

Unit - 1.

Environment → Environmer (surroundings)

⇒ Environmental Management :-

Environment can be defined as "external surroundings and conditions which directly or indirectly affects which directly the living organism".

Ecology :-

The term ecology was given by "Ernest Haeckel".

Ecology come from two words :-

Oikos + logos
(Homes) (Study)

Ecology (definition) :-

Study of organism in their natural home.

OR

Ecology is the study of organism the environment and how the organism interact with each other and their environment.

⇒ Structure of the Ecosystem

(i) Abiotic components
(Non living components)
i.e. climate, Soil energy

→ Physical
→ Chemical

(ii) Biotic component
(Living component)
i.e. plant, Procedure

→ Herbivores
→ Carnivores
→ Omnivores
→ Detritivores

(i) Abiotic components :-

Abiotic components are those components that include all the non-living components.

* For example :- Soil, water, wind, Rain and minerals.

Also known as non-living components.

Abiotic components

⇒ Physical components
i.e. → water availability
sunlight, temperature.

⇒ chemical components
i.e. Essential nutrients
such as carbon.

(ii) Biotic components :-

Biotic components are those components that include all living components.

* i.e.:- Plant, Animals, micro-organisms

Biotic components also known as living components. This includes animals, plants, bacteria or algae present in ecosystem.

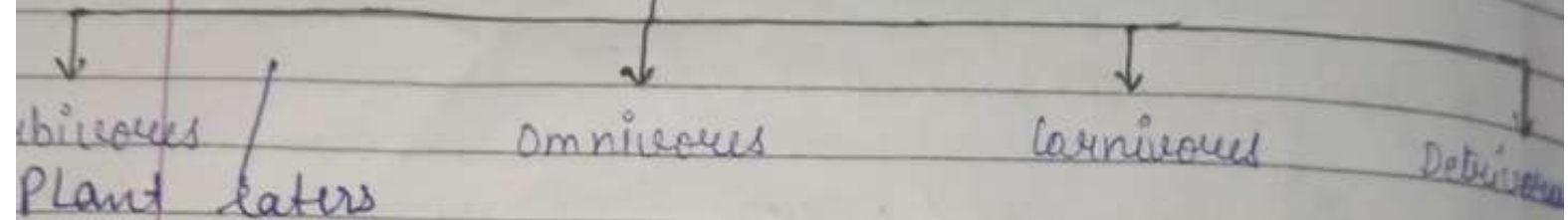
* Producers :-

Producers are mainly green plants which are capable of producing their own food by the process of Photosynthesis.

* Consumer :-

Consumer are organisms that eat other organisms. They feed directly or indirectly on Producers for food and energy.

* Consumer Types



* Herbivores :-

Those organisms only eat plants. These are also known as plant eaters. Because they eat producers.

i.e → Cow, sheep, rabbit

* Carnivores :-

Those eat only type of Consumer. Also known as meat eaters.

i.e → Tiger, Lion, frogs, foxes, polar.

* Omnivores :-

Those eat both producers and consumers.

i.e → Human, monkey, Rat, birds.

* Detritivores :-

These are organisms that eat dead or decaying plants or animals or food.

OR

These derive their nutrition from organic waste of food and decaying plants and animals.

→ Insects, Earthworms, Termites.

* Decomposers :-

Decomposers are organisms that break down dead or decaying organisms that carry out decomposition.

→ Bacteria and fungi, Earthworm Complex ~~Compound~~. Decomposers. Simple Compound (Dead organisms).

Abiotic Components :-

Also known as non-living components.

Importance of Eco System:

- * It provides habitat to wild plants and animals.
- * It promotes various food chains and food webs.
- * It helps in maintaining usual flow of energy in ecosystem.
- * It controls essential ecological processes and promote - lives.

Sustainable Development:

Sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

It poses on two things:

- * It is a long-term concept.
- * Natural resources are important for as well as for future generations also.

To sustainable development the following strategies should be followed:

- * Control over the population growth
- * Conserve natural resources
- * Conserve on pollution prevention.
- * Focus on waste reduction.
- * follow 3R.

Sources of Energy :-

those sources say which we get energy are know as sources of energy.

Sources of Energy

Renewable Resources of energy / Non-conventional

It can be used again and again throughout the life.

It has low carbon emission say there are environment friendly

It is present in unlimited quantity.

Cost is low

Large land area is required for installation of its day.

→ Solar energy, wind energy etc.

Non-Renewable Resources of energy / Conventional

It cannot used again and again because it will get exhausted one day.

It has high carbon emission so not environment friendly.

It is present in limited quantity.

Cost is high.

Less Land area is required for its installation.

i.e → Coal, petroleum Diesel etc.

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Advantages of Renewable source of energy:

- * These resources can be replenished within a short period of time.
- * Mostly these resources are fairly non-polluting and availability locally.
- * fairly cheap.
- * Continuous supply.
- * Renewable sources help in stimulating the economy of country.
- * Renewable sources also increases job opportunities.

Disadvantages of Renewable Sources of energy:

- * It is not easy to set up a plant.
- * Solar energy can be used during the day time and not during night or rainy season.
- * It generate pollution.
- * Technology used is expensive.
- * They can effect bird population as they are quite high.
- * low reliability.

Rainwater Harvesting :

Rainwater Harvesting is a technique of collecting rainwater and saving it by constructing special by water-harvesting structures for later use.

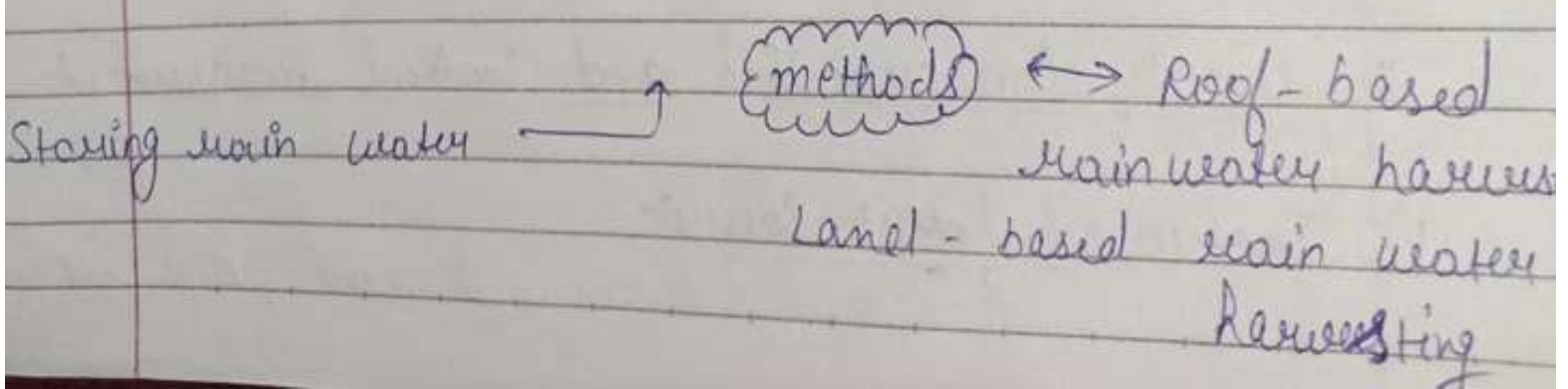
Objectives of Rainwater Harvesting :-

The following are the objectives of rainwater-harvesting :-

- * To reduce run-off losses.
- * It avoids flooding.
- * It also reduces ground water contamination.
- * It helps in reducing soil erosion.
- * It helps in raising the water-table by recharging the groundwater.

Methods of Rain-water Harvesting :-

- a) The rain ^{water} that falls on the roofs of the buildings is collected and stored in underground tanks or diverted to some abandoned well. The collected ~~water~~ may be drawn from the tank or well by using hand pump or motor pump for future.
- b) In foothills water flowing from springs is collected in embankment type water storage. The collected water can't be supplied to the ~~nearby~~ population through pipes.



Deforestation

Deforestation is the conversion of forest to a permanent non-forested land to be used as agriculture, grazing or urban development.

Conversion

Effects of Deforestation

The deforestation sometimes badly damage the environment in following ways:-

- * water and soil resources erosion / loss and flooding.
- * climate change.
- * Decreased biodiversity, habitat loss of animals.
- * Economic losses.
- * Social consequences.

Causes of Deforestation

- * Population Explosion / Control
- * over grazing
- * Shifting cultivation
- * mega-hydel projects
- * mining
- * industries.

Forest Conservation and Control measures

- 1.) Increased forest cover:- more and more trees should

be planned to increase forest cover.

Some of these are:

- * Agro-forestry
- * Social forestry
- * shelter plantation
- * reforestation

2) Population Control:

Control and stabilize the population growth, provide better facilities in the villages so that migration of population towards cities can be checked.

3) Discard Primitive Agriculture Practices:

Discourage wrong Agricultural practices like mono-culture etc.

4) Regulate mining Activities:

To Reduce impact on forests advance technologies should be used.

5) Awareness:

Make people aware to the various aspects of forest management and consequences of forest degradation.

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Unit-2

Air Pollution

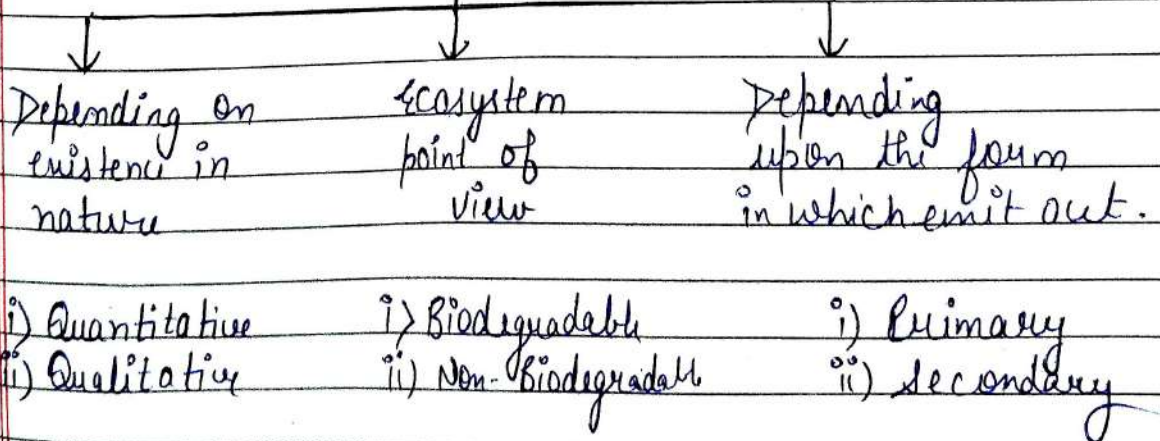
* Air Pollution:- It may be defined as the occurrence or addition of dust, gases, smoke, odour etc into the air which cause bad / adverse effect on human beings, plants, animals & other objects.

