

Effects of Water Pollution and Control Measures

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DESCRIPTION

Water is one of the essential renewable resources for the maintenance, food production, economic development and general well-being of all living organisms. Most of its uses are impossible to replace, difficult to clean and expensive to transport, it is truly a unique gift from nature to humanity. Water is also one of the most manageable natural resources as it can be diverted, transported, stored and recycled. All of these properties bring great benefits to humans for water. The country's surface and groundwater resources play an important role in agriculture, hydropower, livestock, industrial activities, forestry, fishing, shipping and recreational activities. Over the last few decades, the demand for freshwater has increased significantly due to rapid population growth and accelerated industrialization. Human health is threatened by most agricultural development activities, especially in relation to fertilizer abuse and unsanitary conditions. Human activity associated with large-scale urbanization, agricultural practices, industrialization, and population growth has resulted in poor water quality in many parts of the world.

EFFECT OF WATER POLLUTION

Effect of water pollution on human health

Chemicals in water that effect human health: Ingesting chemical pollutants such as pesticides, fertilizers, and heavy metals can cause serious health problems if ingested. In 2014, residents in Flint, Michigan, experienced water contamination due to inadequate testing and treatment of their water supply.

Water borne disease: Water-borne infections are caused by recreational or drinking water contaminated with disease-causing microorganisms and pathogens. It should be noted that many aquatic pathogens can also be acquired by consumption of contaminated foods and beverages, contact with animals and their environment, or human-to-human transmission.

Effect of water pollution on plants

Effects of acid deposition: Most of the gas from acids, aerosols,

and other acidic substances released into the atmosphere from industrial or household fossil fuel combustion sources eventually falls to the ground and comes from contaminated soil surfaces. It enters the water area with the outflow of rainwater and causes acidification of water caused by a decrease in pH. Chemicals such as sulfates, nitrates, and chlorides have been reported in many countries to acidify water bodies such as lakes, rivers, and ponds.

Effects of detergent deposition: Eutrophication, Household and industrial detergents are washed away in bodies of water, having serious consequences for plants. Detergents contain a lot of phosphate, which concentrates the phosphate in the water. Upon entering the plant through root or surface absorption, phosphates delay plant growth, root elongation, carbon dioxide fixation, photosynthesis, cation uptake, pollen tube germination and growth, chlorophyll and cell membrane disruption. And various metabolic processes cause protein denaturation and lead to enzyme inhibition.

Effects of agricultural chemicals: Chemicals from fertilizers, pesticides, herbicides, etc. that are over-applied to plants are washed away with rainwater as a spill, then into the soil, and finally into the body of water. Eutrophication by fertilizer chemicals causes eutrophication by enriching nutrients. Ammonia from fertilizer is naturally acidic and acidifies water. Similarly, pesticides, herbicides, and pesticides change the pH of water bodies. The most common effect of these substances is the reduction in photosynthetic rate. Some may uncouple oxidative phosphorylation or inhibit the nitrate reductase enzyme. The uptake and bioaccumulation capacities of these substances are great in macrophytic plants due to their low solubility in water.

Effects of industrial wastes: Effluents from industries contain various organic and inorganic waste products. Fly ash forms a thick floating cover over the water, thereby reducing the penetration of light into deeper layers of water bodies. Fly ash increases the alkalinity of water and causes reduced uptake of essential bases, leading to the death of aquatic plants. Liquid organic effluents change the pH of water, and the specific toxicity effects on aquatic plants which depending on their chemical composition. There may be synergistic, additive, or antagonistic

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interaction between metals with respect to their effects on plants. However, these effects are reduced in hard and buffered freshwater bodies.

Effects of oil spillage: Oil pollution from oil tankers and storage containers prevents water from oxygenating and depletes the oxygen content of bodies of water by reducing light transmission, inhibiting plankton growth and photosynthesis in macrophytes.

CONTROL OF WATER POLLUTION

The Ganga River Action Plan and the National River Action Plan are being implemented to address the challenges of capturing, detouring, and treating urban wastewater.

In most parts of the country, wastewater from domestic water sources is not well treated due to inadequate sanitation. This wastewater, which is heavily contaminated with the organic pollutants, enters the surface and groundwater courses near

human settlements, from which more water is used. A large investment is required to install the treatment system.

For political reasons, irrigation water and electricity are subsidized for agriculture. This leads to wasteful flood irrigation rather than adopting more optimal methods such as sprinklers and drip irrigation. Optimized irrigation, planting patterns, and agricultural practices should be encouraged for the wise use of water.

The Central Pollution Control Board (CPCB) has established a network of monitoring stations for aquatic resources across the country. Water quality monitoring and its management are governed at the state/union territory level in India. The network covers 28 states and 6 Union Territories (CPCB Report, 2013). Water quality monitoring is therefore an imperative prerequisite in order to assess the extent of maintenance and restoration of water bodies.