nitrogen cycles ,oxygen cycles etc, helped in the evolution of plants, animals and man in this planet.

*The early man lived in harmony with nature. Man tried to improve his life style with development of science and technology.

*Population explosions beyond control and man's greed led to over exploitation of nature and natural resources.

*The history of human civilization has now reached a stage of crisis, where very survival of human race is under threat. All the above problems have occurred in last century.

*A perusal of the development history of environmental studies made during last century is based upon three principal aspects. Such as

(1) Taxonomic

affinities (2)Habitat

(3) Level of organisation

BASED ON TAXONOMIC AFFNITIES

In the early days of 20th century study of environmental science was confined to Botanists and Zoologists who studied the ecology of plants and animals respectively. This led to the development of sub-division like(i)Plant ecology and (II)Animal ecology, Modern ecologists feel that ,these two group of organism(plants and animals)are very much inseparably interrelated with each other .Thus, modern prefers not to make distinction between plant ecology and animal ecology. Rather, the term ecology includes inter-relationship among all kinds of organisms (including microorganisms) with their environment.

BASED ON HABITAT

The habitat influences the morphology, anatomy and physiology of living organisms. The abiotic and the biotic components interact in a system called ecosystem such as

FRESH WATER ECO SYSTEM..

Where the biotic and the abiotic components of ponds, lakes, rivers, streams interact.

MARINE ECO SYSTEM..

Where the biotic and the abiotic components of sea, ocean interact.

ESTUARINE ECO SYSTEM.

Where biotic and the abiotic components interact at estuarine (mouth of rivers) points.

TERRESTRIAL ECO SYSTEM..

Includes forest ecosystem cropland (man-made) ecosystem, grassland ecosystem, desert eco system etc. Where biotic and abiotic components of the respective habitat interact. The producers synthesize carbohydrate type of food in the presence of sun light. The consumers grow, flourish and reproduced by getting the energy from the producers. The decomposers the dead bodies of producers and consumers and increase the nutrient pool of the eco system .There is continuous food chain, food web, energy flow and nutrient cycle in all eco system. The eco system are in a state of dynamic equilibrium.

BASED ON LEVELS OF ORGANIZATION..

Scope of environmental studies may either be limited to (a) individual organism (Autecology) or (b)group of organisms (synecology).

AUTECOLOGY..

Includes the study of relation of individual species to its environment .Here individual species are the units of study .The studies include effect of different environmental factors on the geography distribution, morphology, taxonomic position and life cycle of the individual species.

SYNECOLOGY..

Include the study of relation of group of organisms (known as community) to their environment. It is an interrelationship between plants, animals, microbes etc.

Depending upon the conditions synecology may deal with

(a)Population ecology.

Where the unit of study includes a group of individuals of any one kind of organisms and their interaction with their respective environment.

(b)community ecology.

Where the unit of study includes an population of given area and their interaction with the environment.

IMPORTANCE OF ENVIRONMENTAL STUDIES..

Some of the importance points are given below.

(1). Having a “positive impact” on quality of life.

(2). Knowledge about various types of Environments and different Environment hazards.

(3). It helps maintain ecological balance by providing a basic operating knowledge of environmental system and process.

(4). This discipline helps to educate people regarding their duties towards environmental protection.

(5). It provides us with basic knowledge of environment and various environmental issues.It examines the scientific basic for environmental and social concerns about our present energy need, global climate changes, toxic emission and waste disposal.

(6). It also provide knowledge about the development and utilisation of energy resources and the role of public policy there in.

(7). Need for wise planning of development.

(8). To aware and educate people regarding environmental issues and problems at local, national, and international levels.

(9). It plays an important role in healthy living of human

being. (10). It plays an important role in regulating air and

water etc.

NEED FOR PUBLIC AWARNESS

Public awareness

- Environment is a serious issue not only for India for the world an well.
- This matter need to be imparted to the ignorant and illiterate people.
- The gradual degradation of environment and its necessary restitution must have got wider circulation.
- Due to faulty planning and policy of government the environment is affected. Importance should be given for the restoration of environment.
- Individual s must be aware of the importance of environment.
- Individuals must plant trees on the basis of principle “each one plant one”.
- Follow and waste respect environment protection laws.
- Minimize waste production.
- Take care of soil and land.
- Prevent and control all kinds of pollution.
- Clean the surrounding near the habitation.
- Educate others to develop awareness about the environment.
- Support govt. Policies and systems for protection of environment

POSSIBLE SHORT TYPE QUESTIONS WITH AMSWER

What is the Environment? [W-16,17,19,20,21]

Ans : Environment is the Physical, chemical and biological condition of the region in which Organism lives. Therefore Environment is the sum total of all condition and influences the development and life of all Organisms on the Planet earth**.**

What is Ecology ?

Ans. The term ecology is defined as an inter- relationships among all kinds of Organisms with their environment**.**

What is Synecology?

Ans: .Synecology defined as the study and relation of group of Organisms to their environment. It is an Inter relationship between Plants, animals, microbes etc**.**

POSSIBLE LONG TYPE QUESTIONS

Q-1. Write down the Concept of Environmental studies and its necessity for public awareness. [W-16]

Q-2. Write down the role of an individual protecting environment. [W-22]

Q-3. How is Public awareness necessary to protect our environment? Describe briefly. [W-19,21]

UNIT-2

NATURAL RESOURCES

Learning objectives

Renewable and non renewable resources:

a) *Natural resources and associated problems.*

- *Forest resources: Use and over-exploitation, deforestation, case studies, Timber extraction mining, dams and their effects on forests and tribal people.*
- *Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dam's benefits and problems.*
- *Mineral Resources: Use and exploitation, environmental effects of extracting and using mineral resources.*
- *Food Resources: World food problems, changes caused by agriculture and over grazing, effects of modern agriculture, fertilizers- pesticides problems, water logging, salinity, .*
- *Energy Resources: Growing energy need, renewable and non-renewable energy sources, use of alternate energy sources, case studies.*
- *Land Resources: Land as a resource, land degradation, man induces landslides, soil erosion, and desertification.*

b)Role of individual in conservation of natural resources.

c)Equitable use of resources for sustainable life styles.

NATURAL RESOURCES AND ASSOCIATED PROBLEMS

NATURAL RESOURCES.

- The raw materials which are derived from the nature is called natural resources.
- Otherwise the resources which one derived from the nature is called natural resources.

OR

- Natural resources are substances found naturally in the environment.
- Ex-Forest, forests' products, soil, water, sunlight, minerals treated as natural resources.
- Mankind utilises the resources to get energy and for benefits.

IT IS OF TWO TYPES..

(a) Non- renewable resources

(b) Renewable resources

NON- RENEWABLERESOURCES:

- It is otherwise called as stock resources. Because these resources are availed to us as a stock of material and that is likely to be depleted completely and can not regenerated or can notre fulfilled and it cannot availed indefinite period of time.
- It is otherwise called exhaustible resource because after some years it will depleted completely.

. Ex- Petrol, coal, natural gas, metals (such as iron, copper, nickel etc)

and Non-metals such as potassium, phosphates etc.

. These resource are non-eco friend of the environment because they are polluted the atmosphere

RENEWABLE RESOURCES.

. Renewable resources do not exhaust non it is used up. They are produced by them-selves in the nature and they are harvested continuously through proper planning. So it is reproduceable or re generated and has an endless supply and can be used repeatedly.

. Ex- Solar energy, hydel energy, tidal energy, wind energy etc.

. They are eco friend for the environment. Because these are pollution free sources.

FOREST RESOURCES:-USE & OVER EXPLOITATION :

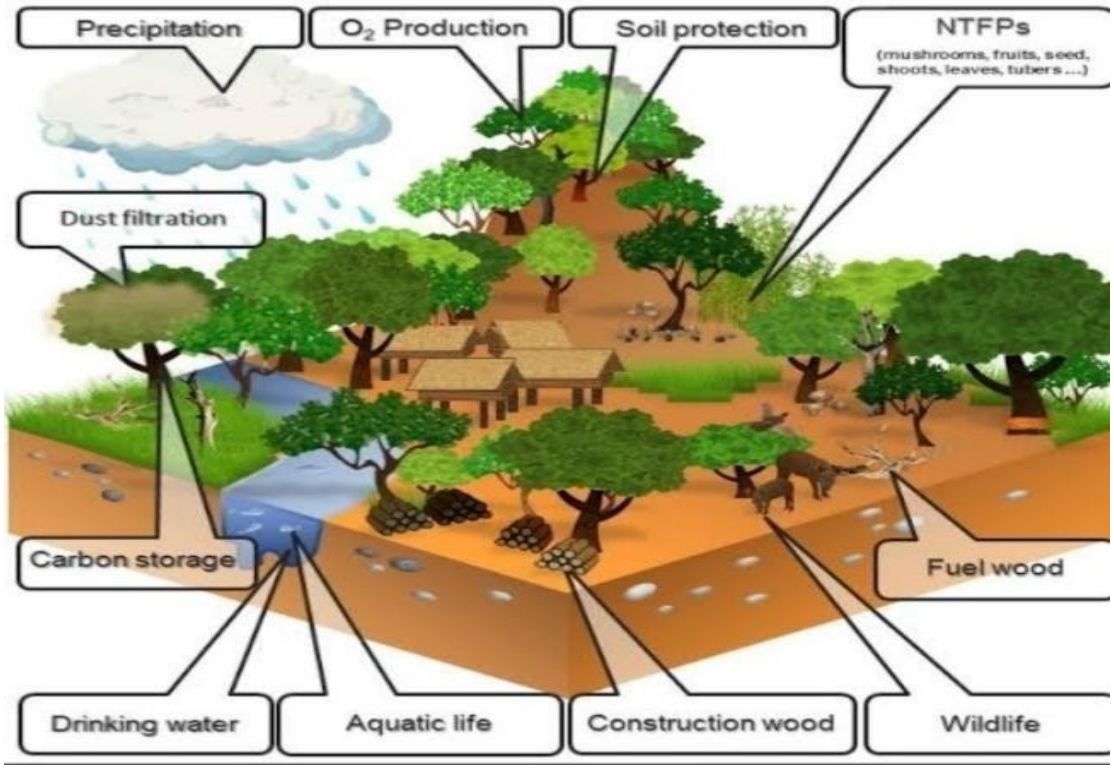
Forest Resources :

The collection of trees and shrubs is known as forest resources

Use and overexploitation:

Scientists estimate that India should ideally have 33% of its land under forests .Today we have only about 12% .

However, the rest of us also derive great benefits from the forests which we are rarely aware of . The water we use depends on the existence of forests on the watersheds around river valleys .Our homes ,furniture and paper are made from wood from forest .We use many medicines that are based on forest produce .And we depend on oxygen that plants give out and removal of carbon dioxide we breathe out from the air .



Forests once extended over large tracts of our country .People have used forests in our country for thousands of years .As agriculture spread the forests were left in patches which were controlled mostly by tribal people .They hunted animals and gathered plants and lived entirely on forest resources .

Another period of overutilization and forest degradation occurred in the early period following independence as people felt that the British had gone they had a right to using our forests in any way we pleased .

The following years saw India‘s residual forest wealth dwindle sharply .Timber extraction continued to remain the forest Department’s main concern up to the 1970s .The fact that forest degradation and deforestation was creating a serious loss of the important functions of the forest began to override its utilisation as a source of revenue from timber .

Some important function of Forest:

- All the forests play a vital role in the countries economy.
- The major products of forest are- Timber and fire wood. And minor products are- herbs ,lacs , gums ,canes etc.
- Further our people get employment opportunities in the forest based industries such as khanija industries , sports goods industries, paper industries and matches industries ,furniture industries etc.
- Many cottage industries depend on the raw materials obtained from the forests such as gums , cane ,fibres , spices etc.
- It helps in checking floods and soil erosion.

- Forest exerts a great influence on the climate of a region. They moderate the hot climate of a place.
- Forest also helps in causing rains. The clouds passing over forest area get cooled, thus results in condensation and rainfall.
- It is the source of recreation scenic beauty of the land scape as well as home of precious wild animals. All the above forest resources are to carefully conserved.
- Plants maintain the balance of co2 gas it can take co_2 gas at the time of photosynthesis and release o_2 gas which is important for every living organism and it is the rapport of tribal peoples and also abode of wild animals. Thus we should conserve our forest resources.
- The greater value of the forest are to be realized as protectors of the environment and abode of wild animals rather than a sources of timber , so deforestation will be arises is to be describe.

Over utilization

- Day by day mans interventions with nature drastically increase. To meet his basic requirements. He is using for shelter , cultivation , industries , dam, commercial purpose, roads , towns ,and different projects.
- Due to this reason the forest resources gradually decreased a result of deforestation occurs for that soil erosion, land degradation, nutrition loss and disruption of delicate equilibrium soil ,plant atmosphere.
- That can be seen in the vast tracts of barren land which are on the verge of becoming deserts and loss of wild life, they are by in imbalance occurred in the forest ecosystem.

Deforestation:

The meaning of deforestation is destroying forest ,which means random cutting of trees .

Or

Deforestation is the permanent destruction of forest .In order to make the land available for other uses such as:- Roads ,Dams ,Towns ,Homes ,Cultivation , Farmland ,Building materials ,Firewood ,Industrial purpose etc .

Causes:-

Some of the following causes are :-

- Development of projects
- Shifting of cultivation
- Demand for fire wood
- Demand for industries and commercial purposes

Development of projects:-

In the name of Development the first to be destroyed is forest , next comes wild animals and some extend tribal people the worst suffer is the environment as a whole .

- After independents a number of multipurpose river valley projects has worked

- A huge single dam or series of small dams are built on a river and its tributaries
- These dams collects vast amount of water forming manmade lakes .
- The dam controls flood and protects the soil from being washed away during flood .
- The water i.e., collected is used in irrigating farms in command areas during the dry seasons.
- When water is made to fall from a high speed , it helps in generating power .It is known as hydel power and it is eco friends of the environment .
- The lakes that are formed due to storage of water offers ideal conditions for development of fisheries and that water provides for domestical uses .
- The huge water bodies become centers of tourist attraction and large water resources is used for industrial purposes .

Shifting of Cultivation:-

- Shifting cultivation is an old age practice with some water resources the land is cultivated for 2 to 3 seasons .
- More and more forests are slashed ,burned and converted into agricultural land .
- This method of cultivation causes extreme deforestation . Shifting of cultivation seen in Assam ,Manipur ,Mizoram ,Nagaland and Odisha .It is otherwise called as Jhoom cultivation .

Demand for industries & commercial purposes :-

Establishing of industries purposes of commercial the forest resources also destroyed .Due to construction of building , construction of roads , construction of railways also destroy the forest plants .Accept that mining activities also destroy the forest resources and that are the cause of deforestation .

Effects:-

1. Global warming

Deforestation has a direct impact on natural climate change. Their by increasing the global temperature with decreasing the area of forest .The rain is also becoming irregular . This contribution to global warming which has indirect impact on industry .

Green plants uses co_2 gas for the manufacture of food by photo synthesis .That take co_2 gas and give out o_2 gases with helps us for respiration .Except it ,it controls hydrogen sulphite and chlorine these two gases are polluted gas .Plant control this gases from atmosphere .

2. Endangering Tribals

- Forest is essential for the survival of tribals .
- Forest is their livelihood .
- The tribals take as much as need from the forest and in exchange and they fulfill their need.
- The thinking of modern society has made use an object of profit for that the tribals are suffered in different ways . Such as

1. Resettlemen

t 2.Land slide

3.Diseses

CASE STUDIES,

Joint Forest Management

The need to include local communities in Forest Management has become a growing concern. Local people will only support greening an area if they can see some economic benefit from conservation. An informal arrangement between local communities and the Forest Department began in 1972, in Midnapore District of West Bengal. JFM has now evolved into a formal agreement which identifies and respects the local community's rights and benefits that they need from forest resources. Under JFM schemes, Forest Protection Committees from local community members are formed. They participate in restoring green cover and protect the area from being over exploited.

TIMBER EXTRACTION MINING,

.Timber extraction ,mining and dams are in variably parts of the needs of developing country .If timber is overharvested the ecological functions of the forest are lost .Unfortunately forests are located in areas where there are rich mineral resources .Forests also cover the steep embankments of river valleys ,which are ideally suited to developed hydel and irrigation projects .Thus there is constant conflict of interests between the conservation interests of environmental scientists and the mining and irrigation department.

