

ENVIRONMENTAL POLLUTION UNIT :

* AIR POLLUTION :

It can be defined as any atmospheric condition in which certain substances are present in such concentration that they can produce harmful effects to this environment.

* CLASSIFICATION OF AIR POLLUTION SOURCES :

2 categories:

- (a) Natural Sources and
- (b) Man-Made Sources

(a) NATURAL SOURCES :

- | | |
|-----------------------|---------------------------|
| i) Volcanic Activity | iv) Wind Blown dust |
| ii) Forest Fire | v) Unaerobic Cultivation |
| iii) Ocean Activities | vi) Excessive Cultivation |

(b) MAN-MADE SOURCES :

- | | |
|---------------------------|------------------------|
| i) Domestic sources | iv) Industrial sources |
| ii) Commercial sources | v) Combustion sources |
| iii) Agricultural sources | vi) Automobile sources |

* POLLUTANTS: 2 categories :

- (a) Gas Pollutants and
- (b) Particle Pollutants

* GAS SOURCES :

1) usually gases are gaseous in nature & exists at normal temperatures.

→ SO_2 , CO , NO_2 , smog.

It can be divided in 2 categories :

- Primary Gases : CO , CO_2 , SO_2 , NO

- Secondary Gases : NO_2 , SO_3 , HNO_3 , H_2SO_4 , O_3

* PARTICLE POLLUTANTS :

substances which are not gases but may be in solid particle form.

It can be classified on the basis of size and physical state

- Effects of Air Pollution : ex (Lead-PB, Mercury-Hg)

a) Effects on Human Health

* WATER POLLUTION :

It may be defined as the presence of impurities in water in quantities that may cause a health hazard & making it unfit for use.

* SOURCES OF WATER POLLUTION :

(a) Domestic sources sewerage

(b) Industrial Waste and

(c) Other sources.

- iii) Biodegradable organic waste should be used for generation of bio gas.
- iv) Chemical fertilizers should be replaced by biofertilizers.
- v) Mining techniques should be improved to reduce the spread of mine dust.
- vi) Special pits should be used for collecting and disposing waste.
- vii) the waste material like paper, glass, plastic etc. should be recycled.
- viii) Biological pest control methods should be used to reduce the level of pesticides.

* THERMAL POLLUTION :

It is defined as the undesirable changes in the natural environment due to the presence of waste heat in the water or air.

* SOURCES OF THERMAL POLLUTION :

- i) Nuclear Reactors and Power Plants
- ii) Deforestation of the shoreline.
- iii) Natural causes.
- iv) Soil erosion
- v) Industrial Waste

* EFFECTS OF THERMAL POLLUTION :

- i) It reduces the ~~the~~ content of water.
(DO)
dissolved
Oxygen

- i) It changes the characteristic properties of water.
- ii) It influences reproductive cycle, digestion/respiration rate & many enzymatic activities of living organisms.
- iii) It favours the growth of bacteria and pathogens.

CONTROL OF THERMAL POLLUTION: It can be controlled by:

- i) Cooling ponds and towers.
- ii) Using and wasting less electricity.

RADIOACTIVE POLLUTION OR NUCLEAR POLLUTION:

Radioactive substances which are present in nature emits high energy radiations which pollute the environment and causes harmful effects.

SOURCES

- i) Natural
- ii) Man Made

- i) Radioactive substances / elements present in rock, salt & water like Uranium 235, Uranium 238, Radium 224, Thorium 232, and Carbon 14 etc. and Cosmic rays.
- ii) Nuclear Weapons, fuels, Atomic reactors, radioactive isotopes and X-rays.

EFFECTS

- a) Atomic explosion \rightarrow release large no. of radiations to the environment \rightarrow Radioactive particles fall on earth through the ~~big~~ rain drops \rightarrow they cause soil pollution \rightarrow from soil it is transferred into water sources \rightarrow then enter into food chain \rightarrow ultimately harm human beings.
- b) In Medical Treatments use of X Rays detecting skeleton disorder, Cancer therapy etc. also causes problems.
- c) Radioactive radiations can effects even genes & chromosomes and the resulting mutations are transmitted to generations.
- d) It may lead to burn, miscarriages, lungs, cancer of thyroid.
- e) the damage caused ~~to~~ to the human body by radiations depends upon the dose, dose weight & the part of the body exposed.
- f) In high doses, radiations can cause instant death whereas in lower doses, it can impede the functioning of the body or bones.
- g) In human hands and feet can tolerate a much larger dose of radiation as compared to the other parts of human body.
- h) Some cells like embryo, reproductive, bonemarrow cells are readily affected by radiation whereas the muscles, bones and nervous tissue are less injury prone by radiations.
- i) radiations from strontium 90 gets deposited in bones

as calcium and cause bone cancer.

* CONTROL OF RADIOACTIVE POLLUTION:

- i) The total exposure should be kept below the max. dose.
- ii) Avoid routine X Rays.
- iii) Using Air Filters, exhaust system, wearing protective clothing, minimises the radiation contamination.
- iv) Leakage of Radioactive Elements from Nuclear Reactors need to be checked from time to time
- v) Areas which cause exposure to radiation should be marked as radiation zone and entry should be restricted in those areas.

The Radioactive waste should be stored in the deeper layers of lithosphere where there gradual harmless decay can take place.

Radioactive waste disposal in deep mines, wells, oceans require careful evaluation before being permitted.