* Pollutants:- Pollutants are the substances present in the environment which adversely affect the environment by damaging growth rate of species and adversely affect the human health and comfort.

Classification of Pollutants:-

By three Types

Classification of Pollutants



i) Primary Pollutants:- which are emitted directly from the source and remain in the form in which they are added to the environment.
For ex:- Smoke, dust, fumes etc.

ii) Secondary Pollutants:- which are generated from the primary pollutants by chemical interaction with some constituents present in the environment.

For ex:- Nitrogen oxide, acid rain, photochemical smog etc.

* Sources of Air Pollution:- The following are the sources of Air Pollution:-

i) Stationary Combustion Sources:- During the burning of fossil fuels / coal in industries, houses, thermal plant etc. adds gases & other matter in the air.

ii) Mobile Combustion Sources:- Increase in automobiles, aircrafts etc. these are the largest source of air pollution in big cities. Major pollutants emitted from these are gaseous pollutants, aerosols etc.

iii) Industrial Process:- Processes such as welding, synthesis of chemicals, grinding etc. add gases in the air.

DATE _____
PAGE No. _____

iv) Secondary Air Pollutants:- Acid Rain & photochemical smog are major secondary air pollutants.

* effects of Air Pollution on Human Health:-

- i) Dust & smog cause respiratory problems such as asthma, lung cancer etc.
- ii) High concentration of SO_2 in air cause cough, nasal discharge etc.
- iii) High concentration of NO_2 in air cause internal bleeding, oxygen deficiency etc.
- iv) Lead compounds affect children's brain.
- v) Mercury causes damage to kidney & nervous system.
- vi) Cadmium cause cardiovascular diseases & liver damage.

* effects of Air Pollution on Plants:-

- i) SO_2 causes loss of chlorophyll & yellowing of the leaf.
- ii) NO_2 retard the growth of plants.
- iii) Dust & smoke settle on leaves of plants which reduce sunlight & hence reduce photosynthesis.
- iv) Ozone causes dead area on the leaf surface.
- v) Tiny Plant's (Lichens) growth inhibited in air pollution.

DATE _____
PAGE No. _____

* effects of Air Pollution on Animals:-

- i) Acid rain affects aquatic life.
- ii) High amount of Fluorine results at
- iii) Ozone in air causes irritation & various diseases in dogs, cats & rabbits.
Ozone causes dead area on the leaf structure.
- iv) Ultraviolet radiations causes cancer in wildlife.
- v) Lack of appetite in pet animals due to lead poisoning.

* effects of Air Pollution on Economy:-

- i) Corrosion:- Deposition of acid by acid rain on building roofs, railway tracks, metal on bridges etc damage due to corrosion.
- ii) Damage to Building materials:- Due to acid deposition which reacts with lime stone.
- iii) Damage to Paints & Protective covering:- Due to pollutants like SO_2 , O_3 , H_2S & Aerosols.
- iv) Rubber Cracking:- Due to Ozone & PAN.
- v) Damage of Textile Fibres & Textile Dyes:-
Due to SO_x , NO_x , O_3 .

DATE _____
PAGE No. _____

vi) Damage of Leather & Paper:- Due to SO_2 leather lose

vii) Effect on glasses & Ceramics:- Due to air pollution these show a change in surface appearance.

viii) Damage to Art & Architecture:- Like Taj Mahal damage due to acid rain.

* Control Methods of Air Pollution:-

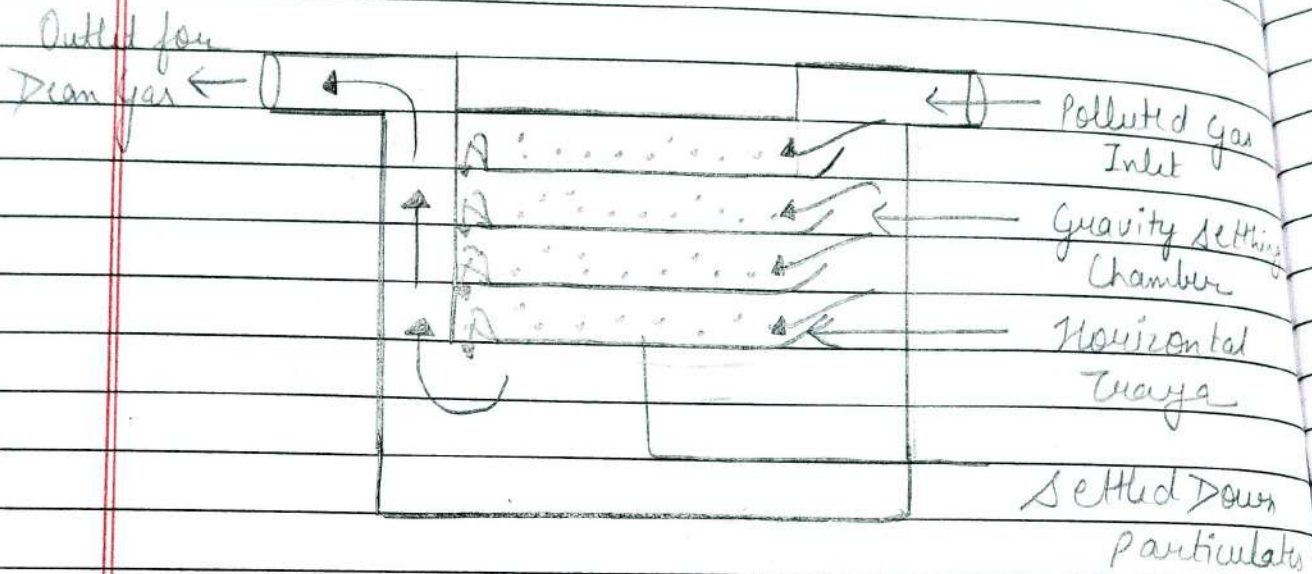
A. Preventive Measures:-

1. Shifting to less polluting fuel such as CNG, LPG etc.
2. Planting more & more trees.
3. Controlling Automobile pollution by the use of efficient engines & catalytic converters in the vehicles.
4. Selection of suitable fuel which reduce amount of pollutants in the emissions.
5. Control of gaseous pollutants through the techniques of combustion at a high temp, absorption & adsorption.

B. Control Measures:-

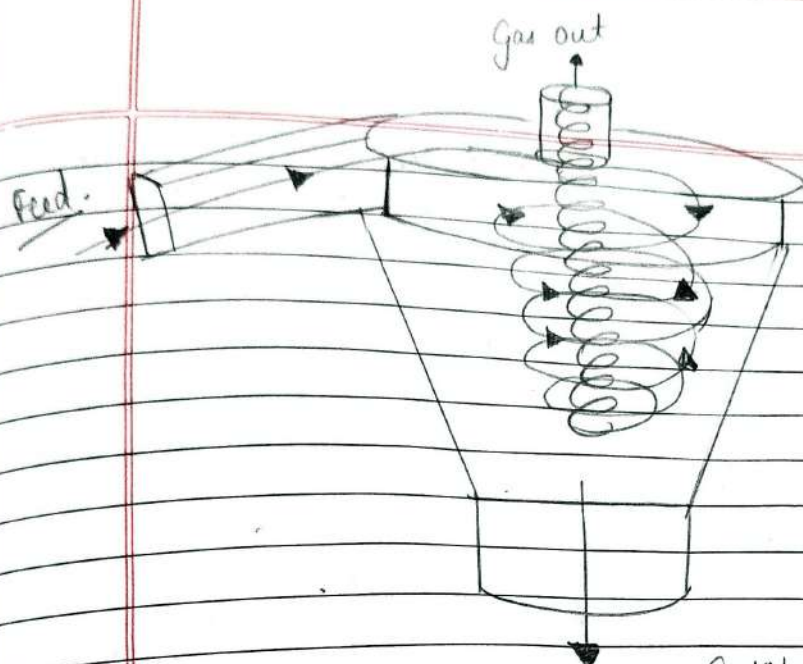
i) Gravitational settling Chamber Method:- It is used to remove the particles exceeding 50 microns in size from the polluted gas. Polluted gas is allowed to enter from one end & velocity

of gas stream is kept less than 0.3 m/s to give time to settle down the particle.