What needs to be understood is that long –term ecological gains cannot be sacrificed for short-term economic gains that unfortunately lead to deforestation .These forests where development projects are planned , can displace thousands of tribal people who lose their homes when these plans are executed . This leads to high levels of suffering for which there is rarely a satisfactory answer .

DAMS THEIR BENEFITS & THEIR PROBLEMS EFFECT ON FOREST AND TRIBAL PEOPLE:

Dam is a artificial barrier which is constructed across a water stream which arrested water for a certain depth .

Benefits:-

Some of the following points are :-

- Irrigation
- Power generation
- Pisciculture
- Food control
- Checking soil erosion
- Domestical uses
- Employment opportunities
- Provide drinking water
- Navigation
- Tourist attraction

- Developing countries economy etc .

Problems:-

- Sedimentation
- Flash flood
- Diseases
- Submerged of plants and animals that reason for extinction
- Habitat loss
- Resettlement problems and rehabilitation
- Land slides
- Water pollution
- Loss of medical plants
- Except that it creates ecological destruction it can be seen disruption it can be seen disruption among the plant ,soil ,animal and atmosphere .

WATER RESOURCES USE AND OVER UTILIZATION OF SURFACE AND GROUND WATER, FLOOD, DROUGHT, CONFLICTS OVER WATER DAM BENEFIT AND PROBLEMS:

Water resources

Water is precious natural resources because all living organism depends upon water for their surviving .Except that it can be uses for irrigation ,power generation ,pisciculture and development of country economy etc.

Water is categorized in two types:

a) Surface water
   Available to use in the forms of river, lakes, ponds etc.
b) Ground water
   Water that is available in the deeper layer of earth.

The world depends on a limited quantity of fresh water. Water covers 70% of the earth's surface but only 3% of this is fresh water. Of this , 2% is in polar ice caps and only 1% is usable water in rivers, lakes and subsoil aquifers.

One of the greatest challenges facing the world in this century is the need to rethink the overall management of water resources .The world population has passed the 6 billion mark . Based on the proportion of young people in developing countries , this will continue to increase significantly during the next few decades . This places enormous demands on the world's limited freshwater supply .

India is expected to face critical levels of water stress by 2025.

Overutilization and pollution of surface and groundwater:

With the growth of human population there is an increasing need for larger amounts of water to fulfil a variety of basic needs . Today in many areas this requirement cannot be met .Overutilization of water occurs at various levels .Most people use more water than they really need .

- Most of us waste water during a bath by using a shower or during washing of clothes .
- Agriculture also pollutes surface water and underground water stores by the excessive use of chemical fertilizers and pesticides
- Industry tends to maximise short-term economic gains by not bothering about its liquid waste and releasing it into streams ,rivers and the sea .

As people begin to learn about the serious health hazards caused by pesticides in their food , public awareness can begin putting pressures on farmers to reduce the use of chemical that are injurious to health .

Global climate change:

Changes in climate at a global level caused by increasing air pollution have now begun to affect our climate . In some regions global warming and the **EI Nino** winds have created unprecedented storms . In other areas ,they lead to long droughts .Everywhere the "greenhouse effect "due to atmospheric pollution is leading to increasingly erratic and unpredictable climatic effects .This has seriously affected regional hydrological conditions

Uses of water

- Domestic use
- Industrial use
- Agricultural uses
- Fishing
- Source of food
- Transportation
- Hydroelectric power

Over exploitation of water

- Depletion of water resources and biodiversity.
- Resources of water.
- Subsidence
- Water logging
- Loss of integrity of fresh water ecosystems

Flood

- This is the natural disaster .
- Excess rain fall of heavy rain fall is the common cause of flood. The banks of the river break down and water rushes to the heavy dart and cultivated land.

- Due to the heavy rain bank of rivers break down and water rushes into field and human habitats causing, severe damage to live stocks and human population besides various vegetation.
- Water is categorized in two types:

c) Surface water
Available to use in the forms of river, lakes, ponds etc.

d) Ground water
Water that is available in the deeper layer of earth.

Drought

- Draught refers to a period of acute shortage of waters severe atmospheric dryness.
- Lack of rain fall of less rain fall of sufficient duration is the common cause of draught.
- Less than 75 % of normal rain fall is officially declared as draught.
- A severe draught causes

a. Wide spread damage to crops
b. Loss of aquatic life

Conflict over water

1.Karnataka and Tamil Nadu :-

There was wide spread violence when Karnataka rejected interim order of handed down by the Cauvery water tribunals , set up by the Indian supreme court to settle decade of water dispute between the two states over irrigation rights to the Carvery river water .

2. Conflict between Kerala and Tamil Nadu :-

Another controversial river is periyar river which is situated in Kerala which is flowing towards the western part of this state . The mullaperiyar dam which is their in the originated place and the river bank favours the inhabitants of Tamil Nadu . But the Idukki hydroelectricity project which is in Kerala cannot materialized due to scarcity of water which create conflict between the two states .

3. Conflict between India and Pakistan :-

Before partition the water of Sindhu, Jhelum ,Chenab were given to Pakistan and the water of Bipasa, Sutlej were given to India fully .Later a barrage was constructed over the Jhelum river named as Wullar barrage . This controversy arises out of this but in 1960 through inter water treaty India only got the rights to establish the production of hydroelectricity but not for Irrigation .

4. West Bengal and Bangladesh :-

Like that another water problem is Farakka barrage which is situated in west Bengal . For this barrage conflict arises in Bangladesh because the river Ganga is a main stream of Bangladesh .Due to this barrage Bangladesh did not provide sufficient of water due to this so vigorous protest was made by Bangladesh .

5. Some of the following examples are

(a) Conflict between Odisha and Jharkhand for Subarnarekha river
(b) Conflict between Odisha and Chhattisgarh for Mahanadi and Indravati

(c) Conflict between Odisha and Andhra Pradesh for Sileru river
(d) Conflict between Bihar and Madhya Pradesh for sone river
(e) Conflict between Haryana and Punjab for canal arising the confluence point of Sutlej and Yamuna .
(f) Conflict between Maharashtra and Andhra Pradesh for dharani river etc.

6. Conflict between Odisha and Andhra Pradesh:-

Polavaram project is multipurpose irrigation project the dam across the "Godavari" river is under construction and it's reservoir spreads in parts of Chhattisgarh and Odisha . It is a multipurpose project of state Andhra Pradesh state . But some parts of reservoir spreads to Chhattisgarh and Odisha .
Chhattisgarh and Odisha contract to a agreement to establish a hydroelectricity power project at konta just upstream of sileru tributary Sabari river . Due to the reservoirs backwater this project cannot be materlisied fully .

Dams:

Today there are more than 45,000 large dams around the world ,which play an important role in communities and economies that harness these water resources for their economic development. Current estimates suggest some 30-40% of irrigated land worldwide relies on dams . Hydropower , another contender for the use of stored water ,current supplies 19% of the world's total electric power supply and is used in over 150 centuries .

Benefits:-

Some of the following points are :-

- Irrigation
- Power generation
- Pisciculture
- Food control
- Checking soil erosion
- Domestical uses
- Employment opportunities
- Provide drinking water
- Navigation
- Tourist attraction
- Developing countries economy etc .

Dams problems:-

- Fragmentation and physical transformation of rivers .
- Serious impacts on riverine ecosystems .
- Social consequences of large dams due to displacement of people .
- Water logging and salinisation of surrounding lands .
- Dislodging animal populations ,damaging their habitat and cutting off their migration routes .
- Fishing and travel by boat disrupted .

- The emission of green house gases from reservoirs due to rotting vegetation and carbon inflows from the catchment is a recently identified impact .

- **MINERAL RESOURCES- USE AND EXPLOITATION, ENVIRONMENTAL EFFECT ON EXTRACTING AND USING MINERAL RESOURCES:**

Mineral Resources

A mineral is a naturally occurring substance of definite chemical composition and identifiable physical properties .

Many of the resources are hidden under the earth surface on which we live in .

An ore is a mineral or combination of minerals from which a useful substance ,such as a metal , can be extracted and used to manufacture a useful product .

The mineral resources are classified into two categories.

1. Metallic
2. Non-Metallic

Metal	Non-Metal
Iron ,gold ,silver ,copper ,chromides etc. are known as metal because It is special group of chemical elements from which new product can be generated .The new product usually occurs through a process of melting ,mixing ,and cooling . The Nature of these the materials are :- It is hard in nature It is good electrical conductivity Malleable Fusible Ductile It is good thermal conductivity	Coal ,Natural gases ,various mineral salts are taken to be non –metallic mineral resources because it is special group of chemical elements from which no new product can be generated . The Nature of these the materials are :- They are poor conductor of electricity Not malleable Not ductile They are brittle in nature etc.

Minerals and their ores need to be extracted from the earth's interior so that they can be used .This process is known as mining .Mining operations generally progress through four stages:

(1) Prospecting: Searching for minerals.
(2) Exploration: Assessing the size, shape, location, and economic value of the deposit.

(3) Development: Work of preparing access to the deposit so that the minerals can be extracted from it.
(4) Exploitation: Extracting the minerals from the mines.

Uses and exploitation of mineral Resources :-

- Manganese and chromium are used in the production of steel.
- Copper and Aluminium are used in electrical industries as conducting wire and Aluminium is used in air craft industries.
- Lead and Zinc are used in various batteries.
- Mica is used as an insulator in electrical industries.
- Thorium ,Uranium have applications in atomic reactor for production of the electricity.
- Phosphate ,Nitrate , Potassium ,Sulphur have wide application of agricultural and medicine industries .
- Aluminium is used for light weight vehicles and roofing materials.
- Lime stones are used in cement industries .
- Coal is used as major fuel in thermal power power plant for the production of electricity .
- Tin is used for packaging industries .
- Dimond , Gold & Silver are used for ornaments industries .
- Aluminium is a good conductor of heat .So it is very useful for boiler , cookers and cook wares .
- Aluminium is good conductor of electricity so used for over head power cables etc.

ENVIRONMENTAL EFFECTS OF EXTRACTING AND USING MINERAL RESOURCES.

In open mines where coal is extracted near the surface , the removal of coal is followed by damage to the soil and live cover .

- That causing living behind barren .
- In coal mines some garbage comes to be earth surface among them core element named as sulphur comes to the surface of the earth .When it mixing with the rain water it turn into sulphuric acid which destroy aquatic life in that nearby stream.
- Industrial utility create smoke contain carbon monoxide ,Sulphur dioxide ,Sulphur trioxide when these gases are mixes in the water vapour in the atmosphere it causes acid rain .
- Similarly S02 is injurious to human health and reduces plant growth . It causes asthma and bronchitis in human etc .

FOOD RESOURCES –

WORLD FOOD PROBLEMS, CHANGES CAUSES BY AGRICULTURE, FERTILIZER-PESTICIDES PROBLEMS, WATER LOGGING SALINITY:

WORLD FOOD PROBLEMS

- In recent years world food supply have been rising unprecedented rate and have grown faster than population in every continent except Africa .
- There is enough food to supply everyone in the world with more than the minimum daily food requirement .
- The Three major crops that are the main source of calories and nutrients for most of the world's people are rice ,wheat ,and maize .
- Over the past thirty years the total amount food in the world has increased faster than the average rate of population growth .

CHANGES CAUSED BY AGRICULTURE AND OVER GRAZING :-

- Man depends on plants or on other animals for his food .
- Agriculture includes all productive efforts which are under taken by man to expedite and improve the growth of vegetable and animal product .
- The main aim of agriculture is to raise crops and plants ,domestic animal and earn maximum benefit out of it in the form of food.
- With the variation in the distribution of temperature rainfall and soil conditions the quality and quantity of agricultural production differ .
- Physical environment plays a major role in the crop production .
- Similarly man cannot regulate quality and quantity of agricultural production which depends fairly on natural phenomena .

EFFECT OF MODERN AGRICULTURE:-

- During the evolution human civilization the mode of resources and pattern of energy flow in agriculture practice took various shapes.
- The transformation from traditional to modern mechanised agricultural practice took some year .
- The aim of such was to sustain a bigger population and to meet the ever increasing need of man .
- Agriculture has evolved from being a less productive to more productive .

FERTILIZER-PESTICIDES PROBLEMS, WATER LOGGING SALINITY:

PESTICIDES PROBLEMS:-

- To protect plants from insects ,rats and fungi ,toxic chemical' like insecticides ,fungicides are generally used . These chemicals are collectively called "biocides"
- Another problem related to excessive utilization of plant protection, chemically that the targets organism.(pest ,weeds ,and fungi)are gradually becoming immune to the pasticides .
- The measure problem of application of plant protection chemical is contamination of food items.

WATER LOGGING:-

- Water logging can be described as stagnation of water on top of the soil surface and the presence of a high water table inside the soil .Water logging of the soil or deeper submergence occur when water enters soil faster than it can drain away under gravity .
- To provided more water to agriculture fields man has developed different method's .
- Canal irrigation use of deep tube well for drawing water from deep core of the earth are two common methods employed .
- In these two methods when water is available in agricultural field are irrigated excessively without proper drainage system .
- The solid-liquid-air ratio is distributed
- The soil becomes drenched and remains soaked with water ,This is called water logging .
- Water logged soil cannot support plant growth because the lack air which is essential for root respiration.

SALINITY:-

- Excessive in high temperature zone causes sort accumulation in soils .
- Due to high temperature water evaporates very fast , leaving behind traces of salt on the soil .
- Gradually the general concentration of salt on the upper layer of the soil increases .
- In salt affected soil plants fails to absorb nutrients and face water stress .

ENERGY RESOURCES - GROWING ENERGY NEED RENEWABLE & NON-RENEWABLE ENERGY RESOURCES. USE OF ALTERNATE ENERGY SOURCE CASE STUDIES:

Energy Resources

Energy is the major index to develop the country economy .We are getting energy from these resources and using our home purposes , industrial purposes ,for other developmental activities .

On the basis of the pattern and nature of use and it 's contribution energy may be sub-divided into two groups .

Traditional / Conventional Energy

This type of energy sources are known to man since long which may be renewable or non – renewable type.

Most of the traditional type of energy are derived from fossil fuel like coal ,petrol ,diesel etc .

Non traditional Energy:

This type of energy sources are new to mankind , Which may be renewable or non-renewable .It is otherwise called as non-conventional energy .The non-traditional energy sources are Wind energy ,Solar energy ,Tidal energy ,Hydropower energy etc.

These are all eco-friendly energy resources.

Further on the basis of the nature of availability energy may be classified as follows .

(1) In exhaustible energy or Renewable sources of energy
(2) Exhaustible energy or Non-renewable sources of energy

GROWING ENERGY NEED RENEWABLE & NON-RENEWABLE ENERGY RESOURCES

Fossil fuels ,Nuclear energy are non eco-friendly and are responsible for different types of pollution but pollution free energy are environment friendly and future development of the worked lies in the use of renewable energy sources .

Some of the renewable energy sources are :-

- Solar energy
- Geothermal energy
- Tidal energy
- Wind energy
- Biomass energy etc

SOLAR ENERGY:-

Sun rays are tapped in photo voltaic cells which are then converted into energy this is known as solar energy .

It is the conversion of energy from sunlight to electricity.

Some of the Important uses are :-

- To generate electricity
- Now it is being more and more used just like water heater
- Crop dryers
- Lighting lamps in remote areas.
- It is used by plants for the process of photo synthesis
- It is used for cooking purposes
- It is used for drying clothes

GEOTHERMAL ENERGY:-

Below the earth's crust temperature increases with depth .Temperature at the core of the earth may go up to 4800 degree centigrade where all the heavy metal are in molten lava state .If cracks develops in the crust ,then the magma from metal comes out vigorously .The

tremendous heat can successfully be tapped and can be converted into electrical energy i.e. popularly known as geothermal energy.

This possible areas are from where geothermal energy can be tapped are geysers ,volcanoes etc.

WIND ENERGY:-

The moving air has huge amount of Kinetic energy and this can be transferred into electrical energy.

Wind turbines converts the Kinetic energy into mechanical power and a generator can converts this mechanical power into electricity.

