

Soil Pollution or Land Pollution

Industrial wastes are effluents discharged from chemical industries, paper mills, tanneries, textile mills, steel industries, distilleries, refineries fertilizers and pesticides industries, food processing industries, cement industries, mining industries, nuclear power plant. Huge quantities of the wastes are dumped on soils, thus contaminating them. Soil also received excreta of animals and humans. Sewage sludge contains many pathogenic organisms, bacteria, viruses and worms which cause land pollutions.

CAUSES OF LAND POLLUTION

(1) Land pollution by industrial wastes –Industrial effluents are mainly discharged from pulp and paper mills, chemical industries, oil refineries, pesticides industries, coal mining, metal processing industries, drugs, glass, & cement industries etc. It has been estimated that about 50% of raw material ultimately becomes waste product in industry of about 20 of these wastes are extremely deleterious.

(2) LAND POLLUTION BY URBAN WASTES- All urban solid wastes are commonly known as refuse, this refuse contains garbage, rubbish material like plastic, glass, metallic cans, fibers, paper, street sweeping, fuel residues, leaves detergents, and other discarded, manufacturing products. In India alone 250 million urban populations produce nearly 25 million tones of solid wastes causing chronic land pollution. Mumbai, Kolkata, Kanpur, and Madras about 8000 tones of wastes material collect in a day. Delhi which is most polluted city, collect 9000 tonnes of garbage from its street per day.

(3) RADIOACTIVE POLLUTANTS- Radio active substances resulting from explosion or radio of nuclear devices, atmosphere fall out from nuclear dust and radioactive wastes penetrate the soil and accumulate there and make pollution. Hydrogen weapons produce C_{14} . This C_{14} participate in the carbon metabolisms of plants which is then introduced into animals and man. Nuclear wastes from nuclear reactor containing Sr_{90} , cesium₁₃₇ goes in soil by rain water and make it polluted by radiation. Recently it has been indicated that some plants such as lichen and mushroom can accumulate cesium₁₃₇ and other radio nuclides which concentrate in grazing animals.

(4) AGRICULTURAL PRACTICES- Huge quantity of fertilizers, pesticides, herbicides and soil conditioning agents are employed to increase the crop yield. U.S.A alone produces about 18 million tones of agricultural wastes every day.

(5) CHEMICAL AND METALLIC POLLUTANTS- A number of industries includes pesticides, paints, dyes soap, detergents, drugs, petroleum, paper, pulp, electro plating and metal industries pour their hazardous effluents in soil and water. Trace elements such as Fe, Co, Ni, Cu, Zn, Ba, Pb, V, Mn, As, Hg, Mo and Silicon are being added to the soil and make them polluted.

(6) BIOLOGICAL AGENTS- Human and animal excreta which causes major source of land pollution by biological agents. The pathogenic agents that polluted the soil may be classified into three categories as follows.

- (1) Pathogenic organisms occurring naturally in contaminated soil such as bacteria, fungi, algae, protozoans and some harmful arthropods.
- (2) Pathogenic organisms excreted by man & animals.

- (3) Medical wastes are also causes land pollution discarded blood sample, cotton, bandages, discarded body part, medicine etc.

EFFECTS OF SOIL POLLUTION

- (1) **INDUSTRIAL POLLUTANTS**-Industrial effects when discharged through sewage will poison the biological purification mechanism of sewage treatment causing several soil and water born diseases. For example some trades wastes contain pathogenic bacteria eg-Anthrax bacilli s present in tannery wastes. The discharge effect soil fertility by changing in physical, chemical and biological properties.
- (2) **URBAN WASTE PRODUCTS**-Sewage sludges has many types of pathogenic bacteria, virus .protozoans which many cause various diseases. Decomposing organic matter is soil also produces toxie vapours aand incease the temperature of that area doe to more CO_2 .
- (3) **RADIO ACTIVE PRODUCT**-Radioactive fallout on retardation is the source of radio-isotopes which enter the food chain in grazing animals and make them polluted.
- (4) **AGRICULTURAL PRODUCT**-Nitrogen and phosphorus from now agriculture technology goes in soil and finally reaches in ground water bodies and slow biodegradable deposits in soil and stop the decomposition of organic matters.
- (5) **MEDICAL WASTE**- Causes pathogeneses and infections.

CONTROL OF SOIL POLLUTION-

- (1) Effluents should be properly treated before discharging them on soil.
- (2) Solid wastes should be properly collected and disposed off by appropriated method.
- (3) From the wastes recovery of useful product should be done.
- (4) Biodegradable organic matter should be used for generation of biogas.
- (5) Cattle dung, Human faeces(night soil) can also be used in the biogas plant to produce methane gas as inflammable gas.
- (6) Microbal degradation of biodegradable substances is also done by scientific approdiate for reducing soil pollution.