

ENVIRONMENTAL STUDIES: TRUNCATED SYLLABUS

Unit I The Multidisciplinary Nature of Environmental Studies

Definition, Scope and Importance:

Definition: Environmental studies deals with every issue that affects a living organism. It is essentially a multidisciplinary approach that brings about an appreciation of our natural world and human impact on its integrity. It is an applied science, as it seeks practical answers to the increasingly important question of how to make human civilization sustainable on the finite resources that are available

Scope: Environment is not a single subject but an integration of several subjects that include both science and social studies. To understand all the different aspects of our environment, we need to understand biology, chemistry, physics, geography, resource management, economics and pollution issues. Thus, the scope of environmental studies is extremely wide and covers some aspects of nearly every major discipline,

Importance: We live in a world where the natural resources are limited. Water, air, soil, minerals, oil, the products we get from forests, grasslands, oceans and from agriculture and livestock are all a part of our support systems. Without them, life itself would be impossible. As the resources of the earth are used up, the earth cannot be expected to indefinitely sustain this expanding level of utilization of resources. This situation will only improve only if each of us begin to take action in our daily lives that will help preserve our environmental resources.

Need for public awareness:

As the earth's resources are rapidly dwindling and our environment is being increasingly degraded by human activities. Individually we can play a major role in environment management. We can reduce wastage of natural resources and we can act as watchdogs that inform the Government about sources that lead to pollution and degradation of the environment.

UNIT 2 : Natural Resources

Renewable and non-renewable resources

Life on this planet earth depends on a variety of goods and services provided by the nature which are known as natural resources. Water air soil minerals coal forest crops and wildlife are all examples of natural resources.

Any still or reserve that are drawn from nature is a natural resource

Natural resources are of two

Renewable or non conventional energy

The sources are pollution free and can be recycled in nature examples of forest wildlife wind energy biomass energy tidal energy hydro power et cetera solar energy is also a renewable form of energy as it is an exhaustible source of Energy.

Non reversible or conventional energy resources

These are minerals that have been formed in the lithosphere over millions of years and constitute a closed system.

They are present in fixed quantities and once exhausted cannot be replenished easily also they are not recycled in nature easily they need a comparatively longer time.

Examples are fossil fuels like coal petroleum products and natural gas.

The major natural resources are forest resources water resources mineral resources food resources energy resources and land resources System.

1.Forest resources.

Forests are one of the most important natural resources on they have enormous potential in human welfare wildlife and the environment they are not only useful for industries but also for rural economic growth the of a huge potential for reducing poverty while also conserving their valuable key resources.

Commercial uses of forest: forest provide us a large number of commercial goods which include Timber wood pulp food items gum resins non edible oils rubber fibres lakh for the medicines drugs and many more items. Many forest lands are used for mining agriculture grazing and recreation and for development of dams.

Ecological uses of forest.

While a typical tree produces commercial goods worth about rupees 30,000 it provides environmental services of nearly 1 lacs

*Production of an oxygen trees are rightly called the earth's lungs they produce oxygen by photosynthesis which is so vital for life on this earth

*Reduces global warming the main greenhouse gas carbon dioxide is absorbed by the forest as a raw material for photosynthesis the forests canopy act as a sink for carbon dioxide they by reducing the problem of global warming caused by greenhouse gas.

*Wildlife in forests are the house of millions of wild animals and plants.

*Regulation of hydrological cycle forest edge watershed are like giant sponges absorbing the rain falls royal down the run off and slowly releasing the water for recharge of springs.

*Soil conservation forests bind soil particles tightly in the roots and prevent soil erosion.

Deforestation:

Deforestation rate is relatively less in temperate countries but is very alarming in tropical countries the forested area in India seems to have stabilized since 1982 with about 0.04%

decline annually estimated that about 1.44 millions of land was brought under a forest station during the period leading to stabilization.

However we are still far behind the target of achieving 33% forest area as per our National forest policy.

2. Water resources

Water is an indispensable natural resource on this Earth on which all life depends we have enormous resources of water on the earth a mountain to about 14 million. The water from various moist and wet surfaces evaporates and falls again on the earth in the form of rain snow and passes through living organisms and alternati returns to the oceans.

Use and over utilisation of surface and groundwater.