TIDAL ENERGY:-

Tidal power is called tidal energy. It is a form of hydropower energy and i.e. useful forms of power mainly electricity .

Tidal energies produced through use of tidal energy generator .These large under water turbines are placed an areas with high tidal moment and are designed to capture the kinetic energy of ocean tides in order to produce electricity .It has great potential for future power of electricity generation because massive size .

BIOMASS ENERGY:-

Biomass can be both animal and crop waste .Biomass is a renewable source of fuel to produce energy waste residues always exists in terms of scrap wood. Biomass contain stored energy ,That's because plant absorbs energy from sun through the process of photo synthesis .When bio mass is burned the store energy is released as heat and that heat energy converted into electric energy .

NON RENEWABLE SOURCE OF ENERGY:

1. **PETROLEUM:-** Petro means mines oleum means oil so petroleum means mining oil . Otherwise called as rock oil .It is a complex composition of carbon and hydrogen ,Basically it is used in motor fuel , lubricants and produced different kinds of synthetic products known as petrochemicals .
2. **NATURAL GAS:-** Gas reservoirs are generally found in association with oil field. It is a tremendous heating power .It is used both industrial raw material and petrochemical industry and source of energy.
3. **COAL** :- It is sedimentary deposit formed by the slow action and heat and pressure on forest burred under the earth crust .Basically it is used in industries and thermal power plant .

Use of alternate energy sources

Here's a quick-reference list of some of the most common sustainable energy resources that we use today.

1. Wind Energy

Wind power has tripled over the past 10 years in the United States, making wind energy the number one largest renewable energy source in the nation. Wind power is one of the alternative energy sources that serves both individuals and entire communities. It's versatile, and can be produced from small-scale windmills or wind turbines on residential properties to large-scale offshore wind farms in the ocean.

2. Solar Energy

Solar power most commonly refers to the use of photovoltaic cells (or solar cells) to create energy. On a small scale, you may see a few solar panels on a house roof used to produce energy for just that one home. On a larger scale, you may see a solar farm used as a power plant to produce electricity for their consumers.

3. Hydroelectric Energy

Generated from the energy of moving water, hydroelectricity (also known as hydropower) is produced when water behind a dam causes turbine blades to move as it flows through an intake. The turbine blades then rotate a generator to produce electricity that is sent to power homes and businesses.

4. Geothermal Energy

We generate geothermal power by tapping into underground reservoirs of hot water and steam. Geothermal electricity can directly heat and cool buildings.

5. Bioenergy

We generate bioenergy from organic materials known as biomass or biofuels. Some examples would be recently living animal or plant byproducts and wood. For example, methane can be captured from landfills to produce bioenergy, which we then used to produce electricity and heat. Ethanol is one example of a biofuel that many people are familiar with.

6. Nuclear Energy

Nuclear energy is created in the form of heat through the fission process of atoms. The initial fission process creates energy and triggers a chain reaction that repeats the process and generates more energy. In nuclear power plants, the heat that fission produces creates steam. The steam then rotates a turbine, which leads to the production of electricity.

7. Hydrogen Energy

Hydrogen is used as a clean-burning fuel, leading to fewer pollutants and a cleaner environment. We also use it for fuel cells. These are similar to batteries and are used to supply power to electric motors.

8. Tidal Energy

With the movement of the tides, we get tidal energy when the kinetic energy of the water movement converts into electrical energy. Of course, this is one of the location-specific sources of energy, but it's very effective. Tidal energy is renewable and produces large amounts of energy even with low-speed tides.

9. Wave Energy

Wave energy is an alternative energy source derived from waves as they move across the water. Wave energy uses electricity generators placed on the ocean's surface. Wave

height, wavelength, wave speed, and water density determine the energy output. Wave energy is environmentally friendly, renewable, and harmless to the atmosphere.

CASE STUDIES

• In 1981, a plane called 'The Solar Challenger' flew from Paris to England in 5 hours, 20 minutes. It had 16,000 solar cells glued to the wings and tail of the plane and they produced enough power to drive a small electric motor and propeller. Since 1987, every three years there is a World Solar challenge for solar operated vehicles in Australia where the vehicles cover 3000 kms.

• The world's first solar-powered hospital is in Mali in Africa. Being situated at the edge of the Sahara desert, Mali receives a large amount of sunlight. Panels of solar cells supply the power needed to run vital equipment and keep medical supplies cool in refrigerators.

• Space technology required solar energy and the space race spurred the development of solar cells. Only sunlight can provide power for long periods of time for a space station or long distance spaceship.

• Japanese farmers are substituting PV operated insect killers for toxic pesticides.

• In recent years, the popularity of building integrated photovoltaics (BIPV's) has grown considerably. In this application, PV devices are designed as part of building materials (i.e. roofs and siding) both to produce electricity and reduce costs by replacing the costs of normal construction materials. There are more than 3,000 BIPV systems in Germany and Japan has a program that will build 70,000 BIPV buildings.

LAND RESOURCES – LAND AS A RESOURCE, LAND DE-GRADATION, MAN INCLUDES LAND SLIDES, SOIL EROSION & DESERTIFICATION:

Land as a Resource:

- The part of the earth's surface that is not covered by water .
- Earth is the only known habitat for living organism with land and water that supports myriad forms of life .
- Land is an important base and medium for the origin and evolution of life, including humans.
- Land constitutes about 29.22% of the total surfaces area of the earth and India shares only 2.4% of the total land area of the world .About 40%otf the earth's land area (14.78 millions)square kilometre .
- Ever growing world population puts pressure for higher production of food grown and other crops .Thus has put heavy demand on land .
- In addition land is required for other developmental activities like housing ,construction of roads ,entertainment parks ,industries ,dam etc.
- Due to effective use of labour and technology ,productivity per unit of land has increased .

- Through expansion of crop lands has been done by cleaning forest ,now the crops lands are used for non-agriculture purpose in the name of industrification and urbanization .
- The ripper surface layer of the earth is known as soil . Soils are derived from parent rock material through the process breakup or wear and tear .

Land Degradation :-

- Soil erosion is the one of the phenomena of land degradation .
- Land degradation means losses the quality of the soil and decrease the level of nutrition .
- Land degradation means slow death of the soil because the productive may decreases .The land turn into barren and that land gradually turn into deserts .

Causes of land Degradation :-

- Causes of land degradation is of two types
- 1.Human Activities
- 2.Natural Activities

Landslide,

Landslide, also called landslip, **the movement downslope of a mass of rock, debris, earth, or soil** (soil being a mixture of earth and debris). Landslides occur when gravitational and other types of shear stresses within a slope exceed the shear strength (resistance to shearing) of the materials that form the slope.

Soil

The upper surface layer of the earth's is known as soil.

Soil Erosion:

Loss of top soil is known as soil erosion.

Or

In other words soil erosion is the displacement of the upper layer of soil .It is one form of the solid degradation .Soil degradation brings slow death of the soil .So that the reproductive capacity will decreases .

Agents of Soil Erosion :-

The following are the

1 .Deforestation

2. Erosion of water

3. Erosion of wind

4. Stream bank erosion

5. Land slide erosion etc.

Deforestation:-

The process of Deforestation includes clearing of land through failing of treesDue to purpose of development and shifting of cultivation .For this reason vegetative lands turn into barren lands and that barren lands easily washed up during heavy rain .

Erosion of water:-

Action of water removes top soil. The water flowing during heavy rain fall .At that time the top soil losses .

The top soil may be removed as sheet .Sheet erosion causes loss of thin layer of top soil is known as sheet erosion .

In the second stage the figure like rills appear on the land scale is known as rill erosion .

Stream Bank Erosion:-

The rivers during flood splash their water against the banks and cuts through them particularly at curves .Water strikes the bank with great speed causing of land which gets washed away .

Erosion by wind:-

Soil erosion by wind in common in dry regions where soil is sandy and vegetation may be poor or even absent .Due to heavy wind fined loos soil particles are from the surface of land and are transported to far off places .

Soil transported in a series of short bounces is called saltation .

Slip erosion :-

Heavy rain increases the weight of the rocks at the cliff which come under gravitation force and finally slipped . Sometimes entire heal lock may slide down due to heavy rain fall.

Desertification

Desertification occurs as a result of a long-term failure to balance human demand for ecosystem services and the amount the ecosystem can supply. The pressure is increasing on dryland ecosystems for providing services such as food, forage, fuel, building materials, and water which is needed for humans, livestock, irrigation, and sanitation. This increase is attributed to a combination of human factors (such as population pressure and land use patterns) and climatic factors (such as droughts). While the global and regional interplay of these factors is complex, it is possible to understand it at the local scale.

Human Activities:-

The intervention of humans is as follows

- Deforestation
- Farming
- Mining Activities
- Developmental Activities just like new settlement ,transport communication ,development of projects ,constructional work etc.

Deforestation:-

Increased demand for food ,demand for fire wood ,development of project ,other developmental works have a direct effect deforestation .

The consequences of deforestation in terms of soil erosion ,land degradation ,loss of nutrition ,disruption of delicate equilibrium among soil, plant , animal and environment and that can be seen in the first tracts of barren land which becomes a verge of desert.

Increase the evaporation increase in the incoming radiation reaching soil surface . All these changes together causes serious changes in the environment.

Farming:-

In an old age practice the field was cultivated once a time in a year . That time the field was cultivated by manual labour and cattle. The civilization of man was developed by agriculture .At that time the field was left ideal because the soil can get sufficient time to replenish the moisturizing capacity .But the recent time modern agricultural activities , mechanical support ,using of fertilizers ,spraying of insecticides ,and pesticides enhance the production capacity of the agricultural land .

Now- a- days farmers cultivated their land no. Of times in a year .That for production capacity also increases but reduces the soil quality .After using no. Of times the field does not replenish the moisture and goes to degraded .

Mining Activities:-

Natural resources play vital role for countries economy development .Mining activity also reduces the quality of the soil .At mining area seen different types of the tunnels and shafts where the minerals are extracted .At the time of extraction debris also come out and mixing with soil days per days it stored on the top soil and reduce the quality of the soil and also destroy live cover .

In the mining activities due to shaft and tunnels the particles of the soil can losses due to frequent used and also reduces the soil quality and sometimes it causes slide erosion .

Developmental Activities :-

Other constructional works such as road ,rail ,industrial settlement etc .losses the quality of the soil .

Another thing is that development of dam transport communication work also destroy the top soil and eroded the nutrition .

Natural Activities:-

Change in temperature , irregularity rainfall also causes the degradation of soil

b) ROLE OF INDIVIDUAL IN CONSERVATION OF NATURAL RESOURCES

- Man to mankind are integral parts of nature .Man can be considered in isolation from his environment.
- Components of environment like Water ,Land ,Minerals ,Forest ,Wind energy etc.
- Human themselves also resources of nature

The role of man ,as an individual is listed below:-

- **Environmental Awareness :**Individual must be aware the importance of environment
- **Afforestation :** They must plant trees on the basis of principle “each one plants one”
- Make rational use of natural resources.
- Recycle waste to generate wealth
- Minimise waste production
- Educate others to developed awareness about environment.
- Use bio fertiliser in place of inorganic fertiliser .
- Take steps to conserve forest and wildlife
- Follow and respect environment protection laws.
- Prevent and control all kinds of pollution
- Take care of land and soil
- Clean the surrounding near habitation
- Adopt biogas technology
- Ensure safe disposal of domestic wastes.

c) EQUITABLE USE OF RESOURCES FOR SUSTAINABLE LIFE STYLES :

- Natural resources are rare material obtained from nature
- If may expect to have a bright future on earth then we must utilise the resources
- Wise management of resources will ensure a continuous supply this involves renewable recovering and recycling of resources .
- Man living condition and life style is fully depend on growth development and recycling of resources.

- The basic element of a good qualities of life include safe drinking water , food security ,safe shelter and proper sanitation.
- We must change our approach to life and developments. There should be social equity that deals with the provision minimum requirement of food clothing and shelter .
- Natural planetary resources should be conserved to keep the natural life and sustaining cycles . after etc.

POSSIBLE SHORT TYPE QUESTIONS AND ANSWERS

Q. 1 Why conservation of Natural Resources is necessary ? [W-16]

Ans-The natural resources should be conserved to keep intact the natural life-supports areas and take steps to avoid further ecological disaster by adopting low energy ,non-polluting process based on renewable resources .

Define Renewable and Non –Renewable Resources. [W-16,19]

Ans-Renewable resources do not exhaust non is used up . These are produced by themselves in nature and they are harvested continuously through proper planning and Management .In fact the source is permanent.

Non-Renewable resources on the other hand are available to us as a stock of material that is likely to be depleted completely .Since nonrenewable resources gradually depletes and can not available for infinite period .They are also known as stock resources .

What is Drought ? [W-16,20]

Ans- Drought refers to a period of acute shortage of water , and severe atmospheric dryness .Lack of rain fall or less rain fall of sufficient duration is the common cause of drought . Less than 75% of normal rainfall is officially declared as drought .

What is Jhum Cultivation? [W-18]

Ans- Jhum (Shifting) cultivation is a primitive practice of cultivation is states of North eastern region of India and people involved in such cultivation are called Jhumia .The practice involves cleaning forest cover land of hills ,drying and burning it before onset of Monsoon and cropping on it there after .

Q.5 What do you mean by wasteland reclamation? [W-18]

Ans- It is the process of turning barren ,sterile waste land into something that is fertile and suitable for habitation and cultivation .

What is deforestation? [W-19,20]

Ans-Deforestation means destroying forest. Destroying forest is a term which means random cutting of trees including failing and removal of forest .The main causes are –(1)Shifting cultivation (2)Development projects (3) Demand for fine wood (4)Demand for industry and commercial purpose .

What are Renewable and Non-Renewable energy sources ? [W-19]

Ans-Non-Renewable energy sources-This type of energy is known as exhaustible energy. After use such type of energy is lost forever and cannot regained again .

Renewable Energy – This type of energy is known as Non-exhaustible energy sources .This type of energy may be ubiquitous like solar energy and may be self Renewable type like flow of river water which produce hydel power .

Q.8- What is soil Erosion ?[W-21,22]

Ans.-Soil erosion is the displacement of the upper layer of soil. it is one form of soil degradation. soil degradation brings slow death of the soil so that the reproductive capacity will decreases.

Q.9-Define Natural Resources?[W-22]

Ans-Natural Resources are the resources that exist in nature independent of human action for their development. Natural resources are natural occurring materials

Ex-air, sunlight, soil, water, plant, coal, iron, gold etc.

Q.10-Write down the two examples of non renewable resources.[W-22]

Ans.-Two examples of non renewable resources are oil, natural gas.

POSSIBLE LONG TYPE QUESTIONS:-

Q. 1What is the need of land Resources ? Write the main reason of degradation of land. [W-16,19,20]

Write the uses and over-exploitation of forest resources and discuss deforestation.[W-16]

Explain world food problem. [W-16,20]

What are the causes and effects of deforestation ? [W-17,19,20]
What are the effects of over grazing ? [W-17]

State and explain the renewable and non –renewable natural resources.[W-17]

Describe the impact of modern agricultural practices on environment .[W-17,22]

Briefly explain about water logging.

Write the role of an individual in conservation of natural resources. [S-18]

Write the causes and consequences of deforestation.[S-18]
Give a case study of conflict for water. [S-18]

Write the basic principles of methods of soil conservation. [S-18]

Show that ,equitable use of natural resources is the need for sustainable life- style.[W-18]

What are effects of modern agriculture on world food resources ? [W-18]

What are mineral resources ? Write the various adverse effects of mining ? [W- 18,20,22]

What are significant contributions and effects of dams ? [[W-18]
Briefly ,explain about the causes and consequences of drought. [W-18]

Give a detailed description about the mineral resources of India.[W-19]

Describe the role of Individual in conservation of natural resources. [W-19]

What is World food problem ? Explain detail. [W-19]

What is Global warming? Write down the effects of global warming.[W-20]

Q.22What are the effects of modern agriculture.[W-22]

Q.23 Describe about bio-gas plant.[W-22]

UNIT -3

SYSTEMS

Learning objectives

- *Concept of an eco system.*
- *Structure and function of an eco system.*
- *Producers, consumers, decomposers*
- *Energy flow in the eco systems.*
- *Ecological succession*
- *Food chains, food webs and ecological pyramids.*
- *Introduction, types, characteristic features, structure and function of the following eco system:*
- *Forest ecosystem*
- *Aquatic eco systems (ponds, streams, lakes, rivers, oceans, estuaries).*

CONCEPT OF AN ECO-SYSTEM:-

The ecosystem may be defined as a system in which the living and non-living things of environment function together is called ecosystem and the living organisms and non-living things in environment interact by means of food chain and chemical cycles resulting in energy flow.

