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Strategies for Sustainable Development in Soil Pollution

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ABSTRACT
The ground below our feet is much more than rocks, soil and slit. Every square metre can be unique in terms of its composition, its structure and that life that it contains and supports. Some contain more rocks rich in certain minerals: others are rich in plant, residues with air and water. Soil is often a neglected domain of biodiversity but even a small patch can teem with life, hanging from tiny organisms to fungi and earthworms, all playing a vital of role in the functioning of the soil ecosystem. This chapter is given focusing on the following and closely related issues like, causes of soil contamination, health impacts of soil contamination, environmental impacts of soil contamination and methods of cleaning upcontaminated soil.
KEYWORDS: *Fertilizers, Pesticides, groundwater, health effect, environmental effects, heavy metals.*

I. Introduction

"Contamination of soil with Sewage sludge, industrial sludge solid wastes, dump site leachates, agrochemicals and radioactive substances is called soil pollution."

Soil pollution as a part of land degradation is caused by the presence of xenobiotic chemicals or other alteration in the natural soil environment. It is typically caused by industrial activity, agricultural chemicals or improper disposal of waste. The process of soil formation also called pedogenosis. All soils contain organic matter called 'Humus', although the amount and type of such matter may vary considerably. Most living things in soil such as plants, insects, bacteria etc. need humus for energy and nutrition.Plants, fungi, bacteria, animals and even humans affect the processof soil formation. Typically feeding activities of burrowing animals and micro-organisms mix soils and create pores in the soil that allow moisture and gases to seep into deeper layer. Micro-organism such fungi and bacteria also affect chemical changes that occur between plant roots and soil, they also act as a reserve of nutrients.

Types of Soil Pollution

Soil Pollution may be any chemicals or contaminants that harm living organisms. Pollutants decrease soil quality and also disturb the soil's natural composition and also lead to erosion of soil. Types of soil pollution are mainly two kinds -

(1) Biodegradable Pollution - These include simple wastes, which are easily degraded into harmless constituents. Domestic wastes, organic matter of plant and animal origin, blood, urine etc. are placed in this group.

(2) Chemical pollution - These include wastes which are resistant to degradation by biological agencies. They are degraded very slowly due to which they persist in the environment for long duration. Synthetic chemicals, plastics, petroleum crudes, synthetic chemicals, various polymers, pesticides etc. are placed in this group

Sources of Soil Pollution

(1) Agricultural Wastes

- Agricultural processes contribute to soil pollution.
- Pesticides also harm plants and animals by contaminating thesoil.
- These chemicals get deep inside the soil and poison the ground water system.
- Fertilizers increase crop yield and also cause pollution thatimpacts soil quality.

(2) Industrial Waste

- About 90% of oil pollution is caused by industrial waste products.
- These pollutants affect plant and animal species and local water supplies and drinking water.
- Disposal of waste contaminates the soil with harmful chemicals.
- Toxic fumes from the regulated landfills contain chemicals that can fall back to the earth in the form of acid rain and can damage the soil profile

(3) Urban Activities

- Improper disposal of trash breaks down into the soil and it deposits in a number of chemical and pollutants into the soil.These may again seep into groundwater or wash away in local water system.
- Human activities can lead to soil pollution directly and indirectly.
- Excess waste deposition increases the presence of bacteria in the soil.
- Improper drainage and increase run-off contaminates the nearby landareas or streams.

Damaging effects of Soil Pollution

- Various Chemicals like acids, alkalis, pesticides, insecticides, weedicides,fungicides, heavy metals etc in industrial discharge affect soil fertility by causing changes in physical, chemical and biological properties
- Sewage sludge has many types of pathogenic bacteria, virus and intestinal worms which may cause various types of diseases.Decomposing organic matters in soil also produce toxic vapours.
- Nitrogen and phosphorous from the fertilizers in soil reach nearbywater bodies with agricultural run-off and cause eutrophication.
- Acidifaction can produce elevated levels of soluble. Aluminium and mangnese ions are highly toxic to many crops and plants.
- The non-biodegradable plastic and polythene bags can also interfere with the fertility of soil, thus harmful to plants.
- Radioisotopes which attach with the clay become a source of radiations in the environment.

Controlling Measures of Soil Pollution -

- Cattle dung should be used for methane gas.
- From the wastes, recovery of useful products should be made.
- Use of plastic and poly there should be banned effectively.
- Industrial and Agricultural waste should be properly treated before discharging them on the soil.
- Microbial degradation of biodegradable substances is also one of the scientific approaches for reducing soil pollution
- Solid Wastes should be properly collected and disposed off by appropriate method.
- There should be restriction on the nuclear explosion.
- Organic farming should be promoted.
- The best process to control soil pollution is to use eco-friendly system for farming.

II. Conclusion

Soil is a vital part of the natural environment as most plants require a soil substrate to provide water and nutrients and also influences the distribution of plant species and provides a habitat for a wide range of organisms. To ensure sustainable agricultural production and maintenance of biodiversity soil health has to be properly managed.

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