Due to its unique properties water is of multiple uses for all living organisms most of life processes take place in water contain in the body of take of nutrients that distribution in the body regulation of temperature and removal of waste all regulated through water.

Floods

In some countries like India and Bangladesh rainfall does not occurred throughout the year rather 90% of it is concentrated into a few months June to September heavy rainfall occurs causing flats in the low lying coastal areas prolong down for can also cause the overflowing of lakes and rivers resulting into.

Droughts :when annual rainfall is below normal and less than evaporation drought conditions are observed

There are about 80 countries in the world lying in the arid and semi added regions that experience spells of droughts very often extending up to your long.

3. Mineral Sources

A mineral is a naturally occurring substance of definite chemical composition and identifiable physical properties. Minerals are formed over aperiod of million of years in the earth's crust. Iron, Aluminium, copperand zinc, manganese, are materials for industrial use. Important non-metallic minerals include coals alt, clay, cement andsilica. Minerals with important ornamental value are silver, platinum, diamond emeralds and rubies.

4. Food resources:

We have thousands of edible plants and animals over the world out of waste agriculture animal husbandry and fishing are the main food resources. Major crops on which humanity depends as staple food a wheat rice and maize. Really 1600 million metric tons of these three grains are grown annually.

Modern agriculture and its effects:

Modern agriculture makes use of hybrid seeds of selected and single crop variety Hi-Tech equipments and lots of energy subsidies in the form of fertilizers pesticides and irrigation water the food production has increased tremendously evidence by green revolution. The major impacts of modern agriculture

Impacts related to high yielding varieties (HYVS)

The uses of HYVS encourage monoculture that is the same genotype is grown over vast areas. In case of an attack by some pathogens there is total devastation of the crop by the disease due to exactly uniform conditions will help in rapid spread of the disease.

Fertilizer related problems:

a)Micro nutrient balance:

Most of the chemical fertilizers used in modern agriculture have nitrogen Phosphorus and potassium which are essential micro nutrients. Excessive use of fertilizers cause micro nutrient imbalance.

b)Nitrate pollution:)Nitrogenous fertilizers applied in the fees often leech deep into the soil and ultimately contaminate the. The nitrates get concentrated in the water and when they are concentration exceeds 25 milligram per litre they become the cause of a serious health has hazard called Blue baby syndrome or where the amount of hemoglobin is decreased in the babies blood and the babies skin turns blue.

c) Eutrophication:

Excessive use of nitrogen and phosphorus fertilizers in agriculture fields leads to another problem which is not related to soil but related to water bodies like lakes. Notation Phosphorus used in plant feels is worst of and reach water bodies causing over noticement of the lakes as a process known as eutrophication. Due to eutrophication the lakes get invaded by algal bloom. These uncle species grow very fast by rapidly using up the nutrients. The fishes also get killed due to the toxins which are produced and the oxygen is consumed in the process of decomposition and very soon the water gets depleted of dissolved oxygen. This for the effects aquatic fauna and alternately and your Ruby conditions are created were only pathogenic anaerobic bacteria can survive. Does due to excessive use of fertilizers in the agricultural fields the lake ecosystem gets degraded.

d)Death of non target organisms

Many insecticides are broad spectrum poisons which not only kill the target species but also several non target species that are useful to human beings.

5. Energy Resources::

Energy consumption of a nation is usually considered as an index of its development. The first form of energy technology probably was the fire which produce heat and the early man used it for cooking and eating purposes. Wind and hydro power have also been in use for

the last 10000 years. The invention of steam engines replace the burning of wood by coal and coal was later replaced to a great extent by oil.

Solar energy:

Sun is the ultimate source of energy directly or indirectly for all other forms of energy. As we have some several techniques for harnessing solar energy some important solar energy harvesting devices are discussed below.

i)**solar cooker:** solar cooker make use of solar heat by reflecting the solar radiations using a mirror directly on to a glass sheet which covers the black insulated Box with in which the raw food is kept. A new design of solar cooker is now available which involves a spherical reflector instead of plain mirror that has more heating effect and hence greater efficiency.

ii)**Solar cells:** they are also known as photo voltaic cells or PV cells. Solar cells are made of thin wafers of semiconductor materials like silicon and gallium. When solar radiations fall on them a potential differences produced which causes flow of electrons and produces electricity.

iii)**Solar water heater:** it consists of an insulated box painted black from inside and having a glass lid to receive and stock solar heat. Inside the box it has black painted copper coil through which cold water is made to flow in which gets heated and flows out into a storage tank. The hot water from the storage tank fitted on rooftop is then supplied through pipes into buildings like hotels and hospitals.