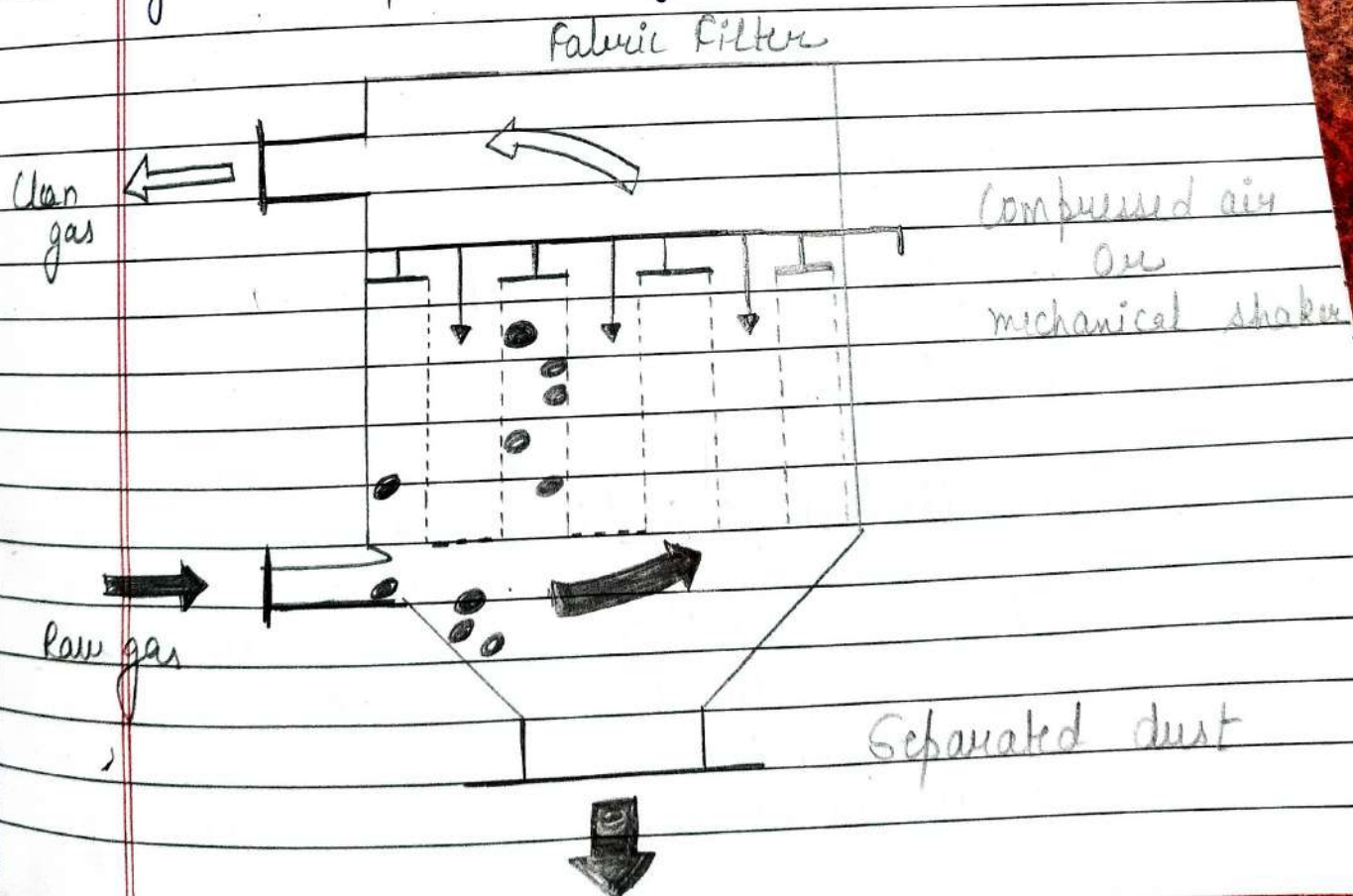


ii) Cyclone Separator Method:- It can remove much smaller particles as compared to gravitational settling chamber method & use centrifugal force to separate matter from polluted gas. Polluted gas enters the separator tangentially & receives a rotating motion & generates high centrifugal force due to which matter is thrown to the cyclone walls & is removed from outlet.

iii) Cyclone Separator Method:-

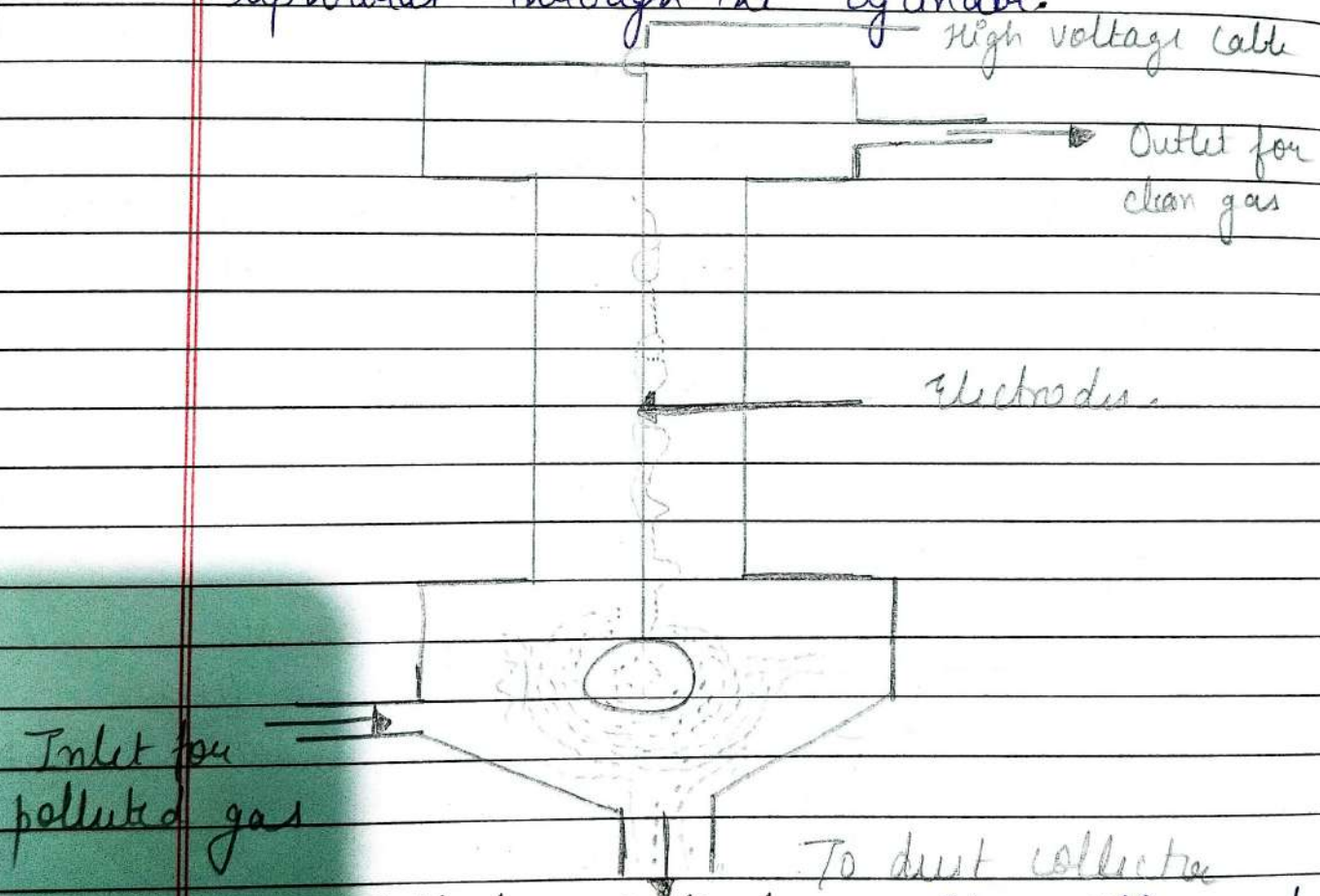


iii) Fabric Filter method :- In this system, polluted gas pass through a fabric which filters the polluted gas & allow the clean gas to pass through.



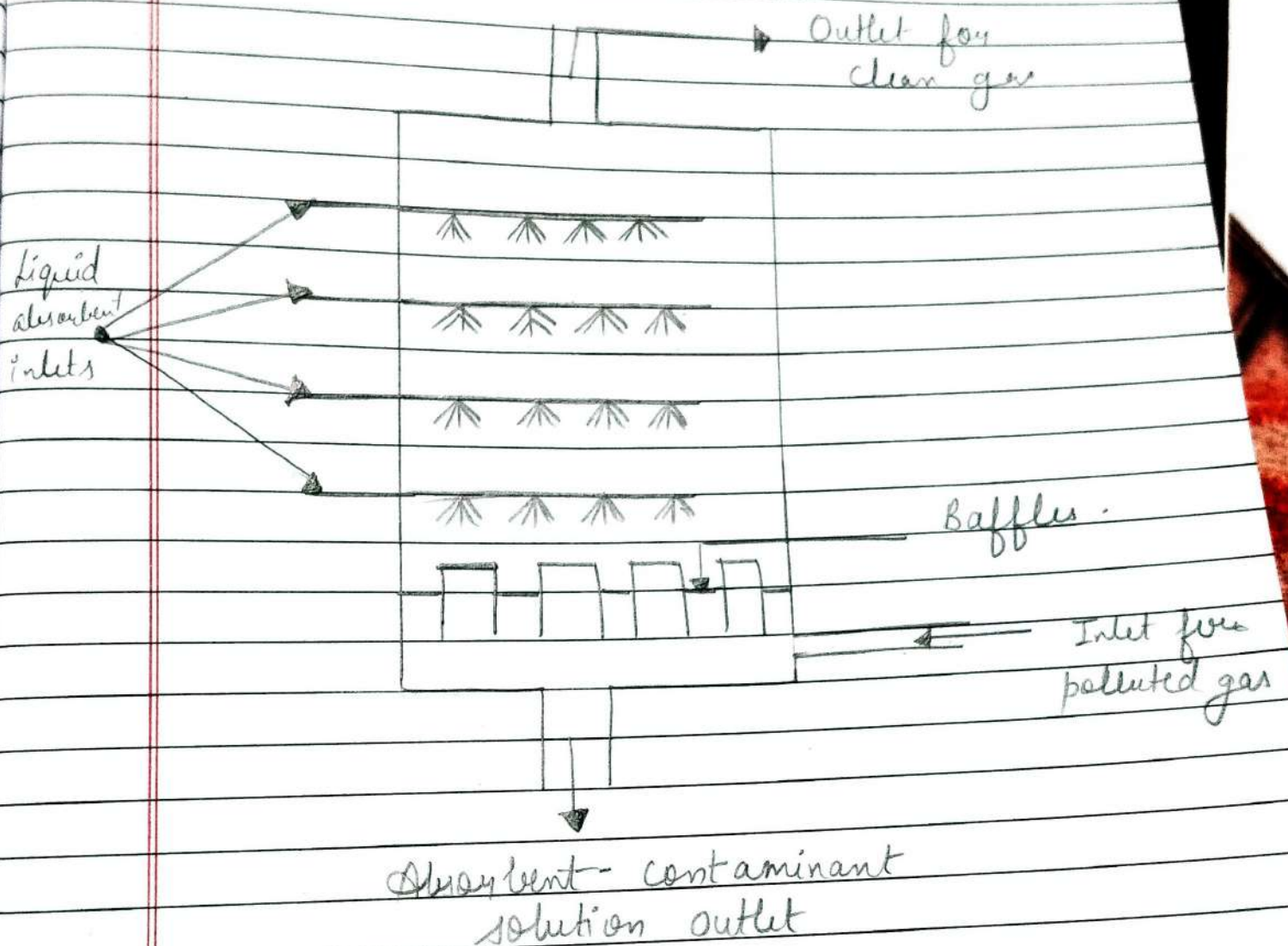
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PAGE No. _____

iv) Electrostatic Precipitator Method - It works on the principle of electrostatic precipitation i.e. electrically charged particles present in polluted gas get separated under the influence of electrical field. Polluted gas enters the precipitator, large size particles settle down & small size charged particles settle on oppositely electrode surface & clean gas rises upwards through the cylinder.



iv) Wet Collectors Method - which utilizes water or any other specific liquid to remove matter as well as gas by absorption/adsorption. Polluted gas passes through spray nozzles. Less than 0.2 micrometer size particles & toxic gases removed by

this method.



Unit 2.

Noise Pollution

A loud unwanted or unpleasant sound that cause discomfort is called noise. The replace of unwanted sound in the atmosphere is called noise pollution.

Unit of Noise pollution is - The unit sound level is decibels (dB). Noise level can range from 1 to 140 than 140 dB.



Sources of Noise Pollution

1) Public place :-

Fish market, Battery market, railway station, bus stand etc.

2) Domestic Equipment :-

Cooler, AC, fan, Grinder

3) Music System :-

like transistor, radio, T.V.

