

WATER BASIN PROBLEMS AND SOLUTIONS OF PRESENT TIME ECOLOGY

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Abstract. This article presents an analysis of the results of microbiological and sanitary-chemical examinations of the pollution status of open water bodies over the years, as well as a scientific justification of preventive measures aimed at reducing pollution.

Keywords: population, global, water bodies, pollution, hygienic requirements, microbiological indicators, ecology,

Relevance. Today, sustainable management of water resources and ensuring their effective use have become one of the key issues for the sustainable economic development of all regions and countries in the world. This issue is extremely relevant and gaining even greater importance in the context of new economic, social, political and environmental realities in the Central Asian region, where water resources are limited, the economy and population are growing rapidly, and the effects of climate change are increasingly felt. Increasing the efficiency of using limited water resources while ensuring the stability of both economic and environmental requirements is an urgent problem of the time. Achieving integrated water resources management is of great importance in implementing the development agenda for sustainable development adopted by the UN and designed for the period up to 2030. The rapid development of the scientific and technological revolution is complicating the relationship between society and nature, between man and the environment, and is causing unexpected changes in the management of ecological processes in the biosphere. Often, these changes in relations

lead to the rapid pollution of water, atmosphere, soil and other natural elements with various wastes and to the further increase of environmental problems. Despite the abundance of water resources, water is polluted by household and industrial wastes, wastewater from agricultural lands, and wastewater from livestock farms. Wastewater from industry and agriculture contains various minerals, heavy and toxic metals, pesticides, petroleum products, waste from oils and paints, wood and other objects. Every year, 1,603 kilometers of industrial wastewater are discharged into rivers, more than 500 million tons of mineral fertilizers and about 3 million tons of toxic chemicals are applied to arable land. They are washed away by surface wastewater and fall into water bodies, polluting them. The amount of water suitable for irrigation and drinking has decreased. The Resolution of the Cabinet of Ministers of the Republic of Uzbekistan "On further improving the system for assessing the level of environmental pollution" stipulates that continuous monitoring of microbiological and sanitary-chemical indicators of water in water bodies in places where the population uses water is carried out. This resolution provides for improving mechanisms for assessing the level of environmental pollution, monitoring the environment, predicting its level of pollution, providing state environmental control with constant information, and monitoring the state of polluting sources and their impact on the environment.

The world community has been facing the impact of numerous disasters in recent years that have caused great damage to the economy, sustainable development, human well-being and the environment. In order to solve these problems, the UN World Water Report states that: Water-related hazards and disasters, such as floods and droughts, which are increasingly occurring due to climate change and the increasing variability of water resources, are causing even greater losses to humanity and the economy. Nowadays, it is also important to promote the rational use and protection of water resources. Promoting the protection of water resources also ensures the rational use and environmental and legal protection of other natural objects. Environmental and legal protection of water resources and promoting their rational use require environmental and legal protection not only of water and water objects, but also of other natural resources.

Based on the above, we set a goal to monitor the pollution status of open water bodies in residential areas over the years and hygienically assess the results obtained. The results of laboratory analysis of the pollution status of water bodies established the following: in 2020, the number of facilities discharging wastewater into category 1 water bodies was 11, of which 6 were domestic wastewater, and 5 were industrial wastewater. During the monitoring year, the total number of samples for microbiological indicators was 90, of which 8 (8.8%) were taken, and 185 samples for sanitary-chemical indicators, of which 7 (3.78%) did not meet hygienic standards (Fig. 1).

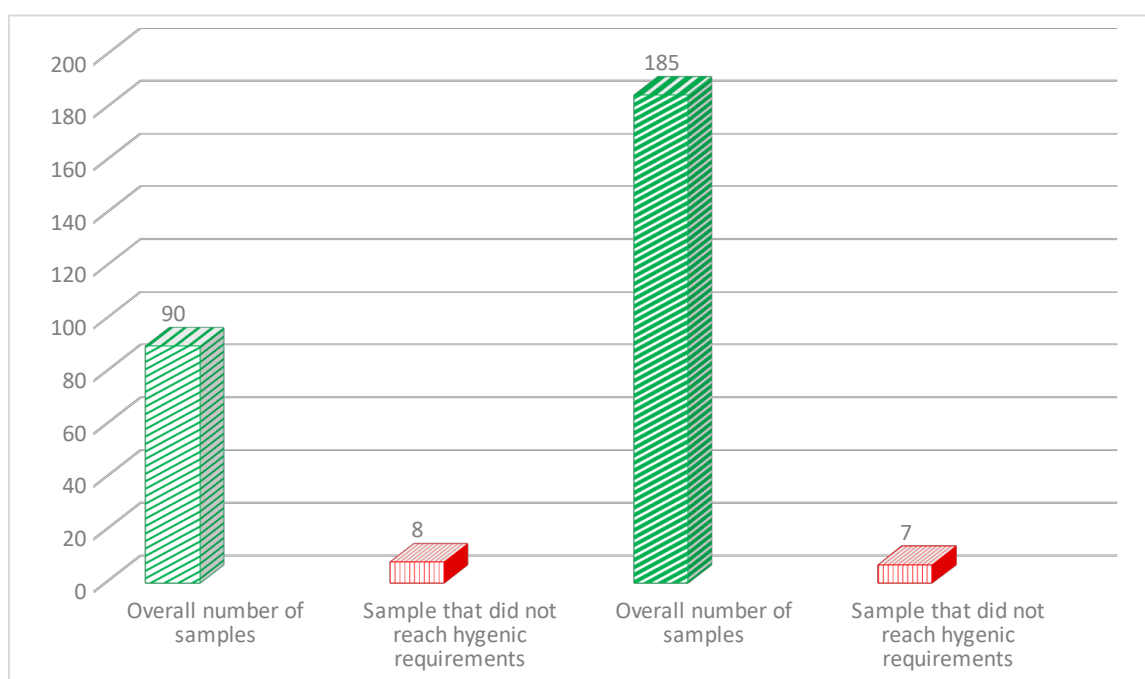


Figure 1. Results of microbiological and sanitary-chemical inspections of category 1 water bodies in 2020.