Wind Energy:

The wind flow of motion energy can be harvested by wind turbines which converts kinetic energy in the wind into mechanical power or electricity. A windmill is basically a mechanical arrangement to convert wind energy into another form of energy as it has blades and the rotation of the blades makes the turbine rotate. The turbine is attached with an electrical generator which converts mechanical energy of the turbine into electrical energy.

The blades are angled into the wind so as to rotate in a way which maximize the generation of electricity.

Tidal energy::

High Ocean tides produced by gravitational forces of the moon contain enormous amount of energy. A difference of several metres is required between the height of high and low tide to spin the turbines. During high tide the sea water flows into the reservoir of the barrage and turns the turbine which in turn produces electricity by rotating the generators. During low tide when the sea level is low the sea water stored in the barrage reservoir flows out into the sea and again turns the turbine generating electricity. In India gulf of cambay and gulf of Kutch including the Sundarban deltas are the tidal power sites.

Hydro power:

The water flowing in a river is collected by constructing a big dam where the water is stored and allowed to fall from a height. The blades of the turbine located at the bottom of

the dam move with the first moving water which intern rotate the generator and produces electricity. Hydro power does not cause any pollution it is renewable and normally the hydro power projects are multipurpose projects helping in controlling floods and used for irrigation navigation etc.

Geothermal energy:

The energy honest from the hot rocks present inside the earth is called geothermal energy. A geothermal power plant uses steam obtained from the geothermal reservoirs to generate electricity.

6. Land Resources:

Land is a finite and valuable resource upon which we depend for a food fibre and fuel wood. The lithosphere is the top most layer of the earth whose main components are form and solid rocks and unconsolidated material often called soil a regulate. A rock does not possess a definite composition like that of a chemical compound rather it is a mixture of various minerals. Rocks are of great economic value and the following are some of the direct benefits of rocks:

Rocks after disintegration by mechanical and chemical processes get converted into valuable soil

Rocks are houses of a great variety of minerals which are used in various ways in manufacturing industries

Rocks are also a source of your minerals such as cool petroleum and natural gas

Rocks are resource of precious metals like gold silver platinum which are used for making ornaments

Rocks supply different types of stones which are of great using constructing houses building dams roads etc line and cement which are important building materials are also the products of rocks.

Land degradation:

With increasing population growth the demands for adible land for producing food fibre and fuel would is also increasing hence there is more pressure on the limited land resources which are getting degraded due to over exploitation. Soil degradation is a real cause of alarm because solve formation is an extremely slow process and it takes about 200 to 1000 years for the formation of 1 inch of soil depending on the climate and soil type. Soil erosion water logging silent salinization and contamination of the salt with industrial waste like fly ash press mud or heavy metals all cause degradation of land.

Soil erosion:

Soil erosion is wearing away of soil and it is defined as the movement of soil components specially surface litera and top soil from one place to another.

Soil erosion results in the loss of fertility of the soil because it is the top soil layer which is fertile.

Climatic agents:

Water and wind are the climatic agents of soil erosion. What are effects soil erosion in the form of torrential range rapid flow of water along slopes run of wave action and melting and movement of snow.

Biotic agents:

Excessive grazing mining and deforestation are the major biotic agents responsible for soil erosion.

Deforestation without reforestation overgrazing by cattle surface mining without land reclamation irrigation techniques that lead to soil salt build up what allowed soil farming on land with unsuitable terrain soil compaction by agricultural machinery action of cattle trampoline etc make the top soil vulnerable for erosion.