Like our home, an ecosystem is any community of living and non living things that work together. The living things are biotic features, and the non living things are a biotic features.

STRUCTURES AND FUNCTION OF AN ECO-SYSTEM:

The different natural ecosystems are pond, lakes , oceans ,forests deserts etc.

An ecosystems , be it a forest, desert has the following component

1. Abiotic components
2. Biotic components which include

a) Producers
b) Consumers
c) Decomposers

Abiotic components:

- The nonliving environment such as air ,water, soil ,basic elements and compounds the abiotic components of an ecosystem.
- These non living substances enter the body of living organisms. The a biotic components of an ecosystem are divided in to three parts.
- The climatic condition and physical factors, temperature, humidity etc.
- Inorganic substances such as water carbon, nitrogen ,phosphorus etc. which are involved in cycling of materials in ecosystem.
- Organic substances such as proteins ,carbohydrate, lipid etc. which form the living body and link abiotic and biotic components.

PRODUCERS, CONSUMERS, DECOMPSERS:

Biotic components:

Producers:

Producers are green plants such as trees, grasses etc. they poses green pigments called chlorophyll. They can convert to chemical energy from sunlight to chemical energy (carbohydrate). In the presence of carbon dioxide and water. Hence they are known as autotrophs. All the other biotic components of the ecosystem depend directly or indirectly on the producers for their food.

Examples : plants, algae and bacteria.

Consumers:

- Consumers are animals, they are also known as heterotrophy, they also not capable of producing their own food.
- They found directly or indirectly on producers for their food.
- Examples : animals, protozoa etc.

Decomposers:

- Decomposers are also heterotrophs. They depend upon dead organic matter for their food. They include micro-organisms like bacteria and fungi.
- Some protozoas and earthworms use dead organic matter as their food. They are also classified as decomposers.

ENERGY FLOW IN THE ECO-SYSTEMS:

- Energy is the capacity to do work. All the energy ultimately comes in to the sun, solar energy is transformed to chemical energy in the process of photosynthesis in the green plants.
- Primary production energy is available to the herbivores. Herbivores use sizable amount of this energy their own metabolism such as respiration, reproduction etc.

ECOLOGICAL SUCCESSION :

- A community is made up of may population. Population of a community interacts between themselves and influences the development of new community over time.
- Ecological succession includes systematic , directional. Orderly occurring in the physical environment of a community to the establishment of a stable community.
- A community is the product of environment in which it develops the community changes simultaneously the community changes, thus the community always remains in dynamic state.
- Now new organisms that are better development for life in the changed environment replace the cold. Gradually the whole community is replaced till a relatively stable community is formed.
- There are two types of succession found.

1. Primary succession
2. Secondary succession

Primary succession :

Succession on sterial areas like newly exposed sea , rock surface , etc is called primary succession. It takes more than 1000 years to develop a stable community by primary succession.

Secondary succession:

- The succession on a side from which well established community was destroyed and again the succession starts is called secondary succession.
- It takes less time than primary succession.

FOOD CHAINS, FOOD WEB, ECOLOGICAL PYRAMIDS:

Food chains:-

- The living world sustain on food and therefore it depends on food organism food not only contains energy but also materials needed by the organisms. In a ecosystem , there is flow of energy and circulation of materials among its members. Therefore the different plants and animals in an ecosystem are linked to each other for food. A food chain consists of a group of organisms in which there is transfer of food energy through a series of repeated eating and being eaten up food is obtained by the producers (green plants) from the solar energy and comsumed by different groups of consumers.
- Thus transfer of food energy from the source through a series of organisms that is consumers with repeated stages of eating and being eaten is termed as food chain.
- Depending on the types of food the consumers take up there are three types of food chain

i. Grazing food chain

ii. Saprophytic food chain

ii. Parasitic

Grazing food chain:-

The name of the food chain accomplished that the green plants grasses etc are being grazed by herbivores and on to the carnivores. Grass land , forest , ponds etc. follow this food chain depends on autotrophic energy capture.

Example:-

Saprophytic food chain:-

It starts from dead organic matters (dead animals, plants etc). Bacteria ,worms ,fungi etc. the ecosystems follows this food chain which depend on the solar energy but depends on the organic matter produced in other systems.

Example:

Parasitic food chain:-

It is a food chain in which parasitic like on the whole body to get energy. This food chain also starts from the green plants and animals to parasitic microbes.

Food web:-

- Web means network such as spiders web. The inter connection of different individuals food chain through different types of organism is called a food web.
- In other word, a food web consists of a number of linear food chains.
- In a food web , it is seen that some consumers feed on a single species and most consumers have also multiple food sources.
- Food web shows the pattern of energy flow among biotic community and abiotic community of the eco-system.
- Deserts occupy 1/5thof the earth surface important deserts are great western desert of USA Kalahari and Sahara of Africa. The climate is extremely hot in day time and the nights are very cold.

Ecological pyramids:-

- The various modes of nutrients of animals occupied different trophic levels which can be shown by means of an ecological pyramid.
- In such a pyramid it can be marked that the number of individuals which are producer are individually more numbers than the consumers and these in term are associated with further secondary consumers.

The ecological food pyramids are of three types such as

a) Pyramid of number
b) Pyramid of energy
c) Pyramid of bio-mass

a. Pyramid of number

In the pyramid of number , the number of individuals decreases at each trophic level. b. Pyramid of energy

In the pyramid of energy there is a decreases of energy availability at a successive trophic level.

c. Pyramid of bio-mass

The pyramid of biomass indicates a decreases in total amount of living organisms from lower to higher trophic level.

INTRODUCTION, TYPES, CHARACTERISTIC FEATURES, STRUCTURE AND FUNCTION OF THE FOLLOWING ECO SYSTEM:

An ecosystem, a term very often used in biology, is a community of plants and animals interacting with each other in a given area, and also with their non-living environments. The non-living environments include weather, earth, sun, soil, climate and atmosphere.

Types of Ecosystem

There are very many types of ecosystems out there, but the three major classes of ecosystems, sometimes referred to as 'biomes', which are relatively contained, are the following:

- **Freshwater Ecosystems**
- **Terrestrial Ecosystems**
- **Ocean Ecosystems**

Characteristic features

- (1) The ecosystem is a major structural and functional unit of ecology.
- (2) The structure of an ecosystem is related to its species diversity; the more complex ecosystems have high species diversity.
- (3) The function of the ecosystem is related to energy flow and material cycling through and within the system.

- (4) The relative amount of energy needed to maintain an ecosystem depends on its structure. The more complex the structure, the lesser the energy it needs to maintain itself.
- (5) Ecosystems mature by passing from less complex to more complex states. Early stages of such succession have an excess of potential energy and a relatively high energy flow per unit biomass. Later (mature) stages have less energy accumulation and its flow through more diverse components.

Ecosystem Structure

Each ecosystem has two main components:

1. Abiotic Components

The non-living factors or the physical environment prevailing in an ecosystem form the abiotic components. These are Climatic Factors that include rain, temperature, light, wind, humidity etc. and Edaphic Factors including soil, pH, topography minerals etc.

2. Biotic Components

The living organisms such as plants, animals and micro-organisms (Bacteria and Fungi) that are present in an ecosystem form the biotic components.

The biotic components can be further grouped into two basic components from the nutrition point of view:

(i) Autotrophic components, and

(ii) Heterotrophic components

The autotrophic components include all green plants which fix the radiant energy of the sun and manufacture food from inorganic substances. The heterotrophic components include non-green plants and all animals which take food from autotrophs.

Producers: Among biotic components, at a basic functional level, ecosystem generally contains primary producers (plants) capable of harvesting energy from the sun through the process called photosynthesis. This energy then flows through the food chain.

Consumers: After producers, next come consumers in the ecosystem. There are different classes or categories of consumers; these consumers feed on the captured energy.

(a) Consumers of the first order or primary consumers (herbivores): herbivorous are animals that are purely dependent for their food on producers or green plants. Insects, rodents, rabbit, deer, cow, buffalo, goat are some of the common herbivores in the terrestrial ecosystem and small crustaceans, mollusks, etc. in the aquatic habitat.

(b) Consumers of the second order or secondary consumers (carnivores): These are carnivores and omnivores. Carnivores are flesh-eating animals, and the omnivores are the

animals that are adapted to consume herbivores as well as plants as their food. Secondary consumers are sparrow, crow, fox, wolves, dogs, cats, snakes, etc.

(c) Consumers of the third order or tertiary consumers: These are the top carnivores that prey upon other carnivores, omnivores and herbivores. Lions, tigers, hawk, vulture, etc. are considered as tertiary or top consumers.

(d) Parasites, scavengers and saprobes are also included in the consumers that utilize living tissues or dead remains of animals and plants as their food.

Decomposers: Decomposers work at the bottom of the food chain. Dead tissues and waste products are produced at all levels. Scavengers, detritivores (animals that live on the detritus of ecosystems) and decomposers not only feed on this energy but also break organic matter back into its organic constituents. It is the microbes that finish the job of decomposition and produce organic constituents that can again be used by producers.

The energy that flows through the food chain, i.e., from producers to consumers to decomposers is always inefficient. That means less energy is available at secondary consumers level than at primary producers level. It's not surprising, but the amount of energy produced from place to place varies a lot due to the amount of solar radiation and the availability of nutrients and water.

Function of Ecosystem

An ecosystem is a discrete structural, functional and life-sustaining environmental system. The functional components in any ecosystem are:

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

(ii) **Organisms** (plants, animals and microbes), and

(iii) **Energy** which other components receive from outside (the sun).

These three form an environmental system and interact with each other. Inorganic constituents are synthesized into organic structures by the green plants (primary producers) through photosynthesis utilizing the solar energy in the process. Green plants become the source of energy for renewals (herbivores), which, in turn, become a source of energy for the flesh-eating animals (carnivores).

All types of animals grow by adding organic matter to their body weight, and complex organic compounds taken as food is their source of energy. They are known as secondary producers.

All the living organisms 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 like bacteria, fungi and many other animals. The saprobes finally decompose the organic structure and break the complex molecules and liberate the inorganic components into the environment.

FOREST ECOSYSTEM:-

Forest ecosystem is one of the greatest ecosystem of terrestrial ecosystem whose boundary of the habitat may be as large as a sub-continent of even a continent. The ecosystem may by as follows.

i. Tropical rain forest:-

The forest area is thick with maximum diversity and about 200 species of trees are found per hectres. It contains more than half of the earth flora and fauna. The tallest trees may reach a height up to 50m and from the upper canopy.

ii. Temperature grass land:-

These are located in USA, Canada ,south America ,Asia and Africa. The annual rainfall ranges between 25-75 cm various types of grasses extending from 15 cm to 250 cm in height grow in these areas. These grassland provides natural habitats for grazing animals like zebra, horse, rabbit etc.

iii. Desert eco-system :-

Reason with less than 25 cm of annual rainfall is deserts. The rain are uncertain and may not occur even for years.

AQUATIC ECO-SYSTEM (PONDS, STREAM, LAKES, RIVERS, OCCEAN, ESTUARIES):

Aquatic eco-system :-

Aquatic eco-system deals with biotic community present in water bodies. In terrestrial ecosystem carbon dioxide and oxygen are present in gaseous form where as in aquatic eco-system. These are available in dissolves state. Depending upon the aquatic and nature of water. The aquatic eco-system is of two types.

Fresh water
ecosystem. Marine
eco-system

POSSIBLE SHORT TYPE QUESTIONS WITH ANSWER

What is Ecosystem? [W-16,19,20]

Ans. The living Organisms of an area (habitat) and their non-living environment function together as one unit is called the ecological system on ecosystem.

Define the term ecology. [W-17]

Ans. The term ecology has been derived from two Greek words. Oikos & logos. Oikos means house & logos means study . Broadly speaking ecology is the study of the house hold of the Planet earth. The house hold consists of non-living (abiotic) and living (biotic) Organisms.

What is the synecology? [W-18]

Ans. The branch of ecology dealing with the relation communities and their environments.

Define Food Chain & Food web. [S-18,W-19]

Ans. The transfer of food energy from plant sources through a services of organisms in ecosystem is known as Food Chain.

Food web: In nature the food chain relationship is very complex. Each Organisation feed on two or more kinds and in turn eaten up by several other kinds of organisation. When this is represented through a diagram the relationship appear as a branching lines, other than single lines. This is called Food web.

Define Autoecology. [W-18]

Ans. The branch of ecology that deals with the biological relationship between an individual Organisms or an individual species and its environment.

What is ecological succession ?[W-21]

Ans.- ecological succession, the process by which the structure of a biological community evolves over time. Two different types of succession-primary and secondary.

Define producer in eco-system. [W-22]

Ans.- Producers are organism that make their own food. They are also known as autotrophs. they get energy from chemical or the sun and with the help of water and convert that energy into usable energy in the form of food.
Ex-plant

POSSIBLE LONG TYPE QUESTIONS

Q.1 Explain the function of food chain & food

web. [W-16] Explain the different components of an

ecosystem. [W-16] Describes the Ponds as an ecosystem.

[W-16]

Explain three general types of ecological Pyramids. [W-

17,19] Explain the structure of an ecosystem. [W-17]

How food chain is different from food web. [W-17]

Explain, the structure & characteristics of pond eco-system.[W-18,20]

Q.8.Define & explain food chain with at least one example.[W-21]

Q.9.Describe forest ecosystem.[W-21]

Describe aquatic eco-system.[W-22]

Write short notes on pyramid of energy.[w-22]

UNIT - 4

BIODIVERSITY AND IT'S CONSERVATION

Learning objective

- *Introduction-Definition: genetics, species and ecosystem diversity*
- *Biogeographically classification of India.*
- *Value of biodiversity: consumptive use, productive use, social ethical, aesthetic and option values.*
- *Biodiversity at global, national and local level.*
- *Threats to biodiversity: Habitats loss, poaching of wild life, man wildlife conflicts.*

INTRODUCTION- DEFINITION: GENETIC, SPECIES ECOSYSTEM DIVERSITY:

Definition of Biodiversity:

Biological diversity or biodiversity is that part of nature which includes the differences in genes among the individuals of a species ,the variety and richness of all the plant and animal species at different scales in space ,locally ,in a region ,in the country and the world ,and various types of ecosystems ,both terrestrial and aquatic within a defined area .

What is biodiversity?

Biological diversity deals with the degree of nature's variety in the biosphere . This variety can be observed at three levels ; the genetic variability within a species , the variety of species within a community , and the organisation of species in an area into distinctive plant and animal communities constitutes ecosystem diversity.

Genetic diversity:

Each member of any animal or plant species differs widely from other individuals in its genetic makeup because of the large number of combinations possible in the genes that give every individual specific characteristics .Thus ,for example , each human being is very different from all others .This genetic variability is essential for a healthy breeding population of a species. The diversity in wild species forms the " gene pool " from which our crops and domestic animals have been developed over thousands of years. Modern

biotechnology manipulates genes for developing better types of medicines and a variety of industrial products .

Species diversity :

The number of species of plants and animals that are present in a region constitutes its species diversity .This diversity is seen both in natural ecosystems and in agricultural ecosystems .Some areas are more rich in species than others .Natural undisturbed tropical forests have a much greater species richness than plantations developed by the forest department for timber production .A natural forest ecosystem provides a large number of non-wood products that local people depend on such as fruit ,fuel wood , fiber , gum ,resin and medicines . Modern intensive agricultural eco systems have a relatively lower diversity of crops than traditional agropastoral farming systems where multiple crops were planted . At present conservation scientists have been able to identify and categorise about 1.8 million species on earth . Areas that are rich in species diversity are called “hotspots” of diversity .India is among the world’s 15 nations that are exceptionally rich in species diversity .

