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Popular Article**Heavy Metal Pollution: A Threat To Human Health****Akanksha and Vikash Kumar****Bhola Paswan Shastri Agricultural College, Purnea, BAU, Sabour***Corresponding author: jjholu17@gmail.com**Received: 28/07/2023**Published: 13/10/2023***Introduction**

Heavy metals normally occur in nature and are essential to life but can become toxic through its accumulation in organisms. Arsenic, cadmium, chromium, copper, nickel, lead and mercury are the most common heavy metals which can pollute the environment. Environmental pollution of heavy metals is increasing day by day and has become a problem of great concern due to the adverse effects it is causing around the world. These inorganic pollutants are being discarded in our waters, soils and into the atmosphere due to its rapid growth in agriculture and metal industries, improper waste disposal, fertilizers and pesticides. Some metals affect biological functions and growth, while other metals accumulate in one or more different organs causing many serious diseases such as cancer.

Sources of heavy metal pollution

Heavy metals are found naturally on the Earth's crust since the Earth's formation. Due to the surprisingly increase of the use of heavy metals, it has resulted in accumulation of metallic substances in both the terrestrial and the aquatic environment. Heavy metal pollution has arisen due to anthropogenic activity which is the prime cause of pollution, primarily due to mining the metal, smelting, foundries, and other industries that are metal-based, leaching of metals from different sources such as landfills, waste dumps, excretion, livestock, chicken manure, runoffs, automobiles and roadworks. Heavy metal use in the agricultural field has been the secondary source of heavy metal pollution, such as the use of pesticides, insecticides, fertilisers, and more. Natural causes is also responsible for heavy metal pollution such as volcanic activity, metal corrosion, metal evaporation from soil and water and sediment re-suspension, soil erosion and geological weathering.

Entry, effects and transport of pollutants into the ecosystem

Pollutants enter into the ecosystem through various ways and finally enter into the hydrosphere, lithosphere and atmosphere. Soil pollution can be both deliberate or not. Deliberate pollution includes wastewater irrigation, pesticides, animal manures, fertilisers, leaded paint, mine ore waste (mine tailing), sewage sludge, spillage of petroleum distillates, coal combustion residues, waste dumpings. Using sewage and wastewater that are usually not treated have caused a lot of heavy metals in our agricultural lands and thus have been absorbed by the crops that tend to be eaten by humans themselves. Non-deliberate pollution may be brought through flooding of seas and rivers which brings sewage and contaminated water to the land and accidents involving vehicles transporting toxic chemicals. These heavy metals ruined the ecosystem through entering the food chain. Heavy metals also affect the biodegradability of organic pollutants, making them less degradable and thus causing double the effect of polluting the environment. Water contamination are major caused by two factors: urbanisation and industrialisation. The metals are transported by the runoffs from villages, towns, cities and industries which accumulate in the sediments of water bodies. Even if traces are transported to water bodies, they might still be very toxic to human beings and other ecosystems. Toxicity of heavy metals depend upon lot of factors such as which metal is present, the nature of the metal, the biological role of the metal and the organism exposed. If one organism is affected, this will affect all the food chain and since humans are usually the last of the food chain, this will affect us more as we would have accumulated more heavy metal as the concentration increases along the food chain. Like water contamination, air pollution has been caused due to urbanisation and industrialisation. Pollutants enter the atmosphere in different forms. They can enter as particles, droplets, or in the gaseous form, or association with particles or droplets. Particles and droplets do not travel long distances and usually fall on the ground after a short distance, though if small in size can travel a longer

distance. Particles in the gaseous state can be transported over long distances due to air masses and causes heavy metal pollution.

The fate of heavy metals in the ecosystem

Since metals are non-biodegradable they remain persistent in the environment for a very long period of time, and cannot be broken down. Heavy metals present in soils and sediments remain present for an extended period until they are move to other compartments. They can also react with other elements in the soil or sediment and form or degrade to become more toxic. In the water sector, most rivers are polluted especially those that pass from near industries and mining areas. These then flow down to the sea where they mostly descend to the bottom. The solubility of the metals depends mostly on the pH of the water. As soon as the streams containing heavy metals flow into the sea, the acid rises, and the solubility of the metals decrease and thus precipitate downwards towards the bed.