Methods for prevention of control of soil erosion:

i) Conservation: Conservation of farming popularly known as no till farming causes minimum disturbance to the top soil. Here special tillers break up and losing the substance sub surface soil without turning over the top soil. The churning machines makes silks in the unlocked soil and injection seeds fertilizers herbicides and a little water in the slate so that the seed germination and the crop grows successfully without competition with weeds.

ii) Contour farming : On gentle slopes crops are grown in rows across rather than up and down a practice known as Contour farming. Each row is planted horizontally along the slope of the land as a small dam to help hold soil and slow down loss of soil through run off water

ii) Terracing: it is used on steeper slopes are converted into a series of broad terraces which run across the contouring returns water for crops at all levels and cuts down soil erosion by controlling run off.

iii) strip cropping : here strips of crops alternated with strips of soil saving cover crops like grasses or grass legume mixture whatever run of comes from the cropped land soil is written by the strip of cover crop and this reduces soil erosion fixing legumes also help in restoring soil fertility

iv) Alley cropping: it is a form of intercropping in which crops are planted between rows of trees or shrubs this is also called agro forestry even when the crop is harvested the soil is not follow because trees and shrubs still remain on the soil holding the soil particles and prevent soil erosion

v) Wind brakes or shelter belts: they help in reducing erosion caused by strong winds the trees are planted in long rows along the cultivated land boundary so that wind is blocked the wind speed is substantially reduced which helps in preventing wind erosion of soil erosion is a gradual process and very often the cumulative effect becomes visible only when the

damage has already become a reversible the best way to control soil erosion is to maintain a liquid vegetation cover over the soil desertification

DESERTIFICATION: is a process whereby the productive potential of arid land falls by 10% or more. It leads to the conversion of range lands or irrigated crop lands to desert like condition in which agricultural productivity falls desertification is characterised by vegetation and loss of vegetable cover depletion of groundwater soil erosion it includes the gravitation of the ecosystems with in as well as outside the natural deserts.

Causes of desertification: formation of deserts take place due to natural phenomena like climate change or maybe due to like climate change or maybe due to abusive use of lands the major anthropogenic activities responsible for desertification are follows desertification

- a) **Deforestation** the process of denuding and degrading of forested land initiates a desert producing cycle that feeds on itself since there is no vegetation to hold back the surface run of water drains off quickly before it can do the soil so can do the soil to Naresh the plants or to replenish the groundwater this increase soil erosion loss of soil fertility and loss of water
- b) **Overgrazing:** the reasons most seriously affected by desertification are the cattle producing areas of the world the increasing cattle for population heavily Grazing in grasslands of forest and answer result denote the land area when the earth is the nuded the micro climate near the ground becomes more in hospital to see germination the top for 10 layer is also lost and the plant growth is badly hampered in such soils the dry Barren land reflects more of the suns hit changing wind patterns driving away moisture Laden clouds leading to further desertification
- c) **Mining and quarrying:** These activities are also responsible for loss of vegetable covers leading to desert notification this is a found to occur in the arid and semi arid areas of all the continents during the last 50 years about 900 million hectares of land have under gone desertification over the world it is for the estimated that if desertification continues at present rate then within a few years it will affect such lands which are presently occupied by 20% of the human population

Unit 5. POLLUTION AND TYPES OF POLLUTANTS :

Pollution is an unfavourable alteration in the physical and chemical or biological characteristics of air water and land that may all will adversely affect human life human life industrial life living conditions and it is a sort of negative stress exerted on the positive health of the ecosystem. The substances that cause the undesirable changes in the air water and land are referred to as the pollutants does pollutant is a substance example dust smoke chemicals dioxide Mercury or factor like heat noise etc that on release into the environment has an actual operation adverse effect on human interest according to Indian protection act of 1986 pollutant has been defined as any solid liquid gaseous substance present in such concentration as may be injurious to the environment.

AIR POLLUTION:

Air pollution can be described as an undesirable change in the natural characteristics of atmosphere due to the containment of indoor and outdoor air by any chemical biological and physical agents.

Sources of air pollutants: based on the mode of generation of pollutants these are classified into two broad categories .

i) Natural sources of pollutants these air pollutants are released by natural calamities such as forest fires the

* **Forest fires:** a common feature of tropical areas or areas of high temperature throughout the year very large quantities of smoke and particulate matter are released during their break out in the forest.

* **Volcanic eruptions** during eruption of volcano Lava is produced along with release of minute solid particles gases and radiation

* **dust storms** :these are caused due to the movement of hot winds around the earth and are concentrated in certain places at a particular time pollen grains these are released by various plants in abundance in spring season allergy related diseases in humans

* **Anthropogenic sources:** of pollutants the man made activities which cause pollutants are called anthropogenic sources of pollutants these are domestic pollutants the use of insecticides in homes for cleaning burning of fuel in home for cooking purpose are primary domestic pollutants .