Ecosystem diversity :

There are a large variety of different ecosystems on earth , which have their own complement of distinctive inter linked species based on the differences in the habitat. Ecosystem diversity can be described for a specific geographical region , or political entity such as a country , a state or a taluka . Distinctive ecosystems include land scapes such as forests ,grasslands ,deserts , mountains ,etc . , as well as aquatic ecosystems such as rivers ,lakes ,and the sea .Each region also has man-modified areas such as farmland or grazing pastures .

An ecosystem is referred to as “natural” when it is relatively undisturbed by human activities .Ecosystems are most natural in wilderness areas . If natural ecosystems are overused or misused their productivity eventually decreases and they are then said to be degraded .

India is exceptionally rich in its ecosystem diversity .

BIOGEOGRAPHICALLY CLASSIFICATION OF INDIA :

Our country can be conveniently divided into ten major regions ,based on the geography ,climate and pattern of vegetation seen and the communities of mammals ,birds ,reptiles , amphibia , insects and other invertebrates that live in them .Each of these regions contains a variety of ecosystems such as forests ,grasslands , lakes ,rivers ,wetlands ,mountains and hills ,which have specific plant and animal species .

India ‘s Biogeographic Zones :

1. The cold mountainous snow covered Trans Himalayan region of Ladakh .

2. The Himalayan ranges and valleys of Kashmir ,Himachal Pradesh ,Uttarakhand , Assam and other North Eastern states .

3. The Terai ,the lowland where the Himalayan rivers flow into the plains .

4. The Gangetic and Bhramaputra plains .

5. The Thar Desert of Rajasthan .

6. The semi arid grassland region of the Deccan plateau Gujarat ,Maharashtra , Andra Pradesh , Karnataka and Tamil Nadu .

7. The Northeast states of India .

8. The Western Ghats in Maharashtra ,Karnataka and Kerala .

9. The Andaman and Nicobar Islands .

10. The long western and eastern coastal belt with sandy beaches ,forests and mangroves .

VALUES OF BIODIVERSITY: CONSUMPTIVES USE , PRODUCTIVE USE, SOCIAL, ETHICAL, AESTHETIC & OPTION VALUES:

Value of Biodiversity :

Environmental service from species and ecosystems are essential at global ,regional and local levels . production of oxygen ,reducing carbon dioxide ,maintaining the water cycle ,protecting soil are important services . The world now acknowledges that the loss of biodiversity contributes to global climatic changes .The preservation of "biodiversity" is therefore integral to any strategy that aims at improving the quality of human life

Consumptive use value:-

The direct utilisation of timber ,food ,fuelwood ,fodder by local communities .
The biodiversity held in the ecosystem provides forest dwellers with all their daily needs ,food ,building material ,fodder ,medicines and variety of other products .They know the qualities and different uses of wood from different species of trees ,and collect a large number of local fruits ,roots and plant material that they use as food , construction material or medicines .

Productive use value:-

Marketable goods

Value of MFP > Timber (which is part of sustainable use)

The biotechnologist uses biorich areas to "prospect" and search for potential genetic properties in plants or animals that can be used to develop better varieties of crops that are used in farming and plantation programs or to develop better livestock . To the pharmacist ,biological diversity is the raw material from which new drugs can be identified from plant or animal products .

Social values :-

While traditional societies which had a small population and required less resources had preserved their biodiversity as a life supporting resource ,modern man has rapidly depleted it even to the extent of leading to the irrecoverable loss due to extinction of several species .Thus apart from the local use or sale of products of biodiversity there is the social aspect in which more and more resources are used by affluent societies . The biodiversity has to a great

extent been preserved by traditional societies that valued it as a resource and appreciated that its depletion would be a great loss to their society .

- **Ethical and moral values :-**

  Ethical values related to biodiversity conservation are based on the importance of protecting all forms of life . All forms of life have the right to exist on earth . Man is only a small part of the Earth's great family of species .Don't plants and animals have an equal right to live and exist on our planet which is like an inhabited spaceship ? We do not know if life as we know it exists else-where in the universe .Do we have the right to destroy life forms or do we have a duty to protect them ?

  Indian civilization has over several generations preserved nature through local traditions .

- **Aesthetic value :-**

  Knowledge and an appreciation of the presence of biodiversity for its own sake is another reason to preserve it .Quite apart from killing wildlife for food ,it is important as a tourist attraction . Biodiversity is a beautiful and wonderful aspect of nature .Sit in a forest and listen to the birds .Watch a spider weave its coplex web .Observe a fish feeding .It is magnificent and fascinating .

  Symbols from wild species such as the lion of Hinduism ,the elephant of Buddhism deities such as lord Ganesh , and the vehicles of several deities that are animals ,have been venerated for thousands of yeras .

- **Option value:-**

  Keeping future possibilities open for their use is called option value .It is impossible to predict which of our species or traditional varieties of crops and domestic animals will be of great use in the future . To continue to improve cultivars and domestic livestock , we need to return to wild relatives of crop plants and animals .Thus the preservation of biodiversity must also include traditionally used strains already in existence in crops and domestic animals .

BIODIVERSITY AT GLOBAL ,NATIONAL AND LOCAL LEVELS

- There are at present 1.8 milion species known and documented by scientists in the world .However , scientists have estimated that the number of species of plants and animals on earth could vary from 1.5 to 20 billion ! Thus the majority of species are yet to be discovered .
- Most of the world's bio-rich nations are in the South ,which are the developing nations. In contrast ,the majority of the countries capable of exploiting biodiversity are Northern nations ,in the economically developed world .These nations however have low levels of biodiversity .Thus the developed world has come to support the concept that biodiversity must be considered to be a "global resource " .However ,if biodiversity should form a "common property resource " to be shared by all nations ,there is no reason to exclude oil ,or uranium , or even intellectual and technological expertise as global assets .India's sovereignty over its biological diversity change in world thinking about sharing of all types of natural resources .
- Countries with diversities higher than India are located in South America such as Brazil ,and South East Asian countries such as Malaysia and Indonesia . The species found in these countries ,however are different from our own .
- Throughout the world ,the value of biologically rich natural areas is now being increasing appreciated as being of unimaginable value .

- India has also signed the convention in the trade of Endangered species (CITES) which is intended to reduce the utilization of endangered plants and animals by controlling trade in their products and in the pet trade .

THREATS TO BIODIVERSITY : HABITAT LOSS , POACHING OF WILDLIFE ,MAN-WILD-LIFE CONFLICTS :

- Man has begun to overuse or misuse most of these natural ecosystems .Due to this "unsustainable" resource-use ,once productive forests and grasslands have been turned into deserts and wasteland have increased all over the world .Mangroves have been cleared for fuelwood and prawn farming ,which has led to decrease in the habitat essential for breeding of marine fish . Wetlands have been drained to increase agricultural land .These changes have grave economic implications in the longer term .
- The current destruction of the remaining large areas of wilderness habitats ,especially in the super diverse tropical forests and coral reefs ,is the most important threat worldwide to biodiversity . Scientists have estimated that human activities are likely to eliminate approximately 10 million species by the year 2050.
- There are about 1.8 million species of plants and animals , both large and microscopic ,known to science in the world at present .The number of species however is likely to be greater by a factor of at least 10 .plants and insects as well as other forms of life not known to science are continually being identified in the worlds' "hotspots" of diversity .The loss of wild habitats due to rapid human population growth and short term economic development are major contributors to rapid global destruction of biodiversity .
- Island flora and fauna having high endemism in small isolated areas surrounded by sea have so far been most seriously affected by human activity , which has already led to extinction of many island plants animlas (the dodo is a famous example) .Habitat loss also results from man's introduction of species from one area into another ,disturbing the balance in existing communities .In the process ,the purposely or accidentally introduced organisms (Eupatorium ,Lantana ,Hyacinth ,congress grass or Parthenium) have led to the extinction of many local species . Loss of species occurs due to the destruction of natural ecosystems ,either for conversion to agriculture or industry , or by over-extraction of their resources ,or through pollution of air ,water and soil .
- In India, forests and grasslands are continuously being changed to agricultural land .Encroachments have been legalized repeatedly .Similarly natural wetland systems have been drained to establish croplands resulting in loss of aquatic species .
- Our natural forests are being deforested for timber and replanted using teak ,sal or other single species for their timber value .When excessive firewood is collected from the forest by lopping the branches of trees the forest canopy is opened up and this alters local biodiversity .
- Increasing human population on the fringes of our protected areas degrade forest ecosystems .Overharvesting of fish especially by trawling is leading to serious depletion of fish stocks .Turtles are being massacred off the coast of Orissa .The rare whale shark ,a highly endangered species ,is being killed off the coast of Gujarat .
- **Poaching of wild life :** Specific threats to certain animals are related to large economic benefits .Skin and bones from tigers ,ivory from elephants , horns from rhinos are extensively used abroad .Bear are killed for their gall bladders . Corals and Shells are also collected for export or sold on the beaches .The commonly collected plants include Rauvolfia ,Nuxvomica Datura ,etc. Collection of garden plants includes orchids ,ferns and moss

POSSIBLE SHORT TYPE QUESTIONS WITH ANSWER

Q.(1) Define the term "Biodiversity".[2017-w new]

ANS-Biodiversity refers to the occurrence of diverse forms of plant and animal life in a particular area under a set of environmental conditions .It denotes the variety, number and the way of living organisms .The totality of genes ,species and ecosystems of a region is called biodiversity .

Q.(2)What are hotspots of biodiversity ?[2018(w)-new]

ANS-Hotspots are areas that are extremely rich in species ,have high endemism and are under constant threat .

Define genetic and species.[W-21]

Ans. the variation of genes within the same species is called genetics & the no. of verities in an area is called species.

What do you mean by poaching of wild life. [W-22]

Ans. poaching of wild life means an illegal hunting or capturing of wild animal. it is associated with crime against wild life. its results in a depletion of certain species of wild life. those animal are killed which possess something valuable.

Q5.What is endangered species.[W-22]

Ans. An endangered species is a type of organism that is threatened by extinction. Species becomes endangered foe two main reasons-

i)loss of habitat.

ii)loss of genetics variation.

POSSIBLE LONG TYPE QUESTION

Q.(1) Explain about Biodiversity at Global National and Local level ? [W-16] Q.(2) What are the major threats to biodiversity ? [W-17]

Q.(3) Briefly explain about ex-situ conservation of biodiversity.[W-18]

Q.(4) Write notes on endangered and endemic species. [W-18]

Q.(5) Give a comparison between ex-situ and in-situ conservation of bio-diversity.[W- 18]

Explain different threats to biodiversity.[W-21]

Explain biodiversity of national level.[W-

21]

Give a brief description of man-wild life conflit.[W-22]

UNIT-5

ENVIRONMENTAL POLLUTION

Learning objectives

Definition Causes, effects and control measures of:

a) Air pollution.
b) Water pollution.
c) Soil pollution
d) Marine pollution
e) Noise pollution.
f) Thermal pollution
g) Nuclear hazards.

Solid waste Management: Causes, effects and control measures of urban and industrial wastes.

Role of an individual in prevention of pollution.

Disaster management: Floods, earth quake, cyclone and landslides.

DEFINITION CAUSES , EFFECT & CONTROL MEASURE OF :

Definition of pollution

- When something destroyed its purity and making foil or filthy is known as pollution.
- When something destroyed its purity and that is un useful for the purpose of use is known as pollution.

a) AIR POLLUTION

Definition

When the harmful substances mixing with the air it turn in to impurities and that impurities in air is known as air pollution.

Contamination of air is known as air pollution.

Causes of air pollution

It is of two types.

- Natural
- Manmade

Natural pollutant

- The harmful gases substances produced during forest fire , volcanic eruption etc.
- Volcanic eruption release poisonous gases like SO_2 ,H_2S, and CO etc. When these gases mixing with naturally with atmosphere and release to the air making foil and injurious to air health.

Manmade pollutant

1. These are the major causes of pollution. They are

   - Increasing in population
   - Deforestation
   - Emission from vehicles
   - Burning of fosil fuels
   - Rapid industrialisation
   - Agricultural activities
   - Wars

1. Increasing in population

The reasons of population increasing are

- Increasing birth rate
- Decreasing death rate

Due to the development of science and technology today people are living longer , people don't die . this is the main cause to pollutant the air.

2. Deforestation

- Plant maintain balance of CO_2 and O_2 in nature , as they purity air by taking CO_2 gas for photosynthesis and liberating O_2 is to be utilized by animal for respiratory activities.
- The animal again liberated CO_2 gas which is used by plant.
- Deforestation and indiscrimination cutting of trees and clearing of forest by man for its won feed has disturbed the balance of CO_2 and 0_2 in the nature.
- This is caused an increasing CO_2 and decrease in O_2 construction of the atmosphere.

3. Emission from vehicles

Air pollutant such as carbon monoxide ,nitrogen oxide, particulate matter and benzene are emitted in to the environment by motor vehicles.

4. Burning of fosil fuel

- About 97% of the energy we use in our home and factories is generated by coal ,oil ,natural gases which are called fossil fuel. When it burns some poison gases such as CO, CH_4, SO_2, etc which known as polluted air.

5. Rapid industrialisation

- A large no of industries like chemical industries , paper mill , cotton mill , metallurgical industries ,petroleum refineries etc are responsible for 20% of air pollutant are CO_2 , CO,SO_2, H_2S, NO_2, CH_4 etc.

6. Agricultural activities

- Different types of pesticides ,insecticides, herbicides, fungicides, and biocides are used in modern agricultural practices. Some amount of these toxic chemicals are carried by wind to different places during their spray there by polluting air.

7. Wars

- Air pollution is caused by various types of sophisticated explosive used by modern war fair.
- Radio active elements are released as freely by products during atomic explosions testing of nuclear and atomic reactors.
- These radioactives dust which fall on the earth after atomic explosion is called radio active fall out.
- These include strontium-90, iodine-131, calcium-137, these element enter to the food chain and get concentrated in human body causing hazards.

Effects of air pollution Effect on plant

- Air pollution has serious effect on plants.
- So_2 causes chlorosis resulting death of cell and tissues.
- H_2O Hydrocarbon causes premature fall of leaves and flowers buds and discolouration of sepals or petal.
- Fluorides damage leaf, vegetables , lettuce, spinach, etc. Fluorides and oxides of nitrogen reduce crop field.

Effects on animal

- Air pollution causes wild spared damage to live stock. The effect of air live pollution on domestic animal living in our industrial area ingests calcification of bones and teeth.
- It result in lame loss, loss of weight frequent diarrheal.

Effect on man

- Sulphur trioxide , nitrogen oxide , carbon monoxide , defuse in the bloods they combine with haemoglobin and reduce its oxygen carrying capacity.
- Hydrocarbons have been reported cause cancer in man.
- Cadmium causes high blood pressure and number of heart diseases.

Control measures of air pollution

- Scrubers are used to remove gases and vapours.
- Electro static persipitator is used to power plant to check emission of dust from fuel gases.
- Cyclone collector are used to remove nearly 75% of particles from wastage gas.
- Trees should be planted on the road sides and in the open places to keep environment fresh , clean purity the air.
- Pollution control laws including motor vehicles act should be strictly enforced.
- Nuclear explosion banned.

b) WATER POLLUTION

- Water pollution is the contaminated water.
- Water is said to be polluted, when it is contaminated with some harmful substances that provide hazardous for human life.
- In simple term “contaminated water unsuitable for human purpose is polluted water.
- Water pollution occurs in water bodies such as ponds , rivers, lakes ,seas etc and it is mostly ,manmade.
- Water pollution occurs due to addition of toxic chemicals, petrochemicals , pesticides , hot sewage, radio active substances etc.
- It may be defined as adverse change in the quality of water to such an extend that it becomes unsuitable for the purpose of uses.
- When water bodies are polluted the aquatic lives are seriously affected and also terrestrial animal.

There are two types of water pollution

- Point source pollution
- Non point source pollution

Point source pollution

This source of pollution can be radialy identified because it has a definite source and place where it enters to the water.

Ex- municipal sewage, industrial discharge pipes.

Non point source pollution

When a source of pollution can not be readily identified such as agricultural runoffs, acid rains etc.

