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Global Pollution of Water and Water Resources

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Abstract: Water is one of the most necessary substances in our daily life. Its pollution seriously affects the environment, living organisms, especially human health. Closing the sources of water pollution and reducing the amount of pollution is one of the most important global issues today.

Keywords: water, water pollution, pesticides, bactericides, plastic, ocean waters, sea waters, water pollution with petroleum products, drinking water pollution, toxic substances.

Water pollutants include detergents, oils, petroleum and its derivatives, fertilizers and pesticides, heavy metals and plastics. Major sources of pollution include large cities, oil production and processing plants, mining, agriculture, and marine transportation. Detergents are surfactants that reach water bodies through untreated sewage. Detergents are harmful substances that negatively affect the surface tension of cell membranes. Detergents contain other water contaminants such as lime, amines, bleaches, foaming agents, dyes, perfumes, bactericides and enzymes.Another type of water pollutant is oil, which does not dissolve in water, so it becomes a dangerous pollutant after being discharged into water bodies. They cause the death of many marine organisms because they form a surface film that prevents the diffusion of O_2.

Plastic biodegrades very slowly. Plastics exposed to high levels of sunlight and erosion produce dioxins and other hazardous substances.

In addition, contamination of drinking water with lead, mercury, cadmium and arsenic from heavy metals has a serious impact on human health. Heavy metals enter water through untreated municipal and industrial wastewater.

Mercury can enter the body by drinking contaminated water, and accumulates in the body, causing serious problems. Mercury poisoning causes intellectual disability, vision and hearing loss, nervous system damage, and kidney damage. One form of mercury contamination is the consumption of mercury-contaminated fish.

Arsenic - usually found in water as arsenate. Poisoning with it can cause various types of cancer, especially skin diseases.

Oil is one of the compounds that seriously damage the environment as a water pollutant. Crude oil or its derivatives (gasoline, lubricants) spilled into seas and rivers seriously damage the activity of living organisms in water.

Radioactive waste. Sources of radioactivity are radioactive fallout and water used in nuclear power plants. It can also result from the exploitation of radioactive minerals and the use of radioisotopes for medical and research purposes.

Waste from electronic devices, batteries, etc. contains heavy metals such as mercury, lead and cadmium. These wastes can directly or indirectly reach surface or underground water bodies.

In the electronic industry, arsenic is used in the production of transistors, lasers and semiconductors. These compounds are used in the glass, textile, paper and mining industries.

If industrial wastewater is not treated, arsenic can reach water bodies. Later, they can affect human health by consuming contaminated seafood or water. Industry also produces gas emissions that cause acid rain and deliver nitrogen and sulfur compounds to water. In the same way, acidification of soils occurs, which brings aluminum to water indirectly by water flow. Intensive agriculture uses many chemicals such as herbicides, insecticides, fungicides and fertilizers. The amount of pesticides used in cotton farming and in some areas during cotton picking is very high. Most of these products or their secondary metabolites are washed into water bodies.

Pig farming is one of the most polluted areas in the livestock region. Pig farms produce a large amount of organic waste, which is constantly washed away from the pigsty. If proper treatment techniques are not used, these wastes contaminate surface and even in some cases underground water.

Shipping is one of the most important sources of pollution in the world's oceans. Solid and liquid wastes are discharged into the sea from large cargo ships, ocean liners and fishing fleets.

In the oceans, there are real islands of garbage collected by ocean currents. These islands are formed by the solid waste generated by shipping and the contributions of coastal cities. On the other hand, ships dump various substances into the sea, especially fuel, lubricants and paint residues.

Atmospheric emissions

Another way in which atmospheric pollutants reach the oceans. Lighter parts of salt and debris are absorbed by the wind and blown into the ocean. Many dust particles carry metal particles that are distributed in this way. The second type of air pollution that affects the marine environment is greenhouse gases, which increase the temperature of the oceans by warming the earth. First, the increase in CO_2 concentration can be seen as a result. Second, it contributes to the acidification of the oceans in the atmosphere. Third, combustion processes (for example, car engines) generate significant amounts of CO_2. This increases the frequency of acid rain.

Mangroves. These ecosystems are highly susceptible to water pollution, especially oil spills. The oil covers the pneumatophores, so the plants die from anoxia (lack of oxygen). Aromatic compounds also damage cell membranes, as a result of which cells stop working.

Acid waters. Acidification of water due to pollution reduces the population of decaying organisms (bacteria and fungi). Therefore, the presence of nutrients affects the death of many aquatic plants.

Phosphate residue. Washing and other pollutants increase the level of phosphates in the water. Phosphate compounds enter the roots and affect the growth of plants.

Animal world. Many pollutants in water directly kill wildlife. Others cause endocrine disruptors that lead to reproductive, growth, and behavioral problems. Bioaccumulation of chlorinated paraffin-type pollutants has been found in Arctic fish, as well as in birds and marine mammals. This shows the negative effects of these types of pollutants in water. Water pollution occurs when harmful substances—often chemicals or microorganisms—contaminate a river, lake, ocean, aquifer, or other body of water, degrading the water's quality and making it toxic to people or the environment. This widespread water pollution problem puts our health at risk. Dangerous water kills more people each year than all other forms of war and violence combined. At the same time, our sources of drinking water are limited: less than 1 percent of the fresh water on Earth is available to us. If no action is taken, the problem will worsen by 2050, when global demand for fresh water is expected to be one-third higher than it is now.

Water is prone to pollution in its own way. Known as the "universal solvent", water can dissolve more substances than any other liquid on earth. In addition, water is very easily contaminated. Toxic substances from farms, cities and factories easily dissolve and mix with them, causing water pollution.

Ocean water pollution. 80 percent of ocean pollution (also called marine pollution) occurs on land—along the coast or far inland. Pollutants such as chemicals, nutrients, and heavy metals are carried from farms, factories, and cities by streams and rivers into our bays and rivers; from there they go out to the sea. Meanwhile, marine debris, especially plastic, is washed away by the wind or through storm drains and sewers. Our seas are also sometimes constantly absorbing oil spills and leaks and carbon pollution from the air. The ocean absorbs a quarter of man-made carbon emissions.

In short: water pollution kills humanity. According to a study published in The Lancet magazine, it caused 1.8 million deaths in 2015. Contaminated water can also make you sick. Every year, unsafe water sickens about 1 billion people. Low-income communities are disproportionately at risk because their homes are often closest to the most polluting industries.

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