In the same year, the number of facilities discharging wastewater into 2nd category water bodies was 18, of which 12 were household wastewater, and 6 were industrial wastewater. In the observation year, the total number of samples for microbiological indicators was 133, of which 20 (15.03%) were taken, and for sanitary chemical indicators, 69 samples were taken, of which 13 (18.8%) did not correspond to hygienic standards (Figure 2).

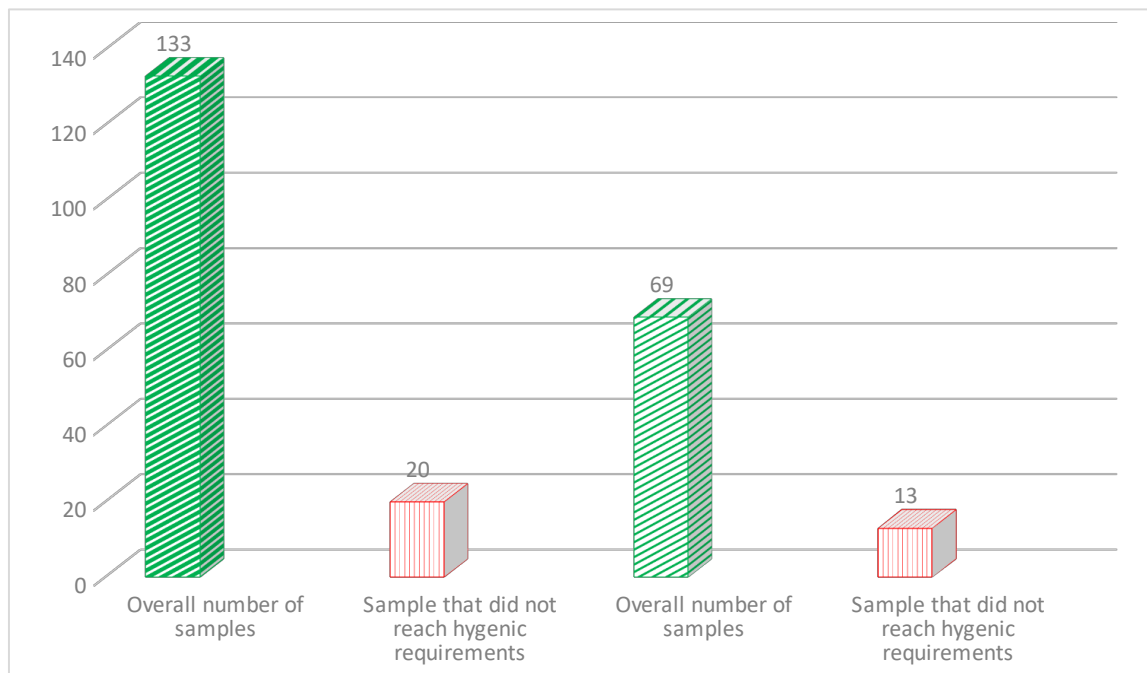


Fig. 2. Results of microbiological and sanitary-chemical examination of category 2 water bodies in 2020

In 2021, there will be 10 facilities discharging wastewater into Class 1 water bodies, 6 of which are household wastewater and 4 are industrial wastewater. In the monitoring year, the total number of samples for microbiological indicators was 719, of which 12 (1.6%) were taken, and for sanitary chemical indicators, 407 samples were taken, of which 24 (5.8%) did not correspond to hygienic standards. In the same year, the number of facilities discharging wastewater into 2nd category water bodies was 27, of which 18 were household wastewater and 9 were industrial wastewater. In the observation year, the total number of samples for microbiological indicators was 2045, of which 44 (2.15%), and for sanitary chemical indicators, 535 samples were taken, of which 73 (13.6%) did not correspond to hygienic standards.

In 2022, the number of facilities discharging wastewater into 1st-class water bodies will be 7, of which 5 are household wastewater and 1 is industrial wastewater. In the observation year, the total number of samples for microbiological indicators was 409, of

which 16 (3.9%) were taken, and for sanitary chemical indicators, 326 samples were taken, of which 8 (2.4%) did not correspond to hygienic standards. In the same year, the number of objects discharging wastewater into the 2nd category water bodies was 21, of which 10 were household wastewater, and 11 were industrial wastewater. In the observation year, the total number of samples for microbiological indicators was 1881, of which 307 (16.3%), and 743 samples for sanitary chemical indicators were taken, of which 125 (16.8%) did not correspond to hygienic standards.

Conclusion: From the results obtained, it can be concluded that, according to the results of microbiological and sanitary-chemical analysis of water in water bodies, some samples did not meet hygienic requirements. The analysis of samples that did not meet hygienic requirements shows that in water bodies of category 1 in 2020, the largest number of samples (8.8%) did not meet hygienic requirements in terms of microbiological indicators, and in 2021 - in terms of sanitary-chemical indicators (5.8%). In the analysis of water bodies of category 2 of the samples that did not meet hygienic requirements, the largest number of samples (18.8%) did not meet hygienic requirements in terms of sanitary-chemical indicators in 2020, and in 2022 - in terms of microbiological indicators (16.3%). This serves as the basis for developing preventive measures for the sanitary protection of water bodies from pollution.

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