Causes of water pollution

Some of the following sources of water pollution are mentioned below

- Thermal pollution
- Industrial effluents
- Agricultural practices

- Sewages
- Oil spoils
- Silt pollution
- Radioactive wastes etc

Thermal pollution

- Various industries processes utilized a lot of water for cooling purposes. The hot water discharge is runoff in to near by water bodies and increase this temperature. This reduces dissolved oxygen content and adversely affect rate of metabolism of animal and plants and it also microorganisms and it also losses the properties of water as a result the qualities of the water remain changed and turn it into contaminated.
- The suspended pollutants settle at the bottom to form sludge.
- In the liquid part potassium , ammonium ,magnesium, phosphates, carbonates, sulphatesetc also present. Besides it many micro organisms are also present that causes disease like typhoid, amoebic dyscentry, hepatitis.

Agricultural practices

- For increased agricultural productivity we use in organic fertilizers ,pesticides ,insecticides, herbicides, are used.
- Nitrates of inorganic fertilizers are carries to ground water by leatching and finally reach surface water. These compounds when consumed by animals combine with haemoglobin reduce oxygen carrying capacity.

Industrial effluents

- The waste water of heavy industries such as petrochemicals fertilizers , oil refineries, textiles , etc are usually delivered wastes in to near by rivers, springs , lakes etc.
- The toxic pollutants expelled are metals like copper, lead , mercury , petroleum , acids , carbonates , cyanides alcohols, chlorides etc.
- Most of them are non degradable and toxic wars which may be lethal for aquatic animals.
- Sometimes the effluents content heated materials with raises the temperature of water causing drastic ecological change.

Oil spoils

After exploring the land man has recently moved to coastal waters for drilling of fossil fuels.

This causes large amount of crude oils leaking in to the sea water and floating on the water surface of the seas. Such divesting the marie life.

Radioactive wastes

Radioactive wastes dumped in to oceans from nuclear installation , it contaminates the marine lives. These radio isotopes finally reach man through food chain.

Sewages

Municipal sewage is a major source of water pollution in the rise in population leads to rise in the production of wastes. Sewage contain sizable quantity of decomposer organic matter causing a change in the dissolved oxygen liable of water to which it is drained.

Effects

- Water born epidemics like cholera, typhoid, discentry , hepatitis ,jaundice are due to bacterial, protozoan contamination.
- Some industries discharge effluents, sometimes effluents contain mercury. Mercury is a nerb poison it damage the brain and also responsible for vision impairments.
- Oxygen depletion –the dissolved oxygen of water bodies reduces due to thermal pollution causing respiration failure in animals.
- Alkali- alkali is liberated from chemical factories , cotton factories , tannery factories etc.
- When alkali mixed with the water it raises the alkalinity of water causing the destruction of micro-organisms and affects the gill of fish.
- Acids- battery manufacturing company electro pleting industries, lather and chemical industries produce several acids. These are corrosive in nature, and damage the pumps and pipes. Acids when mixed with sludge and mud produce hydrogen sulphide gas (H_2S), which is an air pollutant.
- Acidity destroyed micro-organisms who help for self purification of water. Acid is dangerous for fish and other aquatic animals.

Control

- Proper sterilization of drinking water should be made before it is supplied.
- Industrial effluents should be proper treated and neutralized and after discharged

c) SOIL POLLUTION :

Soil is one of the most precious natural resources, which provided habitat for all terrestrial animals and all land plants that thrive on the soil. The rock less human activity in polluting the soil of rural and urban areas is posing serious threat to human existence.

Causes of soil pollution

a) Domestic waste

It mainly contains old paper, packing glass and plastic bottles, broken porcelain ,polythene carry bags, vegetable wastes and garden wastes.

b) Municipal waste

Polythene, paper and sand donated from street scraping , plastic and organic wastes obtained from the cleaning of drains , waste metals and slaughter house wastes from the major part of municipal garbage.

c) Biomedical waste

Biomedical waste is defined as any solid or liquid or the container used for their storage ,which are meant for diagnosis ,treatment ,immunisation and biological testing in hospitals , laboratories diagnostic centres.

d) Agricultural waste

It includes mainly the fertilizers , pesticides, and fungicides used for the improvement of soil, nourishment of plants, control of insects and weeds.

e) Mining and quarrying

Earth's surface is dug open for lifting coal and minerals from the mines. There is serious damage to the top soil as a result of such mining operation.

After the mining operation is over ,empty mines are usually packed with sand and water.

f) Industrial waste

Industries emit a number of gaseous wastes like sulphur dioxide and nitric oxide. These gaseous pollutants produce sulphuric acid nitric acid in atmosphere and reach the soil through acid rain. This makes the soil acidic.

g) Radioactive waste

Radioactive waste from nuclear power plants, laboratories and nuclear explosion are dumped in the soil that contaminates the nearby area.

Effect of soil pollution

- Domestic, municipal and biomedical waste pose serious threat to human health besides polluting the soil may such waste like polythene carry bags and bottles are not bio degradable.
- They are not destroyed by the soil micro organisms and present in soil for long periods.
- Dumping of domestic sewage and biomedical wastes pollute the environment and pose a serious threat to human health.
- Through mining operations the underground minerals get mixed up with the top soil and when these ate oxidised by air and water the soil becomes toxic and unfit for cultivation.
- Acid rain changes the pH of the soil and soil becomes acidic. An acidic soil is most unproductive for agriculture.
- Radioactive wastes are capable of emitting radiation for a very long period this emitted radiation causes great damage to the plant and animals.

Control of soil pollution

- There must be an drainage system for safe disposal of all the mentioned wastes polluting the soil.
- There should be planned urbanization and industrialisation keeping in minds the safe use of land.

- The solid wastes are to be stored out to isolate the materials like plastic , paper and metals etc.
- There should be judicious use of fungicide, pesticides and weedicides.
- Biological pest control method should be tried in lieu of chemical control.
- The gaseous pollutants from the industries could be absorbed in to suitable absorbents by absorbent technique. By combustion process the emission of gaseous pollutants could be controlled.
- Steps should be taken for safe disposal of radioactive waste.

d) MARINE POLLUTION

- Ocean are polluted due to contaminates received from neighbouring inland and the settlements present along coastal lines.
- Major sources of marine pollution is the activities meant for development and maintenance of ports and harbours.
- Shipping activities are responsible for adding contaminates like cargo waste and human waste from ship board to ocean.
- Besides discharge from drains, effects from industries are added by marine water and get contaminated the marine water.
- These pollutants are gradually deposited in the sediments and gets discharged from time to time by webs.

Sources of marine pollution

- Accidental flow of crude oil in to the sea from the tanker during transport ,storage , distribution extraction etc.
- Plastic materials either intentionally disposed off or accidentally lost in the sea from sources like fishing nets, packing synthetic roobs, plastic bags , plastic bottles etc.
- Ash from fuels used in nuclear reactors are disposed off in the ocean which contains radio active substances like uranium, thorium and plutonium.

Effects

- Most of the micro organisms added through sewage are harmful pathogens causing serious marine animals.
- Hot water discharged from industries raises the water temperature and causes depletion in the dissolved oxygen content of water oxygen depletion causes death of marine organisms.
- Various chemicals heavy metals radio active materials enter in to the body of marine organisms get bio magnified. And enter into human body through sea food.
- Toxic substances also kill marine organisms.

Ex –olive riddle turtles.

Control

- Pre treatment of sewage and industrial before their disposed into sea and that is the best method of prevention.

- Last but not least environmental awareness about all the sources of pollution and their control majors is the best way to keep our ocean clean.

e) NOISE POLLUTION :

- Noise is “unwanted sound “ or as any undesired sound.
- When the sound becomes undesirable , unbearable or painfull, it termed as noise.
- Sound with an intensity of 0 to 100 DB (decibels) is pleasant to our ears but a sound with an intensity of more than 120 DB is irritating , causing discomfort to our ears and it is classified as noise.

Sources of noise pollution

a. Natural
b. Man made

a. Natural

Natural sound is due to cyclonic storms with high wind velocity , volcanic eruption , rains ,earthquakes etc.

b. Manmade

Manmade sources of noise pollution are transportation blowing horns from industries, blowing sirens from industry , blasting of dynamite , blasting of crackers, running of electric generators etc.

- When sound travels from one to another through a medium (air, water, gases) in the form of waves.
- No of waves produce per second is known as pitch.
- The strength or magnitude of the wave is known as amplitude.
- The unit of amplitude is decibels.

Effects

- Excessive noise makes people neurotic and leads to mental disorder , annoyance etc.
- The most acute and immediate effect of noise pollution is hearing impairment lead in to ordinary fatigue and may finally lead to deafness.
- Noise interfere with speech communication.
- Noise affects heart beat , blood pressure , breathing ,headache ,disturb in sleep.

Control of noise pollution

- Plantation of trees on both side of roads and highways to reduce the sound intensity of automobiles.
- Person who working in noise environment should cover their ears with ear-muffs.
- Use of loud speakers used to banned near hospital, school and college ,court and justice.
- Areas with in a radius in 100 mt from the above mention spots should be declared as silent zone.

- Central pollution control board has stipulated the following area wised permissible noise level during day and night.

Area	Daytime (6am-9pm)	Night time(9pm-6am)
Residential areas	55db	45db
Commercial area	65db	55db
Industrial area	75db	70db
Silent zone	50db	40db

F)THERMAL POLLUTION

Causes of thermal pollution

- Large quantity of cold water circulates in nuclear reactors, thermal power plants etc, for the purpose of cooling units.
- After absorbing heat from the plants, the temperature of the water becomes very high. This hot water is discharged to nearby water bodies such as ponds, lakes , rivers ,springs etc.
- Many industries such as petroleum refinery ,steel plants ,petrochemicals also discharged to the near by water bodies.
- This discharged hot water raises the water temperature by $8\text{-}10^0$ c of heat the water bodies also dissipate the water molecules.

Effects of thermal pollution

- High temperature reduces the level of dissolved oxygen in water. This affects the respiration of aquatic animals.
- Hot water destroy the self purification micro organisms. As a result the water turn in to pollution as a result it promotes the growth of bacteria and other pathogens.
- Hot water affects the reproductive cycle rate of dization and enzymical activities of aquatic animals.
- It changes the characteristics properties of water.
- Normal algal population is replaced by unwanted and harmful blue green algae.

Control

There should be provision for cooling towers and spray ponds to cool the water coming out the nuclear plant and thermal power plant and use it over and over again.

G)NUCLEAR HAZARDS

- In nature many radioactive substances do exist in soil and water emitting continuous radiation. Such radiation is known as background radiation.
- The level of this radiation is low and the existing plants and animals are unharmed by this radiation, because they have been adopted to such radiations. This radiation rather helps for the flexibility of their gene for improvement. iii.Increased radiation from atomic bomb blast or radioactive wastes is hazardous, because such radiations are called ionizing radiation.

- They remove electrons from atoms , joining with each other in a compound such ionizing radiations damage the DNA and the cells of the living body ,as they are composed of different chemical compounds.

Sources of radioactive pollution

a. Natural, occurring in nature.
b. Manmade, generated out of human activities.

a. Natural

- Radioactive minerals uranium-235, uranium-238, thorium-232, plutonium-239 are the minerals naturally occurring nature.

Cosmic ray

High energy particles reach surface as a result of cosmic radiations. Maximum number is found in the poles and minimum number is found at the equator.

- Radionuclide's

The radionuclides are in unstable state in the atmosphere. They are split up into smaller particles emitting energic radiation.

b. Manmade sources.

- **Nuclear power plants**

Accidental leakage of radioactive fuels from reactors and power plants causes great harm to all living bodies including man. The best example is the leakage at Chernobyl in soviet Russia

Radioactive wastes

USA dumps large amount of radioactive wastes from its reactors into seas of other countries.

Nuclear explosion

Explosion of atom bombs generate large amount of radio nuclides in the atmosphere. When it settles sown on earth , contaminates soil and water. It also enters into the human food chain through fish and milk.

Radio isotopes

They are used for treatment of diseases like cancer. They are also used in the laboratory experiments.

- Television and all phones are also other sources of electromagnetic radiation.

Effect of radioactive pollution

- It causes mutation in DNA leading to genetic disorder mutation in the adults may causes cancer or other abnormalities. Mutation in the egg cell leads to the birth of defective babies.
- When bone marrow is exposed body causing premature agency and cancer to radiation the person suffers from leukaemia(blood cancer).
- It burns the skin causing skin cancer.
- It damages uterus when the pregnant mother is exposed to radiations.

Control measures against radioactive pollution

- Man-made radiation can be checked source. Enough precaution and care should taken while using and disposing radioactive.
- Accident proof nuclear reactors are to be designed.
- Nuclear weapons and nuclear tests should be banned.

SOLID WASTE MANAGEMENT- CAUSES, EFFECT, CONTROL, MEASURE OF URBAN & INDUSTRIAL WASTE:

SOLID WASTE MANAGEMENT

- Virtually wastes arise from human activities. Wastes are though have no economic value, so they are thrown outside or discharged in to water bodies.
- Due population growth, urbanisation development of industries have contributed to generate of voluminous and many kinds of waste.
- Solid waste management is categorised in to two categories.
- One is urban waste (the waste arise from urban areas) another is industrial waste(the waste arise from industrial area)

Urban waste

The term urban waste applies to all those waste generated in urban areas.

It is a combination of household, commercial, industrial refuse, residential refuse, street refuse, offices refuse, plastic metals etc.

Effects of urban waste

In urban areas ,waste collection and disposal in the hand of civil bodies. But in certain part of city waste disposal is left to individual or local communities or waste may the street, which turn into garbage.

Control of urban waste

Some of the following steps should have taken for control of urban pollution.

a. Reuse of waste material.
b. Material recovery and recycling.

About 10 to 15 % urban waste are suitable for recovery and recycling.

Ex- waste generated by papers ,glass, card board, etc. Can be recycle for the same purpose i.e waste paper into new packing papers, card boards in to packing materials and broken glasses can be melted recast in to new bottles etc.

Industrial waste

Industries generate a wide range of waste materials such as general factory rubies, packaging materials , organic wastes etc.

Causes of industrial waste

- Integrated iron and steel mills-blast furnace slag (refuse left after ore has been melted)
- Coal based power plant –fly ash
- Cement factory—kiln dust
- Stone crusher—dust particles
- Aluminium phosphate plant—phospogypsum

Effects

The dust particles remain suspended in the air and when we inhaled causes all kinds of respiratory disorders.

Control

- Update technology to generate less waste.
- Use of available quality materials .
- Proper disposal in the industrial waste.
- Warning of harmful effects of waste to public etc.
- The uncollected dumped garbage , leads to many problems when exposed to wind and rain garbage becomes brooding ground for diseases carrying germs and patricides and it can causes serious health problems in individuals and the society.

ROLE OF INDIVIDUAL IN PREVENTION OF POLLUTION

- Individuals should minimize wastage of resources such as electricity. Every unit of electricity saved is equivalent unit of electricity produced as it not only saves the fuel that would be used to produce that electricity, but also help to prevent pollution that is accompanied by burning of that fuel. Therefore, person should always switch off appliances when not in use.
- Individuals should prefer walking or use cycles instead of using motor vehicles, especially when distances to be travelled are small.
- Individuals can make considerable contribution by using mass transport (buses, trains, etc) instead of using personal vehicles.
- When going to workplace, colleagues from nearby localities should pool vehicles instead of going in individual personal vehicles.
- Taking personal vehicles for periodic pollution checks at centres approved by authorities.

- Individuals should reuse items whenever possible.
- Products that are made of recycled material should be given preference.
- Use gunny bags made of jute instead of plastic bags.
- Take part in environment conservation drives such as tree planting drives.
- Use water resources efficiently.
- Use renewable resources by installing equipment such as solar heaters and using solar cookers.
- Dispose potentially harmful products such as cells, batteries, pesticide containers, etc properly.
- Use of refrigerators should be minimised wherever possible as they are main source of CFC, which is responsible for Ozone layer depletion.
- Follow and promote family planning, as more population means more resources utilized and more resources utilized imply more pollution.
- Avoid making noise producing activities such as listening to loud music.
- Use handkerchiefs instead of paper tissues.
- Organize drives to clean streets and clean drains with help of other people of locality.
- Spread awareness and inspire other people to prevent pollution. Individuals should be encouraged to acquire information and innovations from world over and implement them locally.