* **Agricultural pollutants:** many pesticides insecticides and sprays used on crops as a means of protection from diseases in crops and these chemicals also get emitted in the air as a means of small droplets .

* **Industrial air pollutants:** industries like nuclear power plants iron and steel metals and minerals and paper mills textile chemical cement fertilizer ,distilleries pharmaceutical, mining etc are of major concern some of these industrial pollutants it causes chlorosis and defoliation of plants, decolorises silver ware and jewellery .Produces eye irritation, throat irritation and nausea .

* **ammonia:** it escapes from fertilizers ,dye and lacquer units. Ammonia produces bleaching spots on leaves and flowers Browning and softening of fruits in human beings it causes irritation and inflammation of respiratory tract .

* **hydrogen cyanide:** it is produced by metal plating and chemical industries Hydrogen cyanide attacks nerve cells produces numbness and dry throat accidents in chemical plants release a lot of pollutants into the atmosphere Bhopal gas tragedy of 1984 December 3 to 4 was caused by bursting of storage tank having fracture of pesticides

Types of air pollutants :can be divided on the basis of the form in which they are processed and on the basis of degradation on the basis of form pollutants.

Primary pollutants :these are substances which are directly emitted from the source and remain in the form as primary pollutants examples smoke as fuels dust nitric oxide and Sulphur dioxide

Secondary Pollutants: chemical reaction between the primary pollutants and constituents of the environment that is those which are actually present in the environment. Eg. those which already present in the iron man ,eg. smog ozone sulphur trioxide ,nitrogen dioxide ammonium sulphate.

Effects of air pollution :air pollution has adverse effects on living organisms and materials effects on human health diseases like asthma pollen allergies bronchitis long cancer or all associated with air pollution Baker at all 1968 reported that in many American cities along the eastern Sea coast.

Water pollution

Water pollution is a major global problem which requires on going evolution and revision of water resource policy of all levels. In practical the term water pollution refers to travel types of aquatic contamination like enrichment of nutrients in lakes and rivers from fertilizers introduction of toxic chemical or water bodies without educate treatment to such a level that the biotic community such as fish are affected to cultural extent.

Causes of water pollution

The various causes of water pollution maybe describe on the basis of origin of pollutants that deteriorate the water quality the important sources of water pollutants.

i)point sources which are specific sides near water bodies which directly discharge influence into them major sauce of water pollution industries power plants and guarded coal mines of show oil Wells.

ii) nonpoint sources is where the discharge of toxic chemicals is not at any particular site rather, the sources are scattered which individually or collectively pollute entire surface rainwater sweeping roads and fields, atmospheric deposition etc are the non point sources of water pollution

The major sources of surface water pollution

i)Sewage: emptying the drains and she was in freshwater bodies causes water pollution the problem is severe in cities

ii)Industrial Effluents: industrial waste containing toxic chemicals acids alkalis metallic solves phenol cyanide ammonia radioactive substances etc as sources of water pollution they also cause thermal a pollution of water.

iii)Synthetic detergents synthetic detergents used in washing and cleaning produce form and pollute water

iv) Agrochemicals: agrochemicals like fertilizers containing nitrates and phosphate and pesticides insecticides herbicide etc worst by rainwater and surface run off of polluted water

v) Oil spill all splash into sea water during drilling and shipment

vi) Waste: it waste heat from industrial discharges increases the temperature of water bodies and affects distribution and survival of sensitive species

Effects of Water pollution

The polluted water usually contains pathogens like virus bacteria parasitic pathogens protozoa, worms there for it is the source of water borne diseases like jaundice Cholera typhoid etc.

i) polluted water reduces dissolved oxygen content thereby eliminate sensitive organisms like planktons and

ii) It affects the rate of photosynthesis of aquatic plants and affects aquatic life

iii) Pollutant such as heavy metals pesticides cyanide and many other organic and inorganic compounds are harmful to aquatic. The demand of dissolved oxygen increases with addition of biodegradable organic matter which is expressed as biological oxygen demand or BOD. BOD is defined as the amount of oxygen required to be completely decomposed by degradable organic matter of a given volume of water over a period of 5 days at 20 degrees centigrade. Beauty values of any water sample associated with water quality. The non biodegradable toxic compounds bio magnify in the food chain and cause sick effects and various levels of food chain. Substances like DDT are not water soluble and have affinity for body lipids the substances tend to accumulate in the organisms body this process is called bio accumulation the concentration of the stocks is built up at successive levels of food chain this process is called bio magnification.