4) Defence weapon :-

tank, gun, bus, truck, aeroplane.

5) Transport Vehicles :-

autos, car, jeep, truck etc.

6) Community function :-

Political, social or religious function like marriage, political assembly etc.

7) Industries :-

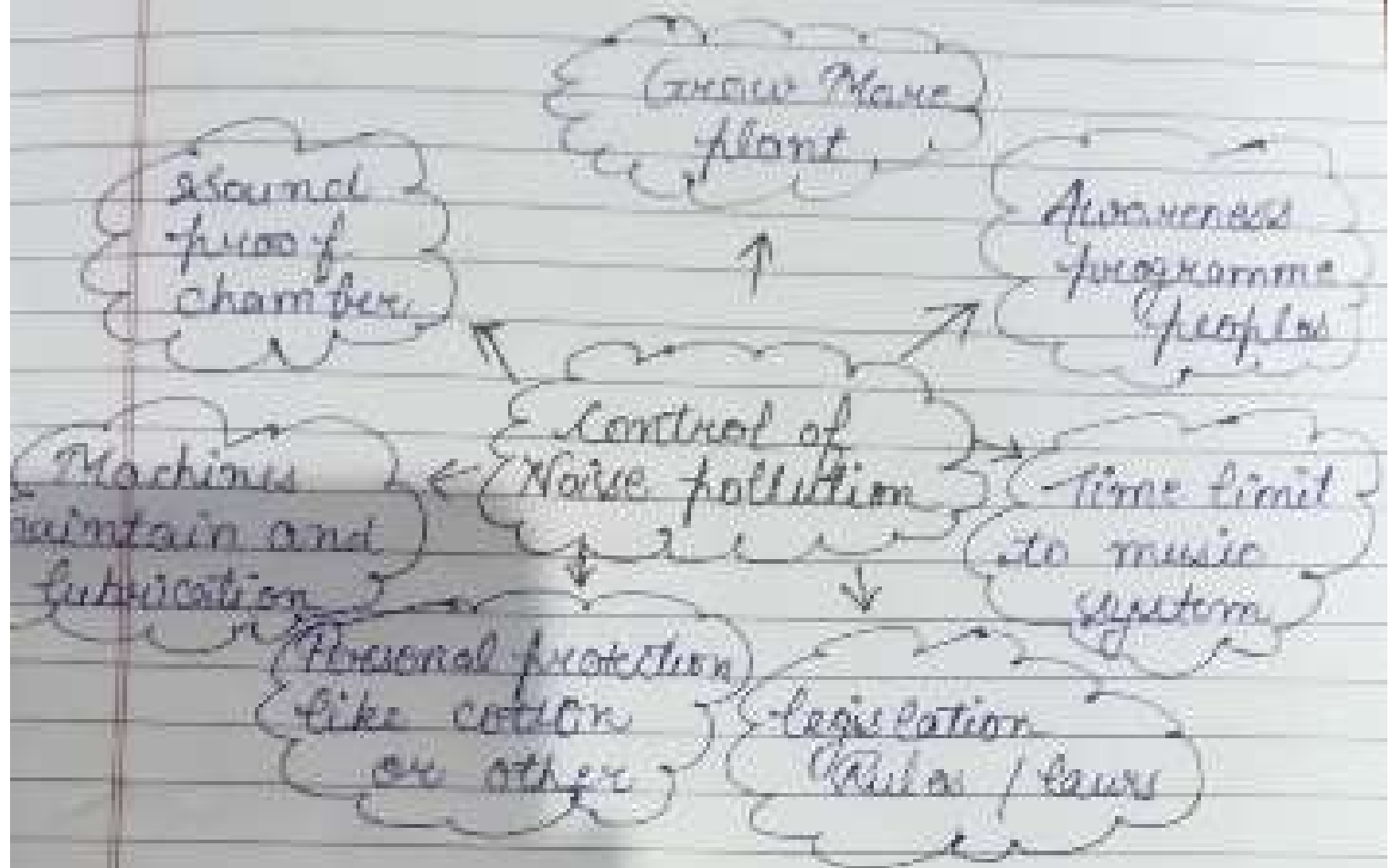
The various machines used in industries cause noise pollution.



Effects of Noise pollution: It has adverse effects on human beings, their environment, natural wild life and ecological system. The following are the effects of noise pollution.

- * Repeated exposure to noise may cause hearing problem.
- * Noise causes irritation and affects sleep and work efficiency.
- * Noise causes headache, thus reducing concentration.
- * Sudden and high intensity sound level affects the nervous system.
- * Noise pollution causes depression and fatigue which considerably reduce the efficiency of a person.

- * Noise pollution disturbs sound and refreshing sleep.



// Controls of Noise pollution:-

Noise [falling] producing industries, railway stations, aeroplanes etc. should be located away from human settlements.

- * Proper lubricants and maintenance of machines can reduce noise pollution.
- * Noisy machines should be installed in sound proof chamber.

- * Quieter machines should be fabricated to replace the noisy ones.
- * Noise by motor vehicles on roads can be reduced by planting several rows of coniferous.
- * The should be silence by planting several rows of coniferous.
- * The should be silent zone around residential areas, educational institutions and hospitals.
- * Use of loud speakers and amplifiers should be restricted to a fixed.
- * Personal protection against noise can be produced by using protection done by stuffing a bit of cotton.
- * Legislation can be ensure (is) is minimised at various social.

Soil Pollution

Soil Pollution : It may be defined as the contamination of soil by some quantity of chemicals/other substances resulting in the reduction of its fertility.

Sources/Cause of Soil Pollution :

1. Industrial Wastes : Mainly discharged from chemical industries, pulp & paper mills, sugar factories, petroleum industries etc. add pollutants to the soil.

2. Agriculture Wastes : Fertilizers, pesticides, insecticides etc. cause soil pollution & affect the properties of soil.

3. Urban Wastes : Include plastics, glass, paper, leaves etc. contribute to soil pollution.

4. Biological Agents : Include biological organisms from human & animal excreta & disposal of waste water cause soil pollution.

5. Radioactive Material : Resulting from explosion which penetrate into the soil & effects on the body tissues.

Solid Waste : It is the solid & semi-solid waste arising from human & animal activities except human excreta.

Classification of Solid Waste :

Types of waste : 1. Bio-degradable solid waste

2. Non Bio-degradable solid waste

1. Bio-degradable solid waste : The waste which can be broken down into harmless substances by the action of micro-organisms. For example : Food waste, garden waste, paper & cardboard waste etc.

2. Non Bio-degradable solid waste : The waste which cannot be broken down by the action of micro-organisms. For example : plastics, tyres, metals & electronic waste etc.

Sources of waste : 1. Municipal solid waste

2. Industrial solid waste

3. Bio-medical solid waste

1. Municipal solid waste : Consists of household waste, waste from streets & roads, waste from construction etc. For example : shoe polish, old batteries, paint tins etc.

2. Industrial solid waste : Major sources are thermal power plants which produce coal ash, sugar mills, pulp & paper industries, fertilizer etc.

3. Bio-medical solid waste : Consists of waste released by hospitals, clinics & treatment of human beings. For example : cotton, syringes, bandage, glass bottles etc.

Effects of solid waste on Human Health & Environment :

1. Smoke due to burning of solid waste produce polluted air.
2. Bad odour due to decomposition of organic solid waste pollutes air.
3. Uncontrolled dumping of waste gives ugly look to the surrounding environment.
4. Contaminated water supply cause diseases like jaundice, cholera etc.

5. Mosquitoes breed on polluted water cause diseases like malaria, dengue etc.

6. Solid waste may choke drains results in water logging.
7. Contaminated water & food cause diseases like diarrhoea.

E-Waste : E-Waste means discarded electronic products such as computers, televisions, cell phones, batteries etc. E-Waste, if not disposed off properly, can leach lead & other substances into the soil & ground water.

Effects of E-Waste on Human Health :

Source of E-Waste	Constituent	Health Effects
Mother-board	Beryllium (Be)	Cause Lung Cancer, Skin Cancer
Computer Housing	PVC	Damage of immune system
Computer monitors	Lead (Pb)	Damage to nervous system
Switches	Mercury (Hg)	Damage to brain & respiratory system

Control of solid waste :

1. Collection of solid waste : Collecting the waste & moving it to the site of disposal site.

2. Disposal of solid waste : Collected waste separated into bio-degradable & non bio-degradable materials & then dispose the bio-degradable materials by micro-organisms.

3. Utilization of solid waste : Non bio-degradable materials are recycle & reuse. The solid waste can be properly utilized to obtain the benefits such as :

(a). Conservation of natural resources

(b). Economic development

(c). Control of air pollution

Methods of solid waste disposal : 1. Landfilling 2. Incineration 3. Composting

4. Pulverisation

5. Pyrolysis

6. Disposal into sea

1. Landfilling : In this method, garbage is spread out in thin layers, compressed & covered with soil/plastic foam.

Advantages : 1. It is simple & economical.

2. It converts low-lying waste land into useful area.

Disadvantages : 1. Large area is required.

2. It leads to bad odour if landfill is not properly managed.

2. Incineration : In this method, solid waste is burnt in a furnace. Combustible material such as dead organism, paper, leaves etc. feeding to incinerators & Non-combustible materials can be left out for recycling & reuse.

Advantages : 1. It is simple & economical.

2. It requires very little space..

Disadvantages : 1. Operating cost is high.

2. Formation of smoke, dust & ashes cause air pollution.

3. Composting : Bio-degradable waste material decompose in the form of compost by the action of micro-organisms & compost can be used for agriculture purpose.

Advantages : 1. It is simple & economical.

2. Recycling can be done.

Disadvantages : 1. Non-combustible materials have to be disposed off separately.

2. The technology has not caught farmers.

4. Pulverisation : In this method, solid waste is pulverised in grinding machine to reduce its volume & physical character. This method is not commonly used in India.

5. Pyrolysis : In this method, combustible substances are heated in a specially designed chamber at 650 to 1000 degree Celsius in low oxygen environment.

6. Disposal into sea : This method is used in coastal area having deep sea water & at a reasonable distance.

Advantages : 1. It is simple & economical.

Disadvantages : 1. Light components of solid waste float on the water surface.

2. This method is not suitable during stormy weather.

Impact of Energy Usage on Environment..

Unit - 4

Global Warming :-

It is the increase in temperature of earth surface (both land & water) & its atmosphere.

Causes of Global Warming :-

Mostly warming occurs from the combustion of fossil fuel in vehicles, factories & electricity production. Main gas responsible for global warming is CO_2 .

Effect of Global Warming :-

1) Increased Melting of Ice :-

Due to global warming the ice is melting at a much faster rate than in the past.