DISASTER MANAGEMENT – FLOOD , EARTHQUAKE, CYCLONE & LAND SLIDE:

Natural disasters

- Disasters often occurs ,all of a sudden and without warning. This result in description of normal life.
- The community gets affected in different ways. Causing damages to the life and properties of people.
- It disrupts essential services like water supply, sewage disposal and food supply.
- Basic infrastructural facilities like electricity, telecommunication transport by road and rail etc are also affected. People suffer from physical ,mental and emotion stress.
- In the basis of origin disaster is identified by classifying in to three major groups.
  a) Natural disaster
  b) Manmade disaster
  c) Ecological disaster

Natural disaster

Under this category the disasters are

i. Wind related -=-cyclone ,storm, tornado, tidal wave.
ii. Water related—flood, draught. iii. Earth related—earthquake, tsunami, volcanic eruption, land slides etc.

Manmade disasters

i. Fire household, industrial etc.

ii. Accidents, aircrafts ,train accidents , accidents of vehicles, sea collision etc. iii. Leakage –Gas cylinders leakage, leakage of ammonia. iv. Leakage of methane.

Ecological disaster

Ecological disaster include air pollution, water pollution , soil erosion, deforestation, marine pollution , soil pollution etc.

Flood

- Floods are natural phenomena characteristics of all rivers, flood occurs due to heavy rain fall.
- Along with heavy rainfall ,reduced capacity of river beds for drains of water , aggravate the flood situation.
- Due to heavy rain the banks of the rivers breakdown and water rushes into fields and human habits causing severe damage to livestock and human population and various vegetations.

Preparedness before the flood

- Flood forecasting and warning to public through mass media communication network like radio ,tv, news paper and public address system etc.
- Selecting safe and higher grounds near by to move after breach of flood wall.
- Construction and repair embankments by district administration.
- Diverting flood water to detention basins like lakes and swamps.
- Storage of emergency materials such as flash light, first aid , medicines home construction materials such as plastic sheets , bamboos and tarpaulins etc.
- Keeping farm animals vehicles and movable goods at safe places.
- Turning off gas and electricity while leaving.

During flood situation

- Listen to the radio for advance information and advice from govt.
- Never wander around the flood area.
- Don't enter flooded water on foot.
- If you can avoid it (to avoid snake bite and water born skin disease).
- If you are outdoors and the flood water rising, then stay on a high ground until flooded water recedes.

After flood

- Don't return home till authorities indicates it is said to return.
- Stay out of the house if flooded water remains around.
- Help your neighbours with surplus food ,clothing and construction materials.
- Learn from the calamity to remain fully for the next.

Earthquake

i. An earthquake is a sudden shaking of ground caused by disturbances in earths crust.

ii. It is considered to be one of the most dangerous and destructive natural calamities, it occur suddenly with little warning or no warning.

iii. Although it is not as frequent as other natural disasters.

iv. It can cause diver station and loss of live for greater than any other natural disaster. It is does not predict and cant be prevented.

Nature of earthquake

- It is in sudden.
- Causes destruction of buildings , infrastructure and agriculture.
- The magnitude of an earthquake is measured on rector from 1-9.
- The exact under ground split at which earth quake originates is called the focus and at the point of line vertically above the focus of the surface of the earth is known as epicentre of earth quake.
- The intensity of the earth quake decree as the distance from the epicentre decreases.
- When rock under ground suddenly breaks along a fault. This sudden release of energy is caused as seismic wave. That makes the ground shack.
- When two blocks of rocks or two plates are rubbing against each other they strike little. The spot under ground where the rock is breaks is called focus of the earthquake, the places right above the focus is called epicentre.

Land slide

Land slide is a general term for rapid down slope movement of soil or rock. There are sudden geomorphic events in sloping terrains. Gravity pulls downward on every material everywhere on earth, causing rapid to slow descent of soil ,rocks or other geological materials .the resulting movement is often slow and subtle but some slope processes such as rock slides , avalanches and land slumping can be swift and dangerous.

They often occur in conjunction with natural hazard like flood ,earthquake or volcanic eruptions.

Effects of land slides

- Land slides are more frequent and common in the Himalayan foot hill regions , caressing loss of life and property.
- Land slides pose serious threat to human settlements.
- They often result in heavy damage to highway , railways and waterways.

Cyclones

- The location and geometrical features of India makes it vulnerable to natural disasters. Tropical cyclone tops the list of natural disasters because of its magnitude of devastation causing loss of life and property.
- Cyclonic storms develops over the warn ocean water of the bay of Bengal and the Arabian sea. Cyclone that form in the bay of Bengal move into the Indian coastal line while those forming in the Arabian sea usually move away from Indian coastline and territory. However some of them may turn around to hit Gujarat and adjacent areas.

POSSIBLE SHORT TYPE QUESTIONS WITH ANSWER

Q -1 What is environmental pollution? [W-2017,2019]

Ans : environmental pollution refers to as any undesirable change in environment brought by chemical, physical and biological agencies. There are seven types of pollution which affect the environment desirable to undesirable such as air, water , thermal, noise, soil , nuclear hazards and solid wastes etc.

Q.2. What do you mean by rubbish and refuse? [S-2018] ,

Ans : Rubbish in the sense of crash waste is the same thing which comes from food waste. And refuse means to reject items which comes from the bathrooms and kitchen of a house like organic waste , cloths , paper products etc.

Write four psychological effect of noise pollution. [S-2018]

Ans : noise affects work efficiency

- That needs great deal of concentration •Disturb in sleep and work performance
- Heart beat and headache .

Define BOD and COD. [S-2018]

Ans: BOD stands for biological oxygen demand. BOD value means more polluted water. BOD is defined as the amount of oxygen required by bacteria to decompose the organic matters in to carbon dioxide and water under an aerobic condition.

COD: chemical oxygen demand. It measure to assess the amount oxygen present in water for oxidation of organic matter present in water.

What are hazardous waste? [2018-W –N]

Ans : Hazardous waste is waste that has substantial or potential threads to public health or the environment.

what is photo chemical smog? [2018-W-N]

Ans: smoke and fog together from smog nitrogen oxide and hydrocarbons are the pollutants from the automobile exhausts. In the presence of sunlight oxides of nitrogen and hydrocarbons reacts with one another to form ozone and peroxylacetyl nitrate. Nitrogen dioxide with ozone and PAN appear in the form of yellow brown smog, called photochemical smog.

What is solid waste management? [2019-W ,2020-W]

Ans : solid waste management is a term that is used to refer to the process of collecting and treating solid waste. It also affect solution for recycling items that do not belong to garbage or trash waste management is an about how solid waste can be changed and used as a value able resources.

Define green house effects. [2019-W,2020-W,2022-W]

Ans : carbon dioxide, methane , nitrous oxide , and CFC are together called green house gases. These gases from an enveloping layer in the atmosphere above the earth. Like glass war of a green house these gases allow sunlight to reach the earth surface and heat atmosphere. But they do not allow escape of heats from the earth in to space. The green house gases cause an increase of temperature in to the lower atmosphere. The warming action caused due to green house effect.

Define water pollution.[W-21]

Ans. Water pollution occurs when harmful substances—often chemicals or microorganisms—contaminate a stream, river, lake, ocean, aquifer, or other body of water, degrading water quality and rendering it toxic to humans or the environment.

Mention any two causes of marine pollution.[W-21]

ANS. Two major causes of marine pollution is

- Development and maintenance of port and harbours
- Shipping activities are responsible for adding contaminates like cargo waste and human waste.

Q.11-What is the unit of sound intensity[w-22]

Ans. The units of sound intensity is decibel(dB)

POSSIBLE LONG TYPE QUESTIONS

Discuss the effects of noise pollution. [2016-W-N]

What is water pollution? Discuss the causes and its remedies of water pollution? [2016-W –N]

Explain the sources of solid waste management. [2016-W,2022-

W,2020-W]Q-4 Write short notes on [2017-W-N]

i. Effects of air pollution

ii. Measures to check air pollution

Write an essay on 'Global warming'. [2017-W-N]

What are the impacts of industrial ligation of human environment? [2018-S-

N] Q-7 What are the hindrances in the development of nuclear power? [2018-S-N]

Explain the functions of cyclone separators and electrostatic precipitation withdiagram. [2018-S-N]

Explain the various steps employed for solid waste management. [2018-

S-N]Q-10 Write the hazards associated with radio active pollution. [2018-W-N]

Q-11 Explain the methods employed for control of noise pollution. [2018-W-N]

Q-12 What are effects of thermal pollution ? [2018-W-N]

Write the features of the Air pollution. [2018-W-N]

What are the methods employed for control of water pollution?[2018-W-N]Q-15

What is disaster management? [2019-W]

Q-16 What is solid pollution? Define the effects and control of measures of soil pollution in details? [2020-W]

Q.17. What is soil pollution ? describe causes, effects and control measures of soil pollution in details.[W-21]

Q18. Write short notes about urban problems related to

energy.[W-21] Q19. Explain cyclone disaster management.[W-21]

Q20. Write down the effects ,preventions and control of noise pollution[W-22]

UNIT-06

SOCIAL ISSUES AND THE ENVIRONMENT

Learning objectives

- *Form unsustainable to sustainable development.*
- *Urban problems related to energy.*
- *Water conservation, rain water harvesting, water shed management*
- *Resettlement and rehabilitation of people; its problems and concern*
- *Environmental ethics: issue and possible solutions*
- *Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies*
- *Air (prevention and control of pollution) Act.*
- *Water (prevention and control pollution) Act.*
- *Public awareness*

● UNSUSTAINABLE TO SUSTAINABLE DEVELOPMENT

The process by which people meet their needs and improve their living conditions is called development. Not only the present generation the future generation also benefit from economic, social, cultural and ecological sustainability. This is possible through conservation of natural resources and diversity of life.

Causes:

- The population explosion in recent years has put tremendous pressure on the environment. Mismanagement of environment and natural resources leads to unsustainable development.
- It is process of change in which the exploitation of resources , the direction of investments the orientation of technological development and institutional change are all in harmony and enhance both current and future potential to meet human needs.

● URBAN PROBLEMS RELATED TO ENERGY

- Energy is basic to development. Today life is unmanageable without energy. It provides not only comfort ,but also the necessities.
- Energy consumption for electric transportation ,cooking heating recreation and operating energy based machines.

- The urban life styles consumes more energy and necessities high utilization levels , for example , air conditioners are being used in place of electric fans ,scooters , motor cycles , cars have replaced bicycles , charcoal heaters have been replaced by electric geysers.
- It was some two hundred years ago with the dawn of industrial area the cities showed rapid development. No about 50 % of the world population live in urban areas and there is increasing movement of rural area to cities in search of employment.
- In developing countries too urban growth is very fast and in most of the cases it is uncontrollable and unplanned growth. In contact to the rural set up the urban is densely populated, consumes a lot of energy and materials and generates a lot of waste.

Energy problems in urban areas

- The pollutants released from vehicles reduce air quality. Burning of fossil fuels releases green housegases , which contributes to global warming.
- Severe power cuts affects health care services and public health care facility such as water supply , storage systems. The students appearing at examinations, patients in ICU are the most affected due to power cuts. Non availability of petrol and diesel severely affects public and private transport.

• WATER CONSERVATION, RAIN WATER HARVESTING AND WATERSHED MANAGEMENT.

- Water conservation is a key link between balancing current and future water needs. As pressure on this precious resource is growing day by day. The less water we withdraw , the loss we upset the natural balance. We can make significant contribution to solving the water crises by identifying the areas in home , office , business ,agriculture and industry where we waste water and then we can make appropriate chances in our water using habits.

Rain water harvesting:

- In addition to traditional water harvesting structure like tanks, and village ponds , a number of schemes have been devised based on the availability of water resources one such scheme is community based rain water harvesting.
- The principle of collecting and using precipitation from a catchment surface is the basis of rain water harvesting is enjoying of sorts in the world.

Water shed management :

- Present water storage
- Protects wildlife habitat
- Checks soil erosion
- Improve agriculture
- Minimize flooding
- Availability of water round the year
- Provide jobs for the local people
- Develop watershed for community use

RESETTLEMENT AND REHABILITATION OF PEOPLE IT PROBLEM & CONCERNS:

Its problems and concerns:

- It is a well known fact that both natural and human made disasters force people to moveout of their land. For example Tsunami in south Asia in December 2004 , Gujrat earthquake , the Odisha super cyclone and scores of floods and drought in other parts of our country have rendered thousands of people homeless and jobless.

People problems:

Strategics for rehabilitation of thus displaced people are in the first place by way of preventive action. For instance care is taken to build earthquake proof houses , gather advance information about cyclones and arrange for timely evacuation , build appropriate bunds in flood prove areas, maintains bridges that take regular up and down passing of trains or road transport vehicles on them in order to likely disasters. The primary necessity is that of building awareness among the people on general and among administrative personal in particular.

People concerns:

- Development projects come into existence after a fairly long period of planning and awareness of displacement caused by such projects already exists among those who initiate the projects.
- Development projects instead focus on economic efficiency and not on the who stands to lose all that they have their land means of livelihood and stable patterns of social and cultural life.
- As far as our country's preparation for coping with the impact of natural and we have began to feel a little aware of negative impacts of such events because they are now occurring at frequent intervals.

ENVIRONMENTAL ETHICS : ISSUES AND POSSIBLE SOLUTIONS-

- Ethics is defined as a set of rules or principles that are followed by a broadly recognized race or group. The field of environment ethics concerns human beings ethical relationship with natural environment. While numerous philosophers have written on this topic throughout history , environmental ethics only developed in to specific philosophical discipline in the 1970 s.
- Environmental ethics is a branch of applied philosophy that studies the conceptual foundations of environmental values as wells as more concrete issues surrounding, society attitudes , actions and policies to protect and sustain biodiversity and ecological systems.

Environmental issues:

- There are many environmental issues in India, Air pollution , water pollutions ,garbage and pollutions of the natural environment are all challenges for India . Nature is also causing some drastic effects on India. The situations was worse between 1947 through 1995.

- According to data collections and environment assessment studies of world banks experts between 1995 through 2010 , India has made some of the fastest progress in addressing its environmental quality in the world.
- Pollution remains a major challenge and opportunity for India.
- Environmental issues are one of the primary causes of disease , health issues and long term livelihood impact for India, Major environmental issues are use of resources , urban issue , vegetations , animal and birds , pollutions and population etc.

Possible solutions:

The following are the possible solutions

- **Conservation of natural resources:**
- Environmental goods are distributed in such a way that wealthy and otherwise privileged people enjoy the benefits of these environmental goods but poor or otherwise disadvantaged people bone their burden
- Forestation: forests play an important role on carbon cycle , main green house gas co_2 is absorbed by the forests.
- Forests can absorb many toxic gases and can help in keeping air cool.
- There is a need to grow more trees.
- The natural forests must be protected as national parks , where all the plants and animal can be protected.
- **Pollution control:**
- Forests cover should be protected.
- Trees are best controller of air pollution, noise pollution and soil pollution and soil erosion.

- **Population control:**
- Increasing population should be checked. It is our duty. One child concept should be adopted.
- **Solid waste management:**
- Reduction in use of raw material will correspondingly decrease the production of waste.
- Water is more important in them refillable containers can be reused.
- Other things like paper, clothes, materials etc.

CLIMATE CHANGE, GLOBAL WARMING, ACID RAIN, OZONE LAYER DEPLETION, NUCLEAR ACCIDENT & HOLOCAUST, CASE STUDIES:

Climate change:

- Climate change is defined as the weather conditions of an area, which are averaged over a period of about 30 yrs taking in to account the weather extremes that are likely to occur.
- Weather is the atmospheric condition of an area during a particular time. The weather changes from year to year, season to season , day to day and even from hour to hour. The weather may be sunny in the morning and rainy during evening.

Global warming:

Industrial dusts, dusts from mining and dusts from automobiles increase the particulate matter in the atmosphere. These particulate matters reflect back the incoming solar radiation in to outer space before it reaches the earths surface.

During the past two centuries. The level of carbon dioxide has increased considerably in the atmosphere. This is due to the excessive combustion like burning of fossil fuel and burning forests.