Planting trees would reduce pollution by sediments and will also prevent soil erosion

i) For controlling water pollution from point sources treatment of waterways is essential before being discharged.

Soil pollution

Contamination of soil with sewage sludge industrial sludge solid waste roadside leakage agrochemicals and radioactive substances which reduces its productive capacity is called soil pollution.

Sources of soil pollution

A soil pollution is any factor which deteriorates the quality texture and mineral content of the soil or which disturb the biological balance of the organisms in the soil the major sources of soil pollutants are as follows

Industrial wastes:

i) Waste from various industries include chemical such as magnesium lead copper zinc cadmium, cyanide acids alkalis organic substances metals processing industries and engineering industries a major sources of such toxic element mixing in the soil as pollutants.

ii) pesticides this a chemicals that include insecticides fungicides algae size rodenticides and we decides which are spread in order to improve productivity of agriculture forestry and horticulture DDT BAC endrinaldrine Di aldrine organic sulphurous compounds are toxic to plants.

iii) chemical fertilizers the excessive use of chemical fertilizers reduce the population of soil born organisms the change the structure of soil decreases the product activity and increase the soil content of soil.

Municipal waste: the solid waste from houses shops offices schools hospitals street road sweepings are collected and disposed in municipal waste disposal size which become a sauce of soil pollution.

Electronic waste: this includes irrepable computers mobiles and other electronic goods often called e-waste these are generally sent to developing countries like India China and Pakistan for extraction of metals like copper iron silicon nickel and gold through cycling the scientific method of treating e waste is an environmental friendly way which has been developed it is called even says

Other pollutants the sun also received some doctor chemicals during weather in austin rock so pollutants example radioactive compound

Effects of soil pollution

Some of the persistent oxy chemicals inhibit the non target organisms soil flora and fauna and reduce soil productivity.

ii) when UN treated industrial e fluent are released in the environment as such its richest to the agricultural fields it close the pose of the soil which leads to loss of soil productivity.

lii) nitrogen and phosphorus from the fertilizers in soil reach namely water bodies with agricultural run of and cause eutrophication chemicals are there degradation products from soil may percolate and contaminate ground water resources.

iv) sewage sludge has many types of pathogenic bacteria viruses and intestinal worms which may cause very types of diseases.

Soil pollution control

Domestic and municipal waste have to be properly collected by segregation and then treated and dispose scientifically in land fills.

ii) industrial waste materials have to be probably treated at sauce by segregation of waste or adopting integrated waste management methods.

iii) methods of soil conservation should be used to restore Sal fertility

iv) agriculture waste and agrochemical waste like pesticides and fertilizer should be properly.

v) legal methods to control the pollutant should be implemented and public awareness about pollution should be wider.

vi) bio pesticides bio fertilizer should be used in place of chemicals

Noise pollution

Noise pollution can be defined as unwanted or displeasing sound that distracts and interrupts the balance of human and animal life.

Sources of noise pollution

Noise pollution like other pollutants is also a by product of industrialisation urbanization and modern civilization. The noise pollution has two sources that is industrial and non industrial.

The industrial sources : include the noise from various industries and big machines working at a very high speed with high noise intensity.

Non industrial sources of noise include the noise created by transport of vehicular traffic and the neighbourhood noise generated by various sources. Most leading noise sources are wrote traffic aircraft rail roads industry construction and noise in buildings. Nice pollution is measured in decibels Saturday and 20 decibels there is in pain and hearing beacons to be damaged at 85 decibels.

The main sources of noise pollution are described below:

Across earlier the national parks and whistlings worth considered to be the noise full pollutions free zone in these areas low flying military aircrafts has caused noise pollution.

Traffic the problem of traffic created by the vehicles is the significant source of noise pollution exhaust system of auto trucks buses cause and motorcycles also cause noise pollution.