2) Desertification :-

Increasing temp. across world make area more dry and mostly water sources are becoming dry in shortage of water & hence known as desertification.

3) Rise in Sea Level :-

due to melting of ice

caps, the sea level is rising day by day.

4.) Increase in Erosion:-

Melting of glaciers also result in landscape due to erosion.

5.) Damage to Sea Life:-

Due to warming seas and acidification the sea life is getting damage because of formation of Carbonic acid.

Control of Global warming:-

- * Use of renewable sources of energy.
- * Use of eco-friendly fuel like CNG & LPG.
- * Reducing our carbon footprints.
- * Planting of more and more trees.
- * Use alternative sources of energy.

Green House effect:-

The process through which heat is trapped near Earth's surface by substances known as greenhouse gases.

OR

It is a natural process that warms

the earth's surface of atmosphere.

Major Green Gases are:

CO_2 , methane (CH_4),
oxide (N_2O).

Ozone (O_3) and nitrous

Mechanism of Green house effect:

When solar radiation comes to earth atmosphere its absorbed and then emitted back to atmosphere. Due to increase of greenhouse gases in atmosphere, the more heat gets trapped. The light & heat can get into earth's into earth's atmosphere but it can't get out of this so temp. rises.

Ozone layer:

The ozone layer is a region in the earth's stratosphere that contains high concentration of ozone and protects the earth from the harmful ultraviolet radiations of the sun.

Functions of Ozone layer:

This layer protects us from harmful UV rays which are emitted by sun. The UV rays can cause skin cancer, contracts & it also damage our environment system.

Depletion of ozone layer:

Ozone layer is mainly depleted by man made activities especially using man-made chemical such as CFCs, HCFCs, etc. The chemical which deplete ozone layer are known as ozone depleting substances (ODS). ODS are stable in nature & non-toxic chlorine & bromine deplete ozone at supersonic speed (speed exceeds speed of sound). Chlorine atom can break thousand of ozone molecules.

Effects of ozone layer depletion:

1.) Damage to human Health:

By this humans will be in contact to UV rays, Exposure to strong UV ray cause skin cancer, contract. It also cause throat vibration, congestion & chest pain.

2.) Damage to animals: Exposure to UV ray can lead to skin & eye cancer in animals.

3.) Damage to plants:

Growth is disturbed, photosynthesis rate may also slow down.

4) Threat to Marine life:- In marine life plants are affected by UV rays which is directly affect food chain.

5) Impact on certain Materials:- Many materials get degraded when they come in contact to UV rays. rubbers elasticity gets destroyed, plastics, wood & certain fabric also gets degraded.

Solⁿ to prevent Ozone layer Depletion:-

- * Avoid pesticides
- * Prohibit the use of Nitrous oxide (N_2O)
- * Using environment friendly cleaning products.
- * Decreasing Deforestation.
- * Int. prot. Vehicles.

Say No to pesticides:-

Pesticides are useful for crops but they are great source of Ozone depletion, So must use eco-friendly chemicals to protect the crops.

Discourage Driving of pol. vehicles:-

Vehicles run they emit green house gases when fuel burns & should minimize use of pol. vehicle.

prohibit the use of Nitrous oxide (N_2O)

Nitrous oxide destroys ozone layer as these oxides get break down.

Using Environment friendly cleaning product

Mostly cleaning products are made up of harsh chemicals. & these chemicals degrade ozone layer we should use Natural & organic eco-friendly cleaning products.

Acid Rain

It is defined as deposition of acids components in the form of rain, snow etc.

OR

Acid rain means presence of excessive acid in the rain water.

How acid is formed

Various automobiles & industries release oxides of Nitrogen, Sulphur & carbon into air. These oxides react with water vapours present in air & then converted into strong acids like H_2SO_4 , HNO_3 & H_2CO_3 (Carbonic acid). As rain come these acids fall down on earth as acid rain. The pH of acid rain is 6/4.

Types of Acid Rain

Acid Rain



Dry Acid Rain

dry deposition refers to acidic gases & particles.

Wet acid Rain

wet deposition surface of acid rain. As this acidic water flows over & through ground it affects variety of plants & animals.

OR

its oxides of S, N deposited on surface of buildings, plants soil etc. which are directly attack buildings materials.

Wet acid rain is characterised by acid rain, snow, dew, fog etc.

Areas of Acid Rain

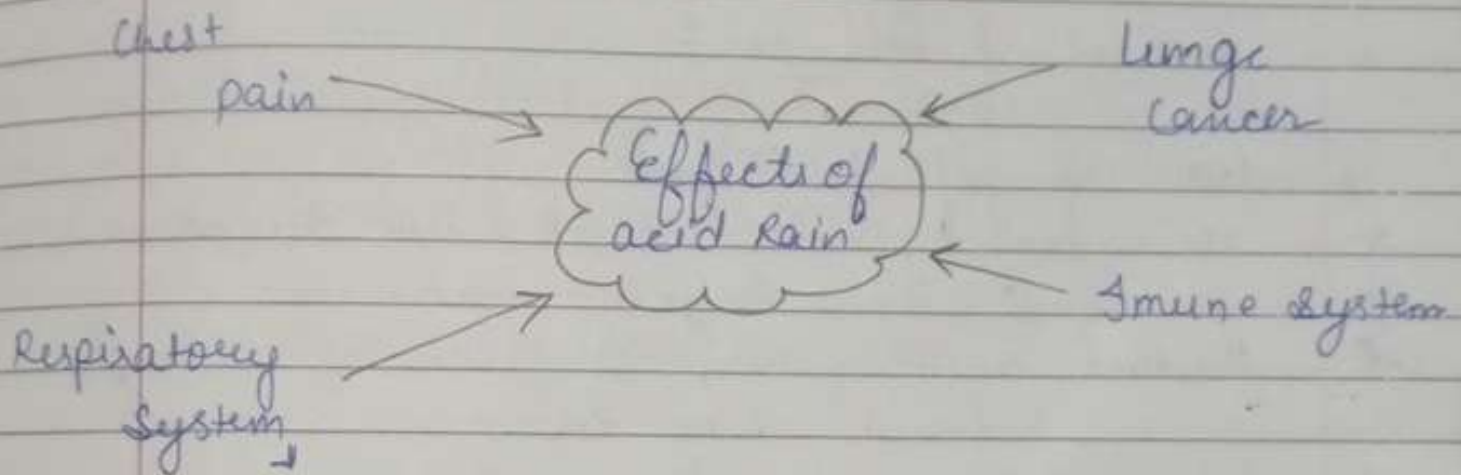
It mainly occurs in thickly populated cities & in mainly industrial area & industrialized countries.

Harmful effects of acid rain

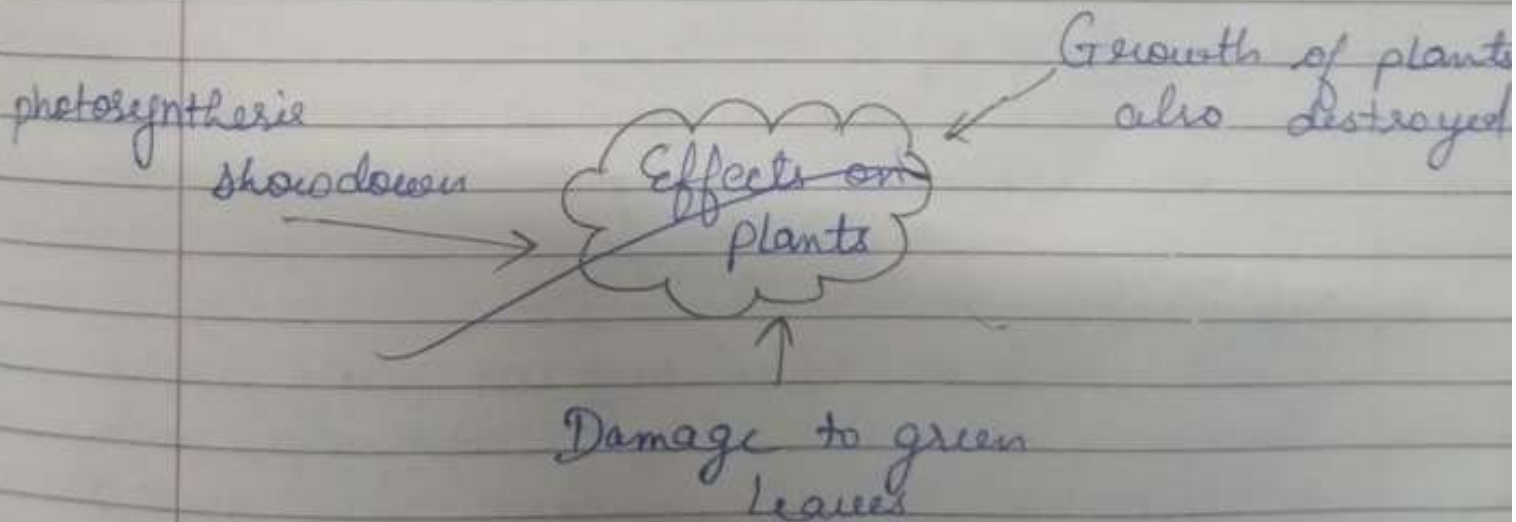
- * It damages green leaves & hence forests.
- * photosynthetic rate also slow down.

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Page: _____
- * It damages buildings materials, statues & bridges.
 - * automobiles coatings also get decaying
 - * Rate of corrosion of metal accelerates
 - * Bacteria of green algae are killed.

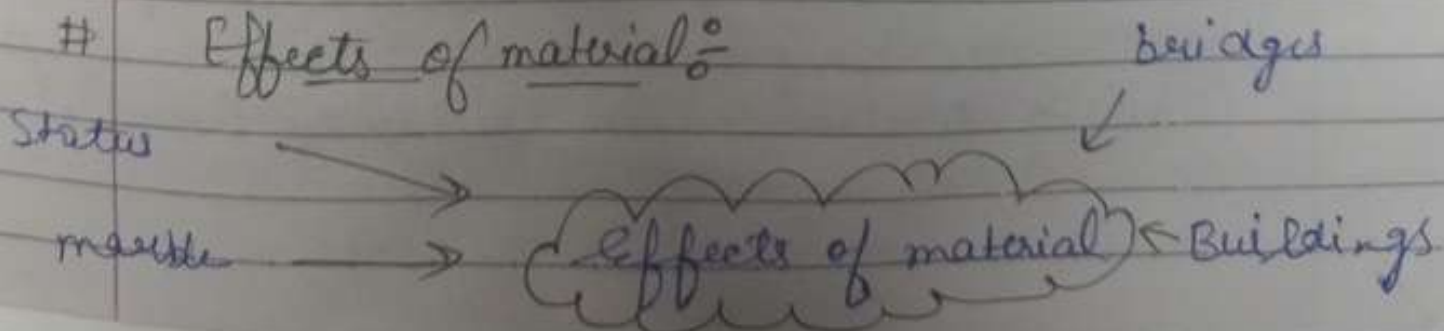
Effects of acid Rain (Human Health)



Effects on plants



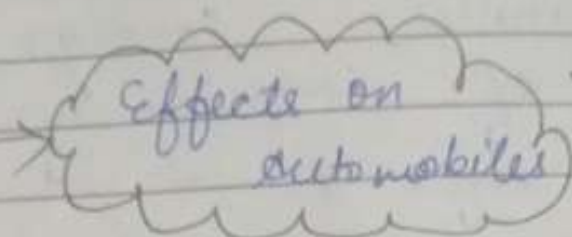
Effects of material



Effects on Automobiles:-

Coating gets damaged

corrosion rate increase



Effects on Soil:- nutrients get destroyed.