Acid rain:

Nitrogen oxides , Sulphur dioxide and carbon dioxide released form industries and automobiles are present in the atmosphere. They react with water vapor in the atmosphere to produce nitric acid, Sulphuric acid and carbonic acid which come down to earth along with rain.

Nitrogen + water □ nitric acid Sulphur

+ water□sulphuric acid Carbon

dioxide +water□ carbonic acid

Ozone layer depletion:

In the stratosphere , about 50 km above the earth, there is a layer of ozone called ozone shield. This layer of ozone absorbs the ultra violet rays of the sun so that the rays do not the earth.

The injurious ultraviolet rays cause skin cancer, the ultraviolet rays retard growth of plants. There fore , without adequate ozone shield, our health and food sources will be under constant threat.

Nuclear accidents and holocaust:

The accident occurred in the year 1986. The Chernobyl nuclear power plant has four reactor. The safety procedure was not followed properly therefore, the accident occurred in one of the reactors.

The nuclear industries all over the world faced a crises of accident. The accident has shaken the faith of even staunch supporters of nuclear energy.

CASE STUDIES

Damage to coral reefs, Pacific The severity of periodic warming due to El Nino in 1997 in the Pacific led to the most serious death in coral ever known. It is estimated that about 10% of the Earth's coral reefs were dead, another 30 % were seriously affected and another 30% were degraded. The Global Coral Reef Monitoring Network Townsville, Australia, has predicted that all the reefs could be dead by 2050. Butterfly populations in the United Kingdom Global warming is leading to an early arrival of butterflies in Britain. Scientists say that butterflies can now be spotted much earlier every year in the last two decades. Some, like

the red admiral, can now be seen a month earlier than was the case in the mid – 1970s. Others, like the peacock and the orange tip are appearing between 15 and 25 days earlier than in the past. Future rise in temperature is likely to have a detrimental effect on these butterflies. Some butterflies which need cooler temperatures might suffer.

- **AIR (PREVENTION AND CONTROL OF POLLUTION) ACT:**

- The air (prevention and control of pollution) act was passed in 1981 to regulate and control the hazardous emissions from the automobiles and industrial units. The central board for prevention and control of water pollution is authorized to implement and enforce the act. The central board is also empowered to coordinate the activities of the state boards present in the every state of India.
- The state Govt. can declare any area with in the state as air pollution control area and prohibit setting of industry causing air pollution.

WATER (PREVENTION AND CONTROL OF POLLUTION) ACT:

- It defines water pollution.
- Describes penalties for those guilty of water pollution.
- Setting of an administrative machinery called water pollution level at central and at state level in order to prevent and control water pollution.
- The act prohibits dumping of poisons toxic matters in to streams wells etc.
- It also prohibits activity that impedes the proper flow of the water in a stream.
- The board is authorized to take action against pollution.

PUBLIC AWARENESS:

There is a Chinese proverb which says, 'if you plan for one year, plant rice, if you plan for 10 years , plant trees, if you plan for 100 years ,educate peoples" the education in creating environment awareness is essential for the young generation as well as the oldest generation. The awareness programs must reach both rural and urban people.

POSSIBLE SHORT TYPE QUESTIONS WITH ANSWER:

What is the water Logging ? [2016 –w, new]

Ans. Water logging refers to the saturation of soil with water. Oil may be regenerated as water logged when the water table of the ground water is too-high to conveniently permit an anticipated activity like agriculture etc.

What is Acid Rains ? [2017- w, 2021-W]

Ans. Nitrogen Oxides, Sulphur Dioxide, Carbon dioxide, released from industries and automobiles are present in the atmosphere . They react with water vapour in the atmosphere to produce nitric acid , Sulphuric acid & Carbonic acid which come down to earth long with rain. This is known as acid rains.

What do you mean by Sustainable development ? [2017-w,2021-W]

Ans. Sustainable development is the Organizing Principle for meeting human development goals. While as the sometime sustaining the ability of natural systems to provide the natural resources & ecosystem services upon with which the economy & society depend.

POSSIBLE LONG TYPE QUESTIONS:

Write the feasibility of Sustainable development seeks to strike a balance between economic progress and environment Protection. [2016-w, New]

What is Green House Effect ? How does it cause global warming.[

2016-w, New]

Describe the effect of Urbanisation on the environment. [2016-W, New]

Explain Acid Rain and its effects. [2016- W, 2022-W]

Why Rain water harvesting is inevitable for conservation & management of water? [2016- w, New]

What is rain water harvesting ? Write its advantages. [2017- w, 2020-W]

Write a short note on ‘’Public Awareness to protect our Environment’’. [2017-w, New]

Define global warming. write down the causes and effects of global

warming.[W-22]Q9. Write short notes on green house effect.[W-22]

Define rain water harvesting .state the objectives of rain water harvesting.[W-22]

Give a brief note on ozone layer depletion along with its consequences.[W-21]

UNIT-07

HUMAN POPULATION AND THE ENVIRONMENT

Learning objectives

- *Population growth and variation among nations.*
- *Population explosion- family welfare program.*
- *Environment and human health.*
- *Human rights.*
- *Value education*
- *Role of information technology in environment and human health.*

□ POPULATION GROWTH AND VARIATIONS AMONG NATIONS:

Populations:

Population can be defined as a group of organism of a particular species in a specific area at a particular time.

Ex-1

All the tiger of the same species living in a forest constitute tiger

population. Ex-2

- □ All the teak wood trees in certain woodland constitute teak wood tree population.
- □ In biology , population is all the organism of the same group or same species which live in a perticular geographical area.
- □ Overall population means no. Of people or no. Of animals on a perticular place.

Characteristics of population

The characteristics of the population are mentioned below.

- ❖ Density
- ❖ Natality
- ❖ Mortality
- ❖ Dispersed

❖ Distribution

Density

It is the no of individuals of a population per unit area at a given time.

Natality

- The birth rate of population is called natality. The density of population increases due to production of new individual by germination of seed ,hatching of by birth of young ones.
- Natality does not remain constant. It varies with the rise in population and environmental condition.
- Natality may be zero or positive but never negative.

Mortality

- The death rate of individuals in a population is called mortality.
- Mortality is a negative factor in population growth.
- The causes of mortality may be disease ,flood, earthquake, and other natural calamities.

Dispersed

Movement of members of a population from a particular are is called dispersal.

The three ways of population dispersal are

Migration

- It is the movement of individual from area and return to the same area afterwards.
- Ex-migration of people during flood .
- migration of Siberian crane to chilling lake during winter.

Emigration

- It is the outward movement of individuals of a population from an area. The members who leave the area do not return to the same area.
- It is one way movement.
- Ex- migration of people during partition of India.

Immigration

- It is inward movement of individuals into an area from outside. Ex- people coming into a country to live permanently.

Distribution

Individuals of a population in an area are distributed in three ways.

Uniform

Members are spread out through out the area.

Random

Uneven distribution occurs under favourable condition and no tendency to compete.

Clumping

When several individuals gathering together at same place of extended area , it leads to clumping. It increases the density in that particular area compare to other parts of the same area.

POPULATION EXPLOSION – FAMILY WELFARE PROGRAM:

POPULATION EXPLOSION

The reasons of population explosion are

- Increase in birth rate
- Decrease in death rate
- Though both of the above reason contribute of population explosion but the main problem has come from death rate.
- Todaypeople living longer, people don't die as they used 100 yrs back , dieses like small pox, cholera, plague , diphtheria and measles which uses to take life in 1000.
- Epidemics, wars , which were common in those days, now a day don't accrue in the same frequency.
- With the development of science and technology human population is now almost free for natural enemys and other environmental restraints.
- The important of nutrition, better sanitation , medicine have been reflected in the decline of death rate.

Consequence of over population

- Poverty
- Food supply
- Unhygienic condition
- Unemployment
- Housing problem
- Pollution
- Education problem

• Poverty

If the family size is more and the income is less, naturally it becomes poor, with the addition of even child, the poverty increases more and more.

• Food supply

If the population increases but the production of food does not increases, this will lead to the shortage of food supply.

• Hygienic condition

More people in a small area generally create unhygienic conditions. There is an accumulation of waste material as it is not removed soon.

- **Unemployment**

More number of people means they are more jobs and if sufficient number of jobs are not available. It will lead to unemployment.

- **Housing problem**

For more people , more houses are required and the houses are not to be built at high cost.

- **Pollution**

There is one more problem of population explosion. As every is taken from environment is excess , it will naturally result in population.

- Education problem

It becomes difficult for the government to provide education to all.

Family welfare programme

1. Education

People , particularly those in the reproductive age group, should be educated about the advantages of a small family. Mass media and education institutions can play an important role in this campaign. Ernakulum district of Kerala has earned the distinction of being the first cent percent literacy district in the country.

2. Age of marriage

Raising the marriageable age is the more effective mean to control population.

3. Family planning

Family planning programmes provide educational and medical services which help couples to choose their family size and when to have the children.

● ENVIRONMENT AND HUMAN HEALTH :-

All living organism, including man, interact with environment. the surrounding where we live,eat,breathe, reproduce and die is our environment.

- The soil,water, desert,lake, ocean mountain there effects such as temperature, moisture ,type of soil etc constitute the physical environment.
- The living being constitute the biological environment. natural environment include a number of component, which fall under two categories such as biotic and abiotic. the abiotic components include energy,soil,water, temperature, radiation,wind,gasesetc.the biotic components are plant , animal and microorganism.
- The environment in which man lives affects his health.But it is unfortunate that man has exploited and polluted it environment to satisfy his own needs and greed even satisfy to his own whims and fancy.
- Health is the quality of life.According to WHO(world Health Organisation) health is a State of complete physical, mental and social well-being and not merely the absence of disease.

 Due to constant and gradual deterioration of environment and it's effect on health man has realised the importance of clean environment as a result,a new discipline has emerged called public health.The aim of public health department is to prevent disease, prolong life,promote health and efficiency of people through community effort.

1-Pollution and health:-

Various types of pollution of different nature are a threat to the health of the public .the effects of pollution on the health of human are as follows:

Air pollution

- It reduces quality of air , the gases pollutants like carbon monoxide ,sulphur dioxide , hydrogen sulphide , oxide of nitrogen , smokes, dust , fume etc released into the atmosphere and contributes to serious health problems.
- The pollutants in air affects the respiratory system , irritation of eyes and nose chronic **caugh , asthma , allergies , heart disease are due to expose to polluted air.**

Water pollution

- Changes the quality of water to such an extend that it becomes unsuitable for human uses.
- The industrial effluents sewage discharged uses of pesticides , dyes acids, fertilizers , other toxic materials results in water borne diseases.
- Several pathogens like bacteria ,fungie ,protozoa's, are causative agents for disease like cholera , typhoid ,deihepatytis , gastro enteritis.

Noise pollution

- Which is a feature of human activities is irritating.
- If its intensity is much more than 120 dB it may be cause problem in ear , raises blood pressure , increases pulse rate cause headache, imparmenting of hearings.

2-Occupation and health :-

Human health is also affected by the quality of the environment in the work place.As the choice of job is limited the underprivileged and poor people are compelled doing most risky and hazardous job; therefore suffering from physical illness and psychological stress.

People working in factories, textile mills ,mines, stone centres suffer from many occupational diseases such as

1. Pneumoconiosis (dust diseases)
2. Silicosis(silicon dust)
3. 3.Asbestosis(asbestos dust)
4. Anthracosis(coal dust)

- The textile workers who works in bale opening room suffer from allergic diseases. People who are working in plastics factory, phenyl factory ,petroleum products suffer throat lounges, chest even cancer diseases.

- farmer and farm workers engaged in agricultural fields work use various pesticides, they suffer from toxic poisoning cancer , paralytic and neurological disorders.
- •Due to irregular timing (working in night shift by ratation) the biological clock and the phychological rhythm of the person under goes changes leading to insomnia headache ,high blood pressure, irrigation etc.

3- Stress and health:-

In day to day life people face many stressfullsituation.stress is responsible for many diseases high blood pressure,neurosis , allergies,heartdiseases,and respiratory disorders .

4-Food and health:-

- Food is essential for all us .But at the same time it is a source of many food related disease.
- Food contaminated with harmfull micro organism and warm,toxic released from mirobebs, pesticides metal which can cause food contaminated.

5-Ionising Radiation:-

- Ionising Radiation have carcinogenic effects(cause canser), mutagenic effect (cause changes in gene) in living organism.
- The alpha ,beta and gamma particles are radiation of high energy the energy of these particles damages bons and lungs

HUMAN RIGHTS

- Human rights are the basic rights and freedoms that belong to every person in the world, from birth until death.
- They apply regardless of where you are from, what you believe or how you choose to live your life.
- They can never be taken away, although they can sometimes be restricted – for example if a person breaks the law, or in the interests of national security.
- These basic rights are based on shared values like dignity, fairness, equality, respect and independence.
- These values are defined and protected by law.
- Human rights are relevant to all of us, not just those who face repression or mistreatment.
- They protect you in many areas of your day-to-day life, including:
- your right to have and express your own opinions
- your right to an education
- your right to a private and family life
- your right not to be mistreated or wrongly punished by the state
- The Human Rights Act 1998 made the rights set out by the European Convention on Human Rights part of our domestic law.
- The Human Rights Act means that courts in the United Kingdom can hear human rights cases.
- Before it was passed, people had to take their complaints to the European Court of Human Rights in Strasbourg, France.

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VALUE OF EDUCATION

- Environment value education is about empowerment or developing the capacity to access address environmental issues in their localities. So that they can leave sustainably.
- It is about caring for earth.

Some of the points are given

below

1. Knowledge about environment and population growth

Increase in population of the world requires more food, more homes, more cloths, more infrastructure development etc. Now it is time that humanity becomes aware of the negative impact of population growth and its implications for the present as well as future generation.

2. Knowledge about human environment relation

- Environmental adjuration is essential for environmental degradation.
- Rapid population growth, industrialization, urbanisation, heavy consumption of natural resources and high energy utilization.
- Hence humanity needs to be educated to understand the environment problem and find solution to prevent them for that the environment can be protected.

ROLE OF INFORMATION TECHNOLOGY IN HEALTH CARE

- Information technology is a process of recording, processing and interpreting about an object without being in direct contact without object.
- Computer ,satellites , radar , internet services , television, remote sensing, radio etc, are the common instrument of Information technology.

Information technology in health care

It also provide networking health and giving prescriptions on the internet

- Information technology database for medicine
- Information technology kept computer based past and present record.
- It provides more effective research programme on drawn design
- It provides computerised records and online text books on specialised medical topic
- It provide health policy process.
- It provides innovative health care.

POSSIBLE SHORT TYPE QUESTIONS WITH ANSWER

Define population and its types. [2016-w-N]

Ans: population can be defined as a group of organisms of a particular species in a specific area at a particular time.

Types of population are 1- density,2- nalality,3- mortality.

What is population explosion? [2017-w-N]

Ans : population explosion refers to a great and rapid increase in a population. Specific such an increase in the world wide human population in modern times.

What is value education ? [2018-s-N]

Ans : value education is about empowerment or developing the capacity to access the address environmental issues in their localities. So that they can live sustainably. In a sense , it is about caring for the earth.

What is gene pool? [2018-W-N]

Ans : The gene pool is the set of all genes or genetic information in any population , usually of a particular species.

What are the various objectives of family welfare programme? [2019-W,2022-W]

Ans : the main objective of the programme is to reduce growth rate so as to stabilize the population at level consistent with the needs and potential of national economy .

To ensure adequate , qualitative , preventive and curative health care to preventive and curative health care to people of the state.

What are the major reasons of population explosion.[W-22]

ANS. The main reason of population explosion are-

- Due to decrease in death rate
- Due to increase in birth rate

What is mortality.[W-21]

Ans. the death rate of individual in a population is called mortality. mortality is a negative factor in population growth.

POSSIBLE LONG TYPE QUESTIONS

Explain value of education. [2016-W-N]

Write the role of information technology in environmental studies. [2017-W-N,2018-W-N]

Describes the values included in value education. [2017-W-N ,2019-W]

What is population explosion? Briefly discuss it in Indian scenario? [2018-S-N]Q-5

What do you mean by incineration and pyrolysis? [2019-W]

Q.6.Discuss in brief human rights.[W-21]

Q7. Write short note on family welfare programs.[W-21]