Industrial noise different machines used in industries cause noise pollution these machines include compressors motors and other machineries. In the princess of industries it is recommended to plant trees which act as absorbance of noise.

Railway stations locomotive engines horns and vessels and switching and shunting operations in railyards are the major sources of noise pollution.

Effects of noise pollution:

Interferes with men's communication in a noisy area communication is severely.

Hearing damage noise can cause temporary permanent hearing loss it depends on intensity and duration of sound.

Physiological and psychological changes continuous exposure to noise affects the functioning of various systems of the body it may result in hypertension insomnia gastro intestinal and digestive disorders peptic ulcers blood pressure changes behavioural changes emotional changes etc

Control of noise pollution:

Tree plantation effective solution to prevent noise pollution is to grow plants bushes and trees around the sound generating sources sound passage is blocked by the dense shrubs and.

Sound proof homes to block unwanted noise from outside sound proof doors and windows can be installed.

Loudspeaker prohibition loudspeakers should be banned at any cost for the welfare of the people.

White noise machine for overcoming the effects of noise pollution latest technology called white noise machine should be used this device converts the unbearable noise into pleasant sound. It is placed between the source of noise and the receptor produces soft sound like that of a waterfall and soft music.

Machine quality the quality of machine should be optimise to reduce sound production lubrication of machinery should be done.

Nuclear hazards and human health risks:

Radioactive substances are present in nature they undergo natural radioactive decay in which unstable isotopes spontaneously give out fast moving particles high energy radiations or both at fix rate until a new stable isotope is formed. The isotopes release energy either in the form of Gamma rays ionization particles that is alpha particles and beta particles. The Alpha particles are first moving positively charged particles where as beta particles are high speed negatively charged electrons. The ionization radiations have variable penetration power.

Droughts:

When annual rainfall is below normal and less than evaporation draught conditions are created. There are about 80 countries in the world lying in the arid and semi arid regions that experience frequent spells of droughts very often extending up to year long duration.

Anthropogenic causes of drought draught it is a material logical phenomenon but due to several anthropogenic causes like overgrazing deforestation mining etc there is spreading of the desert standing to convert more areas to drought affected areas. In the last 20 years India has experienced more and more desertification day by day by increasing the vulnerability of larger parts of the country to . Intensive cropping pattern and increase exploitation of water resources through well or canal irrigation has converted drought prone areas into desertified areas.

Remedial measures:

Indigenous knowledge in control of drought and desertification can be very useful for dealing with the problem.

Carefully selected mixed cropping help optimise production and minimise the risk of crop failures.

Social forestry and western development can prove quite effective to fight the problem.

Dams benefits and problems:

Big dams are often regarded as a symbol of national development. However there are often several issues and problems related to these.

Benefits:

River valley projects with big dams have usually being considered to play a key roll in the development process due to their multiple uses. Dams have to Mendes potential for economic upliftment and growth they can help in checking floods and femins generate electricity and reduce water and power shortage provide irrigation water to lower areas providing drinking water in remote areas and promote navigation fishery etc.

Environmental problems:

The environment problems of big dams can be at the upstream as well as downstream levels.

The upstream impacts are:

Displacement of tribal people

Loss of forest flora and fauna.

Changes in fisheries and the spawning grounds

Station and sedimentation of reservoirs.

Breeding of vectors and spread of vector born diseases

Growth of aquatic weeds

The downstream impacts are:

Water logging and salinity due to over irrigation

Micro climatic changes

Reduce water flow and salt deposition in rivers

Loss of land fertility along the river since the sediments carrying nutrients get deposited in the reservoir.

Unit 6. Social Issues and the Environment:

Climate change

Climate is the testis sticks of weather over long period of time climate differs from weather as weather only describe the short term conditions in a given region where as the climate is defined over a long period of time climate change refers to change of climate due to natural or anthropogenic activities that alter the composition of the global atmosphere.

Causes of climate The causes of climate change can be divided into two categories that is natural causes and causes created by man.

Natural causes

Continental drift :The continents were formed when the land mass became gradually begin gradually drifting apart millions of years back this drift impacted the climate because it change the physical features of the land mass their position and the position of water bodies over.