Control of acid rain:-

- * Ltd. use of fossil fuel.
- * use fuels which create / less air pollution.
- * Reduce & Recycle materials
- * Reduce amt. of SO_2 & oxides of Nitrogen released into air.
- * fit scrubbers into factory's chimneys
- * liming of soil to reduce acidity.

Green Buildings:-

Also known as green construction or sustainable buildings.

Definition:-

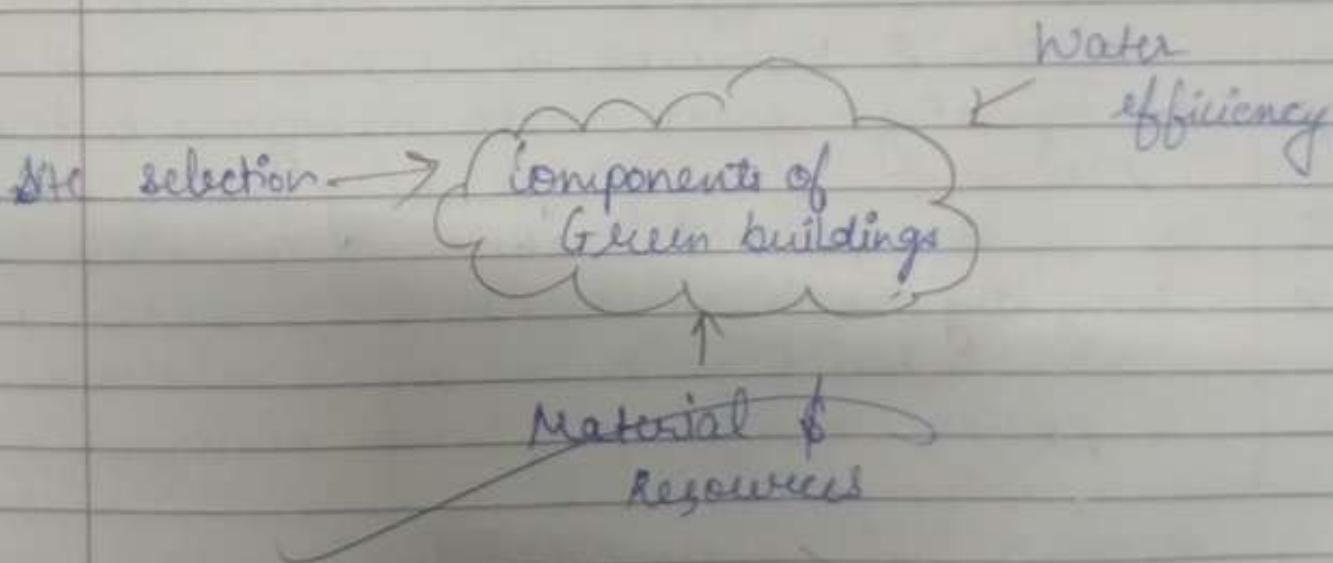
It is one which uses less water, which conserve natural resources, optimize energy efficiency, which generates less waste & provides healthy space for occupants as compared to conventional buildings (IGBC $\rightarrow$ Indian Green Building Council).

Objectives of Green Buildings:

- * Efficiency using energy, water & other resources.
- * Reducing waste pollution & environmental degradation.
- * protecting occupant health & improving employees productivity.

Green building refers to a construction design, planting & decor using environmental friendly approach.

Components of Green buildings:



Site Selection:

The site should have easy availability of public transport & convenience to cut down energy consumption for transportation. Site should consider local vegetation, natural water sources.

Material & Resources:-

- * Suitable construction materials are chosen with zero toxicity, high recyclability, low emission of harmful gases.
- * Utilization of renewable material such as bamboo flooring, wool carpet.
- * Alternative materials can be generated from waste with lesser energy.
- * Recycle & Reuse construction material & demolition material.

Water Conservation:-

- * Install water efficient flow equipment in kitchen & bathrooms to reduce use of water.
- * Incorporating waste water management technique like dual plumbing for using recycled water.
- * Use water plant & trees as consumable water.
- * Integrating rain water harvesting system in buildings to ensure maximum possible utilization of rain water.

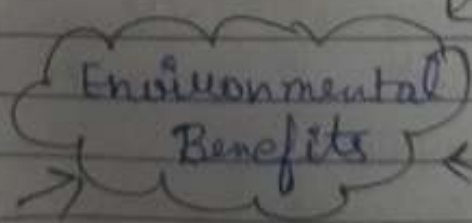
⇒ Benefits of green Building:-

Reduce waste of water

Improve air & natural city.

