Ch-5

Environmental Effects

Regd. No.

Environmental pollution :- Any undesirable change of the physical, chemical or Biological characteristics in the air, water and land which is harmfull to man directly or indirectly through his animals plants industrial or unit or some materials is called as environmental pollution.

Environmental pollution can be catagories into two types:-

(i) Natural pollution :- It originates on natural pollution.

Ex → Volcanic eruption, flud, radio active substance, Pollengrains of flowers, forest fire and coal mine fire, excreta of animal Bacterial decomposition of agricultural matter.

~~Bacterial decomposition of agricultural matter:-~~

(ii) Artificial pollution :- It originates from the activities of man. Environmental disturbation by man is attributable to three major factors.

(i) overpopulation
(ii) urbanisation
(iii) Industrialisation

Pollution means :-

(i) The presence of anything in environment in ares of requirement amount anything put into environ in its nature

(ii) Direct or indirect change one or more components which are harmful for leaving organisms.

Pollutants :-

-> Pollutants are Chemical biological or physical agent that exert undesirable effect ~~or~~ on living organisms ~~incl~~ including human health, environment or belongings.

A/c to "The indian environment protection act, 1986"; Pollutants has been defined as any Solid, liquid or gasious substance present in such concentration as may be or may tend to be injurious to the environment.

(iii) Segrate smoke contents about 2% of (Co) due to incomplete combustion of Tobacco.

(iv) Carbon monoxide is generated during several operations in iron and steel industries.

Harmful effects of (Co) Carbon monoxide :-

(i) During breathing the ~~from~~ haemoglobin ~~Com-~~ present in the red blood cell Combine with O_2 to form ~~oxy~~ oxyhaemoglobin. The oxyhaemoglobin travels to different parts of the body through arteries to give up oxygen and take up CO_2 in return which is exhaled. In case the air we breathe contains Co it combines with Haemoglobin and form Carboxy ~~Hemo~~ Haemoglobin (HbCo) due to which the quantity of oxygen available to the body cells get reduced and which causes "anoxia" the difficiency of oxygen produces headache, dizziness, choking, Cardiac arrest, paralysis, etc.

Oxides of (sox) Sulphur :-

(i) Source :- 6% of the total volume of SO_2 present in atmosphere is released by volcanic eruption and rest 33% is discharged due to human activity

(II)
(a) Forest fire :-

(b) Man-made Source :- Incomplete Combustion of fossil fuels of

(ii) Solvents used in industrial operations escape into air due to evaporation.

Effects:- (i) Hydrocarbons are it Causes Cancer.

(ii) It harm plants Causing ageing, Shedding of leaves, flowers etc.

(iii) Methane traps 20% more heat than CO_2 and thus became Important green house gas.

(5) Particulates or suspended particles :-
Particulates refers to all atmospheric Substances that are not gases i.e, they are minute Solids or liquid droplets. The Size of particulates may range from 0.0002 μ diameter to 500μ ($1\mu = 10^{-6}m$)

Source:-

(a) Mist :- These are those particles that are produced by Spray liquid and formed by the Condensation of vapours in air.

ex:- Insecticides, herbicides.

(b) Smoke :- These are produced by burning and combustion of organic matter. Oil smoke, tobacco smoke and Carbon smoke are their examples.

(c) Fumes :- These are Condensed Vapours. These are generally released in chemical or metallurgical process.

(d) Dust :- These are fine particles formed by natural process like disintegration of rocks by mechanical process.

Effect :-

(1) Effects on human beings :-

Oxides of nitrogen (NOx) :-

Source :-

(i) Natural source :- (i) Thunderstorm
(ii) Bacterial decay of organic matter

(ii) Man-made source :- (i) Combustion of fossil fuel such as coal oil, natural gases. etc.

(ii) Chemical Industries

Effects :-

(i) NO_2 is extremely toxic to leaving tissues.

(ii) When combines with moisture present in atmosphere, it also causes acid rain.

$$2NO_2 + H_2O \rightarrow HNO_3 + HNO_2$$

Hydrocarbons :-

These are chemical compounds of carbon and hydrogen only. Methen is the main hydrocarbon present in the atmosphere.

Main sources are :- (a)(i) Methan is emitted during anaerobic anaerobic decomposition of organic matter.

$SO_3 + H_2O \rightarrow H_2SO_4$ → acid rain

Therefore the man-made Sources of SO_2 are :- (a) Coal Combustion
(b) Combustion of petroleum & its products.
(c) During extraction of Sulphide ores like Pyrite
(d) Many industries Such as paper, petroleum refining, Sulphuric acid etc, release SO_2 into the atmosphere.
(e) effects of oxides of Sulphur.

(i) Heighar Concentration of SO_2 may Cause lung disease and even lung cancer. SO_3 is more haumful then SO_2.

(ii) Oxides of Sulphur in the form of acid effect number of materials.
for ex :- (a) Buildings materials Such as lime stone, marbles, Slate, etc.

$CaCO_3 + H_2SO_4 \rightarrow CaSO_4 + H_2O + CO_2$.

(b) Metals, particularly Iron gets Corroded.

(iii) It also effects plants.

8/03/2

Major Air Pollutants of Troposphoric pollution:-

(i) Carbon monoxide
(ii) Oxides of sulphur
(iii) oxides of nitrogen
(iv) Hydro Carbon
(v) Pon Perticulate or Suspended particles.

1) Carbon monoxide :- Co is the colourless, tasteless and odour less gas it is 96.5% as heavy as air and it is not Appreciably Soluble in water the main Source of CoR, a CoR:- (a) natural Source :- (i) wallcanic eruption (ii) forest fire (iii) mithen (iv) decomposition or degradation of Chlorophill

(b) Man-made source :- (i) Incomplate combustion of fuel Containing Carbon.

(ii) Carbon monoxide is Ejected from waste disposal combustion coal mines and power plants.

(iii) ~~Segreate Smoke~~ etc.

Types of Pollution

(i) Air pollution
(ii) Water pollution
(iii) Land pollution.

(i) Air pollution → Air pollution can be defined as any atmospheric condition in which certain substance are present in such concentration they can produce undesirable effect on man and his environment.
mainly we study air pollution of two lower parts of atmosphere i.e, it up to height of 50 km
Therefore air pollution are of two types :- (i) Troposphere Pollution
(ii) Stratospheric Pollution.

Stratospheric Pollution :- The main pollutant of this pair of gases such as oxides of nitrogen oxides of sulfur, hydrocarbon etc. & particulated matter such as dust smoke mist & Fumes etc.

Stratospheric Pollution :- stratospheric pollution solution is mainly due to depletion of ozone which may effect plants and Human life adversely as UV radiations rich the earth.

Types of Pollutants :—

1) Non- biodegradable pollutants :- These are poisions like mercuric salts, aluminium can, non change fenolic chemical, pestisides etc. which either ~~deg~~ do not degrate or degrade and eco system slowly, this is naturally these substance are harmfull even a long concentration,

II Biodegradable pollutants :- These are domestic waste which can be rapidly decomposed under natural process by microorganism

Ex → (i) Deposited matter ~~gases~~
(ii) gases :- oxides of nitrogen, nitrogen di-oxyde, carbon monooxides.

(iii) Fluorides
(iv) Sulphuric acid, nitric acid radio active waste notise and heat etc.

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