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River Basin Pollution, Pollution Causes, Consequences and their Prevention

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Abstract: This scientific article provides extensive information about river and river basin pollution. For many years, the rivers, which are considered as sources of fresh water, have been polluted. This, in turn, has become one of the biggest global problems. Information about the causes and consequences of pollution was also given.

Keywords: Water pollution, chemical elements, river basin, waste, anthropogenic factor, river bed, bacteria, microorganisms.

For at least two thousand years, the quality of river water has been continuously deteriorating, and the use of water for various purposes is severely limited, or the water reaches a level of pollution that can be harmful to humans. This deterioration is associated with socio-economic development in the river basin, but long-range atmospheric transport of pollutants has changed the picture: even remote areas can be indirectly polluted. In the Middle Ages, reports and complaints about waste products, filth and stench, and other similar problems in rivers flowing through densely populated cities were the first manifestations of urban water pollution.

Since the middle of the twentieth century and with the acceleration of industrial growth, the various problems of river water pollution have gradually changed. Currently, there are few, almost no rivers in the world that are not polluted by human waste. Fertilizers and pesticides are discharged from agricultural land into rivers with sewage. They also take water from sewers and drainage ditches. Some factories discharge wastewater into rivers and lakes. On our planet, pollution of rivers and lakes with nitrate fertilizers is increasing almost every week. Unfortunately, the situation will become even worse if the use of nitrate fertilizers is banned tomorrow. Nitrates slowly, over many years, pass through the ground into the channels of rivers or lakes. Dirty sewage and fertilizers end up in lakes and reservoirs, causing rapid growth of silt-algae that suffocates river fauna and flora.

Summarizing the situation, we can say the following:

past problems (pathogens, oxygen balance, eutrophication, heavy metals) are recognized, investigated, necessary preventive measures are identified and more or less applied;

today's problems are of a different nature - on the one hand, traditional point and wider sources of pollution (nitrates) and ubiquitous pollution problems (synthetic organics), and on the other, "third generation" problems related to global cycles (acid rain) , climate change).

industries. Unfortunately, developing countries are far behind in controlling their major sources of pollution. As one of the consequences of this, the environment in developing countries is constantly

deteriorating. For at least two thousand years, the quality of water has been continuously deteriorating, and the use of water for various purposes has been severely limited or the water has reached a level of contamination that may be harmful to humans. This deterioration is associated with socio-economic development in the river basin, but long-range atmospheric transport of pollutants has changed the picture: even remote areas can be indirectly polluted. In the Middle Ages, reports and complaints about waste products, filth and stench, and other similar problems in rivers flowing through densely populated cities were the first manifestations of urban water pollution. Microorganisms are common in freshwater bodies, especially those contaminated with untreated domestic sewage. These microorganisms include pathogenic bacteria, viruses, helminths, protozoa and several other complex multicellular organisms that can cause gastrointestinal disorders. Other organisms are more opportunistic in nature, infecting susceptible individuals through contact with water or inhalation of contaminated water droplets from aerosols of various origins. Organic matter is natural (allochthonous terrestrial detritus or autochthonous remains of aquatic plants) or anthropogenic (domestic, agricultural and some industrial wastes) decomposed by aerobic microorganisms in the river bed. As a result, the oxygen level in the downstream of the wastewater decreases, which worsens the water quality and aquatic biota, especially the life of high- quality fish.

Suspended particles are one of the main components of organic and inorganic pollution. Most toxic heavy metals, organic pollutants, pathogens, and nutrients such as phosphorus are contained in particulate matter. Particles are produced by natural causes related to urbanization and road construction, deforestation, mining and quarrying, dredging of rivers, continental erosion or natural disasters. Salinity of river waters is caused by natural conditions, such as geochemical interaction of water with saline soils, or by anthropogenic activities, including agriculture with irrigation, excessive groundwater in islands and coastal zones. may occur as a result of seawater intrusion, industrial waste, and removal of salt solutions. oil fishing, road de-icing, liming with alkaline solutions and sewage runoff. Heavy metals—lead, cadmium, and mercury—are micropollutants that play a special role in human health and the environment with their persistence, high toxicity, and bio accumulative properties. Due to the ever-evolving, aggressive and multifaceted pollution scenario, the problem of water quality has become acute, especially in the urbanized areas of developing countries. Two factors prevent water quality from being maintained at the desired level: the failure of attempts to introduce coercive measures to combat the main sources of pollution, especially industrial sources, and the failure of sanitary-hygienic systems, treatment and waste disposal to meet modern standards. Diseases resulting from ingestion of pathogens from contaminated water have a major impact on health worldwide. Because 80 percent of all illnesses and more than a third of deaths in developing countries are caused by drinking contaminated water, on average, at least one-tenth of a person's productive time is related to water. It is estimated that it will be devoted to diseases. Waterborne diseases constitute the largest category of diseases and are the leading cause of infant mortality in developing countries. This category is the second leading cause of death in adults (one million deaths per year) after tuberculosis. Health problems related to chemicals dissolved in water directly arises from the properties of these substances and has a negative effect in long-term exposure; special attention should be paid to pollutants with cumulative toxic properties - heavy metals and some organic micro-pollutants, carcinogens and substances that can have negative effects on reproduction and development. Other water-soluble substances are important components of the diet and are nevertheless neutral in relation to human needs. Environmental pollution has many effects on freshwater quality and has long-term consequences.

Major causes of local, national, and global water quality degradation include industrialization, the emergence of intensive agricultural technologies, exponential population growth, and the production and use of tens of thousands of synthetic chemicals. The main problem of water pollution is related to the actual or planned use of water. The economic consequences of water

pollution can be very serious due to harmful effects on human health or the environment. Deterioration of health often reduces the efficiency of human labor, and environmental degradation reduces the productivity of water resources directly used by people. Nowadays, the rational use of water resources is an extremely urgent problem. This is, first of all, the protection of water bodies from pollution, and since industrial wastewater occupies the first place in terms of volume and damage, it is necessary to solve the problem of their discharge into rivers first. In particular, it is necessary to limit discharge into water bodies, as well as to improve production, treatment and disposal technologies. Another important aspect is the collection of fees for the discharge of waste water and pollutants, and the transfer of collected funds to the development of new waste-free technologies and treatment facilities. It is necessary to reduce the amount of payment for environmental pollution to enterprises with minimum emissions and emissions, which will serve as a priority to maintain or reduce emissions to a minimum in the future.

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