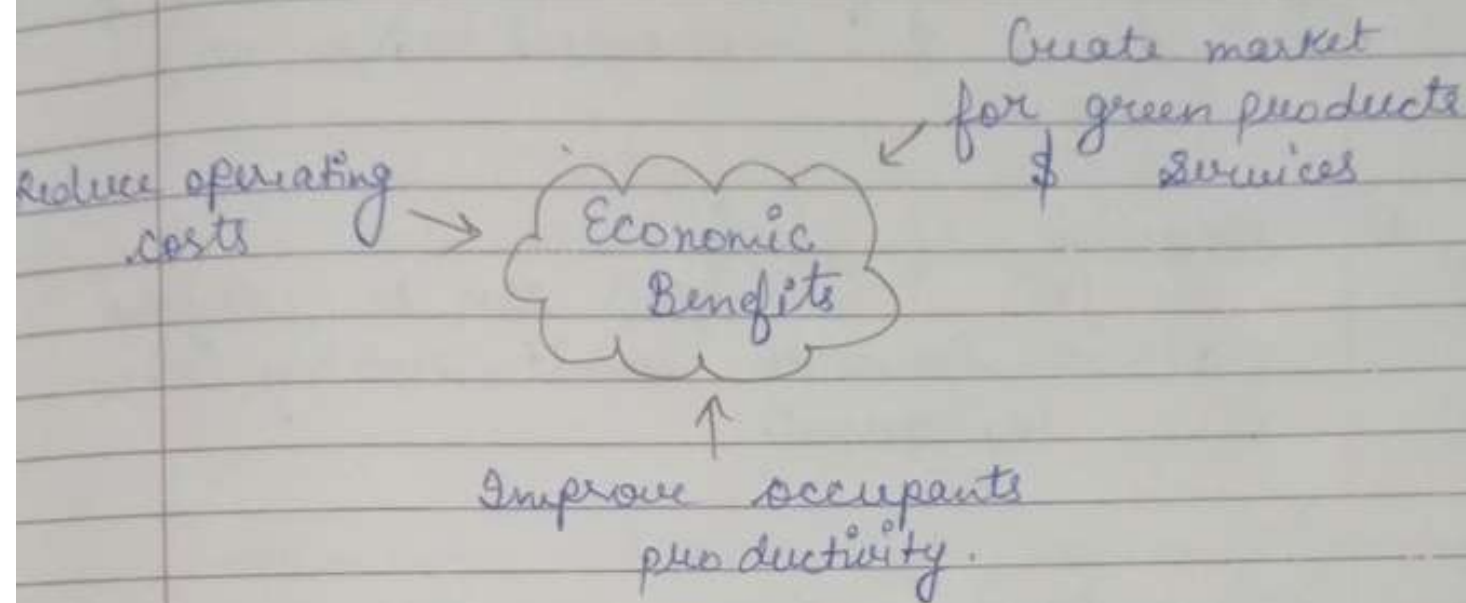
Conserve natural resources

protect biodiversity & ecosystem

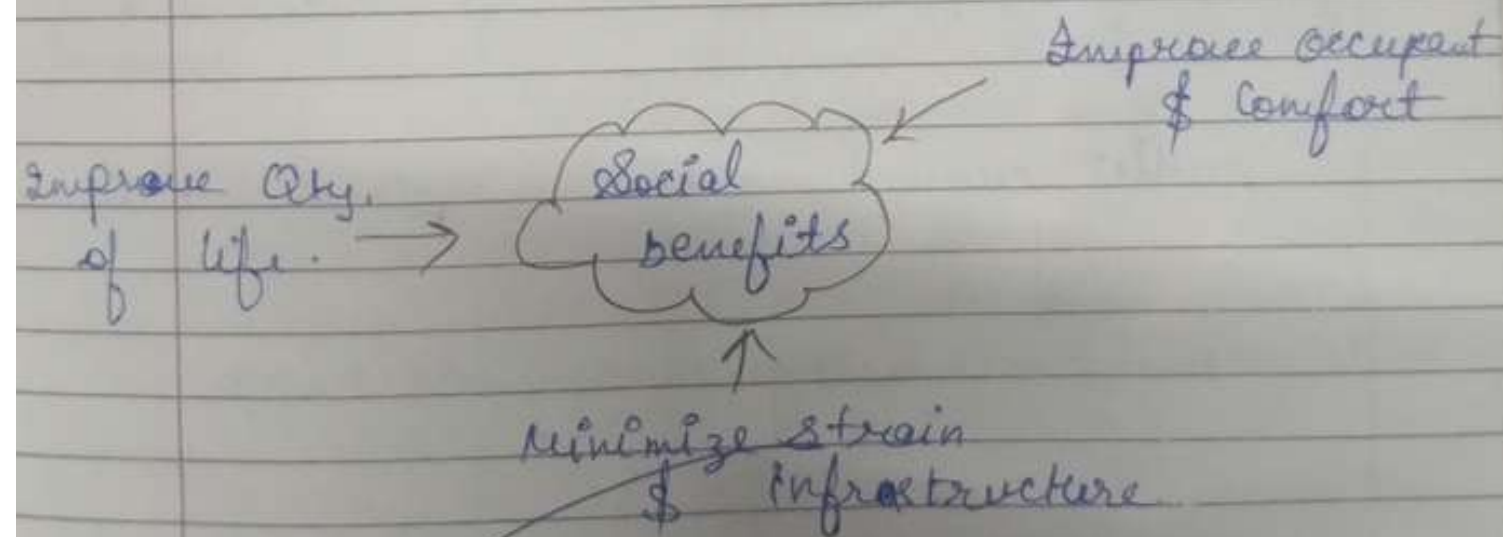


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Economic Benefits:-



Social Benefits:-



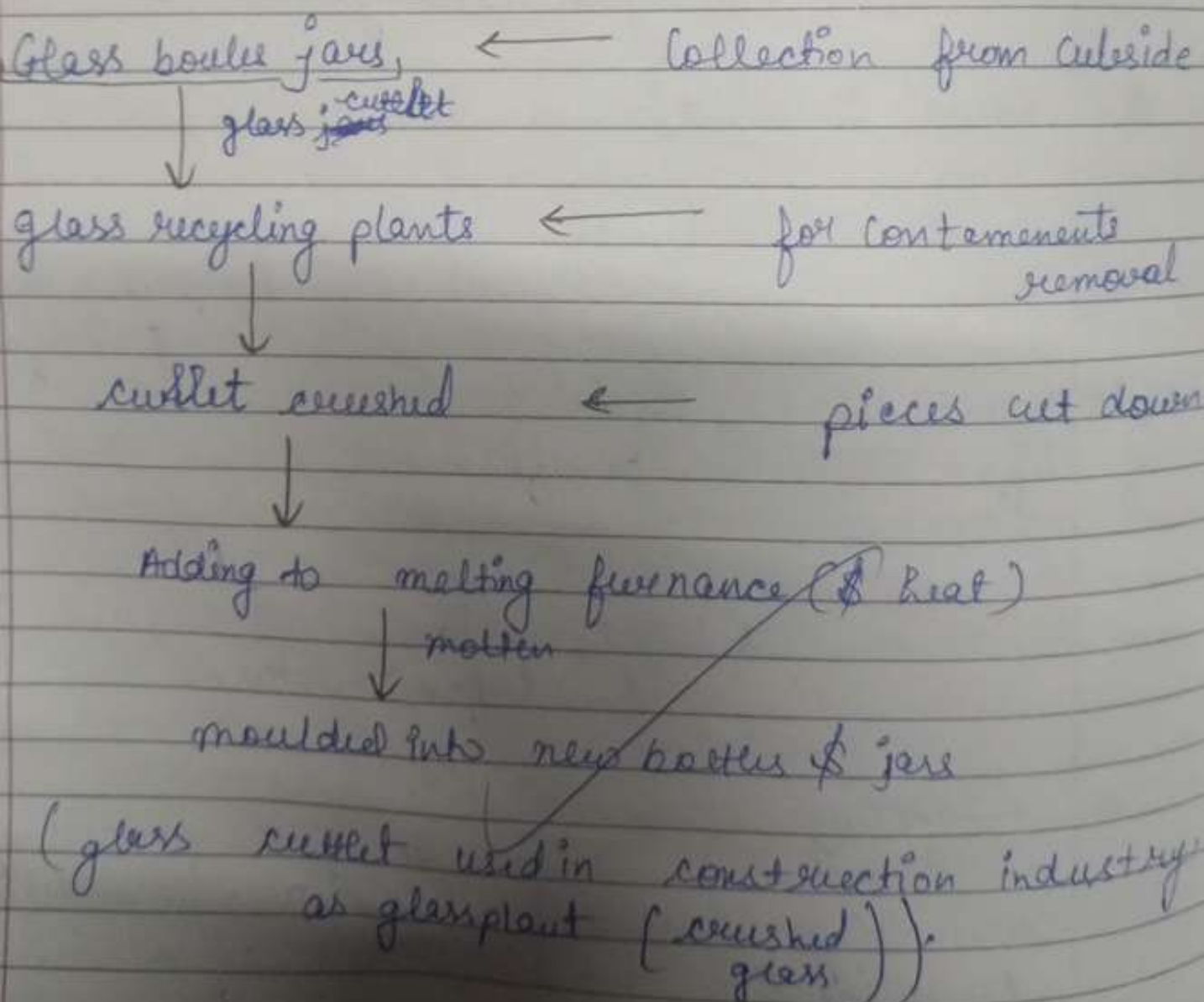
Recycling of materials:-

It is the process of converting waste materials into new materials. Recycling is imp. component of modern waste management technique (3Rs - Reduce, Reuse, Recycle) (3R refers repurpose). materials which are to be recycled are

either brought to collection entire picked from sides of road & then cleaned & cleaned & reprocessed into new materials.

Recycling of glass:-

Glass can be recycled as its structure doesn't destroy when reprocessed.



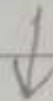
Recycling of aluminium

It is mostly widely recycled materials.

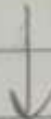
Aluminium is collected



cut into small pieces



pieces are melted in aluminium smelters (furnance)
(High temp)



Molten Aluminium produced



Processed from new materials.

Recycling of aluminium saves 95% energy cost of processing new aluminium. Energy saved by recycling 1Al. is enough to run a TV 3hrs.

Recycling of Copper

Copper is also 100% recyclable without loss of Qty.

Copper is collected



Method is furnace (H)

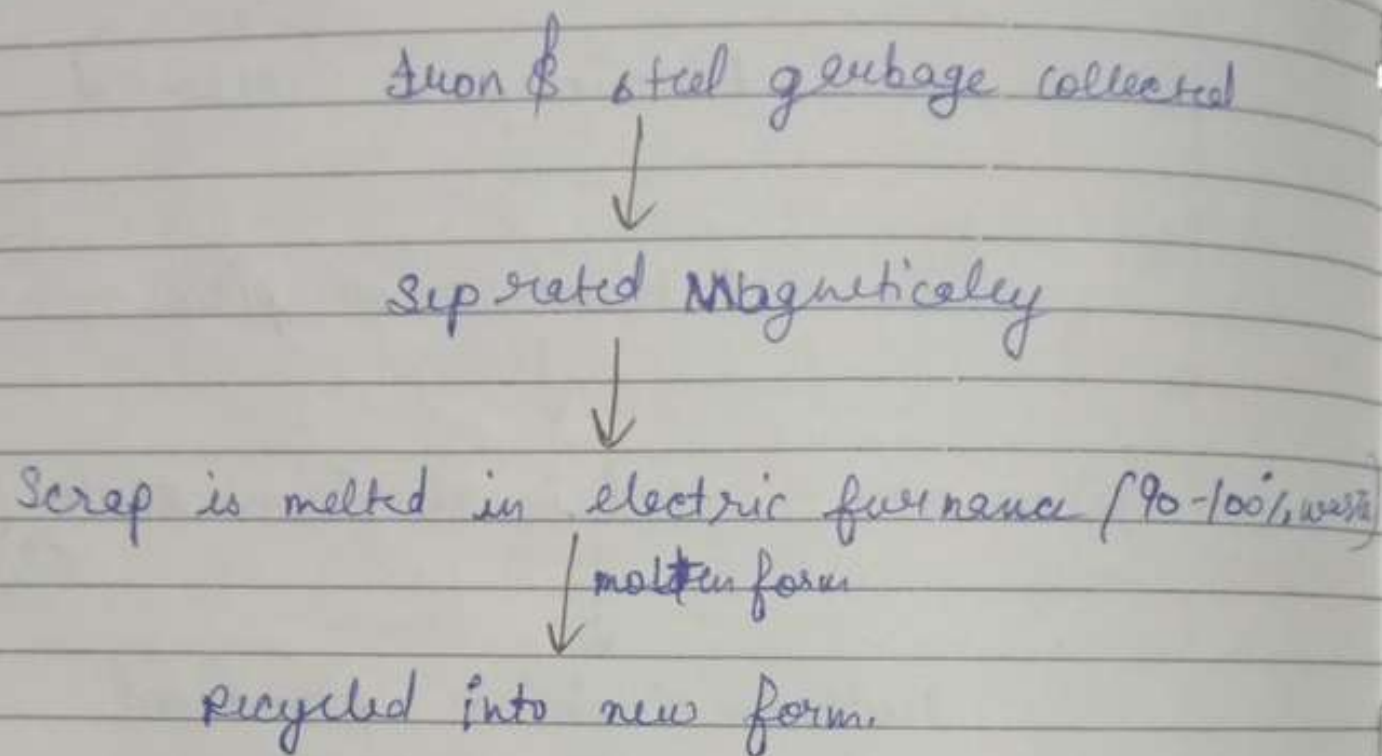


melted form

processed in new form.

Date: _____
Page: _____

Recycling of Iron & steel -
world's most recycled materials.



(42% of recycled steel is produced from crude impure steel).
(scrap is left over from product manufacturing of vehicles, buildings supplies).

Recycling of timber -

Timber recycling is popular due to its eco-friendly products. purchasing of recycled wood will reduce demand of green timber. No more trees will not be cut down. Recycled timber is used in construction products. It is used in buildings houses & for making furniture.

Advantages of Recycling:-

- * Minimizes pollution
- * protects environment
- * conserves natural resources
- * minimize global warming.
- * Increase economic rate of country.
- * Reduce energy consumption.
- * creates job opportunities.

Disadvantages of Recycling:-

- * Recycling sites are unsafe, unhygienic, bad look.
- * Recycling not so widespread on large scale.
- * recycling plant setup cost high.
- * recycling products not so durable.

Ecofriendly materials:-

It is a material that is not harmful to environment.

OR

The materials that has been designed to do the least possible damage to environment is called eco-friendly materials.

Eg - bamboo.

properties of eco-friendly materials:-

Renewable sources

Local availability

Reduction in air & water pollution

Energy conservation.

Durability & Life span

Recycle

Carbon credit:-

It is permit that allows the owner the owner to emit only a certain fixed amt. of CO_2 or green house gases.

1 Credit = 1 tonne of CO_2

It is tradable permit scheme.

Good of Carbon credit:-

It is the reduction of emission of CO_2 or other gases from industrial activities to reduce effects of global warming.

Types of carbon credit

Voluntary Emission Reduction
(VER)

Certified Emission Reduction
(CER)

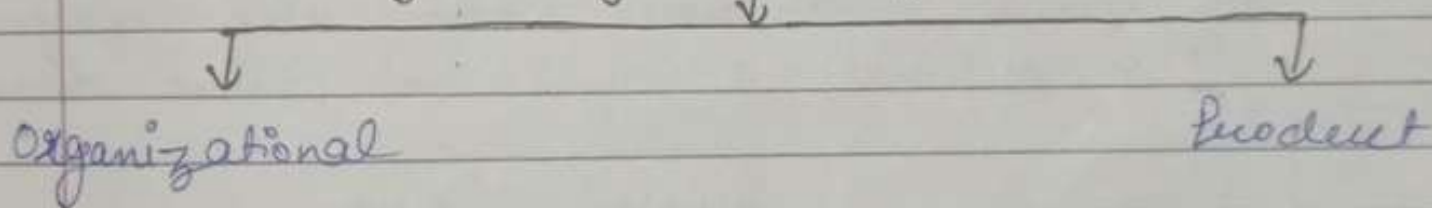
It is carbon credit that is exchanged in the over the country market for credit.