Volcanic activities eruption in a volcano throws out large volumes of Sulphur dioxide water vapour dust and ash into the atmosphere these gases and dust particles partially block the incoming race of the Sun which leads to atmospheric cooling.

Ocean currents :The oceans are a major component of the climate tick system they cover about send you one percent of the earth and absorbs about much of the sun's radiation as the atmosphere or the. Ocean currents distribute amount of heat across the planet roughly the same amount as the atmosphere. Ocean currents have been known to change direction or slow down much of the heat that escape from the oceans is in the form of water vapour the most abundant greenhouse gas on. Yet water vapour also contributes to the formation of clouds which shade the surface and have a net cooling effect.

Anthropogenic causes: following are the anthropogenic causes responsible for climate

Emission of greenhouse gases: greenhouse gases are those gases present in the atmosphere which have the potential to rise to raise temperature of surface of Earth like carbon dioxide methane nitrous oxide chlorofluorocarbons water vapour etc

Emission of aerosols: Particles and aerosols in the air can also affect climate human activities such as burning fossil fuel fuels and biomass contribute to emission of the substances sulphase organic carbon and other aerosols can cause cooling of reflecting sunlight this erosols can interact with clouds changing a number of cloud properties such as their formation dissipation reflectivity and precipitation.

Global warming: it is a century scale rise in average global temperature. The planets average surface temperature has written about 9 degree centigrade since the last 19th century change driven largely by increase house.

Measures to check global:

*Cut down the current rate of use of chlorofluorocarbons and fossil.

*Shift to new and renewable energy resources.

Ozone layer depletion: The ozone layer is a layer in Earth's atmosphere. It absorbs 97 to 99% of the sun's high frequency ultraviolet light which is potentially damaging to life on earth.

The photochemical mechanism that gives rise to the ozone layer is actually when ozone is formed by atomization of oxygen in which the oxygen molecule is split into individual oxygen atoms followed by combination of these atomic oxygen with another oxygen molecule giving rise to ozone. The ozone molecule is unstable and when ultraviolet light hits ozone it splits into a molecule of oxygen and an individual atom of oxygen, a continuing process called the ozone cycle.

Process of depletion of ozone layer in Antarctic ozone hole was discovered by Dr Joseph Farman and his colleagues.

Ozone depleting substances include chlorofluorocarbons, hydrochlorofluorocarbons, hydrobromocarbons, methyl bromide, carbon tetrachloride and methyl chloroform.

Consequences of ozone layer depletion

Ozone layer depletion increases the amount of harmful ultraviolet radiations that reach the Earth's surface which leads to the following consequences.

*It inhibits photosynthesis which affects the food chain.

*It impedes bronchial functions and is toxic.

*Skin cancer in humans, eye damage such as cataracts, immune system damage, reduction in photosynthesis, damage to DNA in various life forms.

Environment Protection Act.

The Montreal Protocol on substances that deplete the ozone layer is a protocol to the Vienna Convention for the Protection of the Ozone Layer. It is an international treaty designed to protect the ozone layer by phasing out the production of numerous substances that are responsible for ozone depletion.

Kyoto Protocol: The Kyoto Protocol is an international treaty which extends the 1992 United Nations Framework Convention on Climate Change that commits state parties to reduce greenhouse gas emissions based on the fact that global warming exists and that human-made carbon dioxide emissions have caused the global warming.

Unit 7. Human population and the Environment

Environment and Human Health:

Urbanization and industrialization has brought in prosperity but on the towns side it leads to diseases related to overcrowding and poor quality drinking water, resulting in an increase in water-borne diseases like infective diarrhoeas and air-borne bacterial diseases like tuberculosis.

Human Rights: These include the equitable distribution of environmental resources, the utilization of resources and Intellectual Property Rights, conflicts between people and wild life especially around Pas, resettlement issues around Development projects such dams and mines and access to health to prevent environment related diseases.

Unit8.Field Work

Project on Common plants, Insects, birds of Southfield College Garden



YOUTUBE LINKS

<https://youtu.be/x1ZwfMCpvtc>

<https://youtu.be/r43UP6piMpc>

<https://youtu.be/M42SnzjiEIM>

https://youtu.be/O_UP8dYqz80

<https://youtu.be/pLQxfmJLWPQ>

<https://youtu.be/5cSwMZ3pEYc>