Emission credits created through a regulatory framework with the purpose of offsetting project emissions.

Carbon foot print :-

It is the total amt. of greenhouse gases that are generated by action of individual, organization or country.

Types of Carbon footprint :-



Emission from all activities across the organisation such as energy, industrial process & company vehicles.

Emission from extracting of raw material & manufacturing right through to its use & final reuse.

Steps to Reduce Carbon footprint :-

- * Use renewable or green energy.
- * Reduce your meat & dairy consumption.
- * Reduce & resolute your transportation.
- * Install solar light.
- * Adopt 4R's → reduce, reuse, recycle & recover.
- * Planting more trees.
- * Avoid products with lots of packaging.

Unit : 5

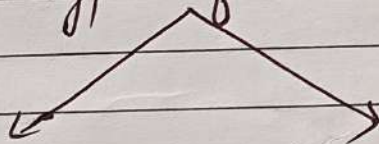
Disaster Management.

Disaster :-

Disaster is defined as sudden adverse or unfortunate event which cause great damage to human life, environment and economy. [Disaster Management] (Or.)

A sudden ecological phenomenon of sufficient magnitude which will require an external assistance is called disaster.

Type of Disaster



Natural disaster

- Caused by natural factor
- eg → flood, cyclone

Man-Made disaster

- Caused due to mind less human activities
- eg → fire, accidents.

Natural

- Flood
- Cyclone
- Earthquake
- Landslides

Man-Made / Artificial

- Fire
- Industrial Pollution
- Nuclear disaster
- War & Terrorism
- Accident → Rail, Air, Road
- Structure failure
- Biological disaster
[Biological warfare]
epidemic Pandemic

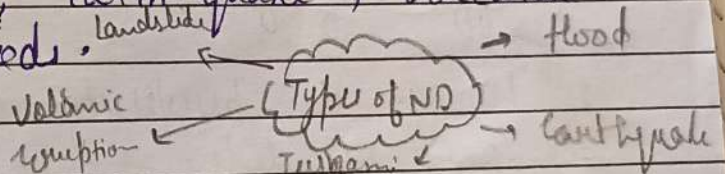
Natural disasters - A natural disaster is a damaging event caused by natural forces, such as severe weather, earth-quake, volcanic eruptions and floods.

1. Floods -

Flood is an uncontrolled flow of water over a least area due to heavy rain fall or sudden snow melting.

Or.

A flood is body of water overflowing the river channels.



3

DATE _____
PAGE No. _____

Types of floods-

1. Flash
2. River
3. Coastal

Cause of floods-

1. River bank erosion and silting of river beds.
2. Snow melt.
3. Deforestation
4. Landslides causes obstructions to flow and change in river course.
5. Cyclone and heavy rainfall.

Effect of floods-

1. Damage to property like houses, buildings.
2. Loss of life.
3. Loss of plant life.
4. Reduction of soil fertility
5. Destruction of crop.

Control of floods- # Control of Cyclones-

- | | |
|-----------------------|--------------------------|
| 1. Afforestation | i) Cyclone shelters |
| 2. Bank stabilization | ii) More trees grown |
| | iii) Regulating land use |

4

2. Cyclones - It is defined as any large system of where wind in atmosphere that rotates about a center of low atmosphere pressure with a speed over 100 kmph. It moves like spinning top. Cause of cyclones -

- # Effect of cyclones -
- # Influence of the sea bed.
 - # A fall in the atmospheric pressure over the sea surface.
 - # effects of wind.
 - # Warm temp at sea surface.
1. Damage to property.
 2. Loss of life.
 3. Crop and flood supplies destruction.
 4. Communication - electricity towers may pull down.
 5. Reduction of soil fertility.

Cyclone is known by different names like -

- Hurricanes in Atlantic and Pacific western area.
- Typhoon in western Pacific.
- Willy-willy at coasts of Australia.

3. Earthquakes - A earthquake is sudden shaking of earth's surface.

Or,

The shaking of earth's crust block due to movement of plates and their rock along a fault in earthquake.

Richter scale measures the energy released

by an earthquake.

Effects of earthquakes:-

- Land sliding in hilly areas.
- Damage to bridges, dam, roads.
- Loss of life.
- Loss of plant and animals life.

Causes of earthquakes:-

- Volcanic eruption
- Movement of tectonic plates inside earth.
- Underground nuclear testing.

Control of earthquakes:-

- Construction in seismic-prone area must
- seismic resistant materials.
- Providing education of earthquake safety.

4. landslides:- The down slope movement of soil, rock and organic materials under the effect of gravity is called landslides.

Causes of landslides:- Control of landslides:-

- | | |
|---------------------|---|
| • Deforestation | • Improving drainage |
| • Leaks in dams | • Reducing the angle of slope |
| • Mining activities | • Excavating the unload the top of slope. |

(6)

- Road construction activities
- Erosion of soil due to heavy rainfall
- Weathering of rocks
- Leaks in reservoirs
- By human activities.

Effects of landslides-

- Crop affected
- Rivers may be blocked, cause flood.
- Damage of structure and property.
- Blockage of roads, cause transportation problems.
- Loss of life.

Cause of Biological disasters-

- Loss of life, injuries
- Damage to property.
- Social and economic disruption
- Environmental damage.

Man-Made Activities-

Man-made disasters have an element of human intent, negligence or error involving a failure of a man-made system, as opposed to natural disasters resulting from natural hazards.

fire disaster
structure failure
(bridge & building)
War & Terrorism

Type of
Man-Made
disaster

tourism
biological disaster
Nuclear disaster

1. Accidents (Air, sea, Rails and Roads) :-

Accidents are sudden, unexpected incidents causing severe loss of life and properties. Big accident causing loss of life and property become disasters.

Characteristics of accidents :-

1. Can have limited or widespread effect.
2. No warning
3. Usually violent in nature.
4. Speed of occurrence usually rapid.

Cause of accidental disaster :-

1. Lack of knowledge and ignorance of loading regulation and highway code.
2. Displacement lose contact with control tower and plane markers.
3. Overturning of boat due to sea disturbances or heavy wind.
4. Road accident cause of human life and money.

2. Structural Failure (Building and Bridges) :-

Damage and collapse of any type of structure for reason such as excess weight in public places bridge etc are known as structure failure.

Cause

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- 5.

Cause of structure failures

1. Bad design
2. Poor quality of material
3. Weak foundation failure
4. Extra ordinary load.
5. Natural disaster
6. Bad workmanship.

Effects of structural failure-

- | | |
|-------------------------|--|
| 1. Injuries | <u>Control</u> :-
1.) Qty. control in construction
2.) Regular inspection & maintenance
3.) Advancements in technology & materials. |
| 2. Structural damage | |
| 3. Environmental damage | |
| 4. Loss of building | |
| 5. Money waste. | |

3. War and Terrorism

The conflict and violence between two countries, religion or communities is known as war and causing disaster.

The use of war / force or violence against person or property in violation of criminal law is terrorism.

Types of terrorism attacks

1. Hijacking
2. Kidnapping
3. Use of chemical nuclear weapons
4. Cyber attacks
5. Threat of Terrorism

Disaster Preparedness:-

Disaster preparedness is a set of steps or measure undertaken by government organisation to better understand and cope with immediate effects of disaster.

Phases of disaster preparedness plans:-

1. Identify type of emergencies.
2. Responsibility and training phase.
3. Evacuation and training phase.

Prediction, early warning and safety measures of disaster:-

1. Seismic sensors and vibrational sensors for maintaining earthquake.
2. Radar maps to detect signature "hook echo" of tornado.
3. Flood sensors to measure moisture levels.
4. Wild fire sensor for detecting traces of smoke and fire.

Early warnings:-

Warning systems are means by which people receive relevant and timely information prior to a disaster in order to make decision and take action.

Count
of 6.0

- i) Hazard
- ii) Four
- iii) Dis
- iv) Bur

Saf

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2. M
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4. T
5. I

6

7

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status

my vehicle
Daily order

Early warning system is integrated system of C.D

- i) Hazard Monitoring
- ii) Forecasting and prediction.
- iii) Disaster risk assessment
- iv) Preparedness activities.

Safety measure for disasters:-

1. Stay informed.
2. Have a plan for evaluation.
3. Building be declared safe before entered.
4. Keep emergency kit on hand.
5. Do not touch any exposed cable or electric wire.
6. Do not play children to play in contaminated sand.
7. Listen to radio or T.V for latest information

Psychological Respond & Management :-

The phenomenon of psychological & physiological responses to emotional stimuli is psychological response & management.

Types of Psychological Respond & Management :-

Trauma ← Rumor

Psychological Respond & Management

Stress

Panic

Trauma :-

It is a powerful shock that may have long lasting effects. The term 'psychological trauma' describes a condition in which a person has experienced a difficult event that event has wounded his psychology.

Trauma can be in 3 steps / stages :-

Shock stage

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(12)

DATE _____
PAGE No. _____

Shock Stage

Recovery stage

Trauma

Suggestible stage

Shock stages -

Frequently he is unaware of the extent of his injury & tends to wonder about himself. The victim finds himself unable to make more than minimum efforts at aiding himself or others.

Suggestible stage -

On the stage individual become passive, suggestible & willing to take directions from rescue workers or others less affected than himself.

#

Recovery stage - Individuals gradually regains his psychological equilibrium of and with the help of mild supportive psychotherapy at a hospital or other aid centre.

Stress -

It is the body's response to a situation or an environment that is unwelcome, unwanted, unengraved, & unplanned.

emotional

Environment

Stress

gross
physi

Physical

Chronic

Acute

Effects of stress :-

Effects :-

Physical

Headache

Sleep problem

Chest pain

Difficult breathing

Emotional

Depression

Excitation

Inward

Twistation

Earthquake is measured by Richter scale.

#

Rumor :-

It is news based upon half truth which floats from one person to another.

Greater psychological distress.

Rumor effects → lower morale

The organizational attitudes

#

Panic :-

It is a sudden fear which dominates or replaces thinking & affects group of people or animals.

Chest

Pain.

Dizziness

Nausea

Symptoms of panic attack.

Sweating

Anxiety

Tremor