

Natural environment assessment of negative impact of anthropogenic factors

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Abstract. Sustainable development of each region of the country and improvement in living standards and public health can only be achieved by preserving natural capital and maintaining proper environmental quality. Environmental quality in the Krasnodar Region is determined by levels of anthropogenic and technogenic load on the natural environment. Sources of pressure are objects of industry, power engineering, transport, capital construction, agroindustrial complex and municipal services, which lead to pollution of atmospheric air, water and land resources, to pollution of surface and ground water and degradation of some water bodies, to disruption of ecosystems of flora and fauna. The article is devoted to the review of the condition of atmospheric air and water bodies in Krasnodar Krai, as well as to the study of pollution indicators of discharged wastewater in the territory of the region. Information on indicators of polluted wastewater discharge into water bodies is presented, a grouped table is determined on the basis of these pollution indicators, which indicates the main reasons for the continued pollution of surface water bodies, conclusions are drawn as to what measures to solve the global environmental problem should be taken to improve the quality of wastewater treatment.

1 Introduction

Environmental conditions are characterised by significant environmental problems. Environmental issues are now being dealt with all over the world. Control over the observance of environmental protection legislation by all economic activities has recently been strengthened [1-3].

The objectives of state policy in the field of environmental security are to preserve and restore the natural environment [4], to ensure the quality of the environment necessary for a favourable human life and sustainable economic development, and to eliminate the accumulated environmental damage resulting from economic and other activities under conditions of increasing economic activity and global climate change [5-7].

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Environmental legislation is constantly changing in connection with real transformations in industry, agriculture and other spheres of activity [8-9]. In the information space, natural resource users, environmentalists, industrialists, lawyers, economists, the public and other citizens widely discuss current trends in this area and propose systemically sound solutions [10-11].

2 Methods and materials

Considering the system of atmospheric air quality management in Krasnodar Krai, the following structure is defined:

- monitoring of atmospheric air quality;
- setting standards for emissions of harmful substances into the atmospheric air by stationary and mobile sources on the basis of the calculation of the concentration of harmful substances, contained in the emissions, in the surface layer of the atmosphere;
- control over compliance with the established emission standards;
- development and implementation of action plans aimed at reducing emissions of pollutants into the atmosphere.

The atmospheric air monitoring system is based on a network of routine observation points, which are installed in cities both in areas with increased anthropogenic impact and in relatively uncontaminated areas.

The rational use of natural water resources in the economic system is an important element determining the social, environmental and economic development of any region.

A thorough treatment of wastewater can also reduce the negative impact on the environment. The methods of treatment depend largely on the type of wastewater, its pollution and the characteristics of the water body in which it is planned to be discharged.

Each region has its own standards for permissible concentrations of pollutants in wastewater. Based on this, permissible discharges are established for each of the enterprises operating in the area (based on the report on the state of nature use and environmental protection in Krasnodar Krai).

The structure of discharged wastewater in the Krasnodar Krai in 2021 is shown in Figure 1.

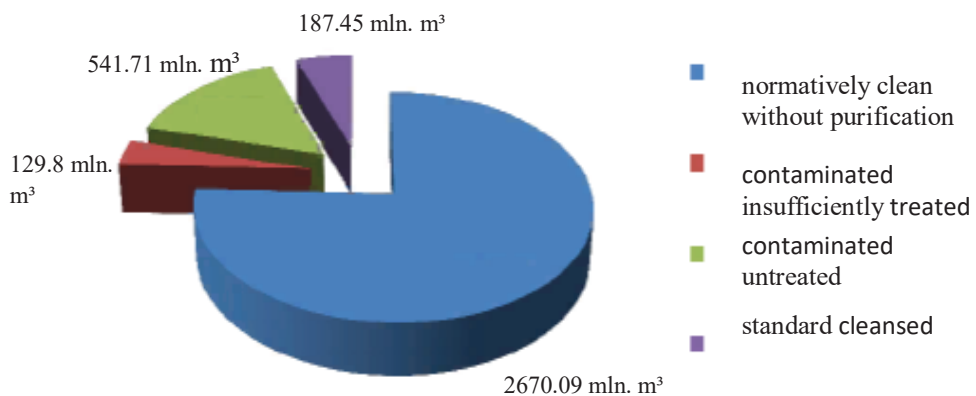


Fig. 1. Structure of discharged wastewater in Krasnodar Krai.

Based on the permissible discharges, standards are developed for enterprises which discharge into natural water bodies.

The results of the analysis of polluted wastewater discharges into water bodies of the Krasnodar Krai in 2017-2021 are shown in Figure 2.

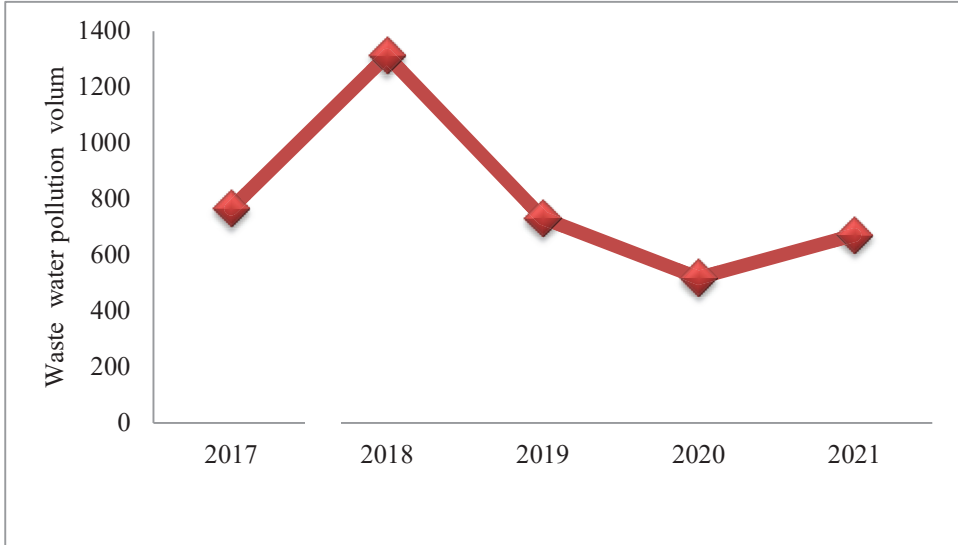


Fig. 2. Dynamics of polluted wastewater discharges into water bodies in the Krasnodar region in 2017 – 2021.

Figure 3 shows the main reasons for the continued pollution of surface water bodies.

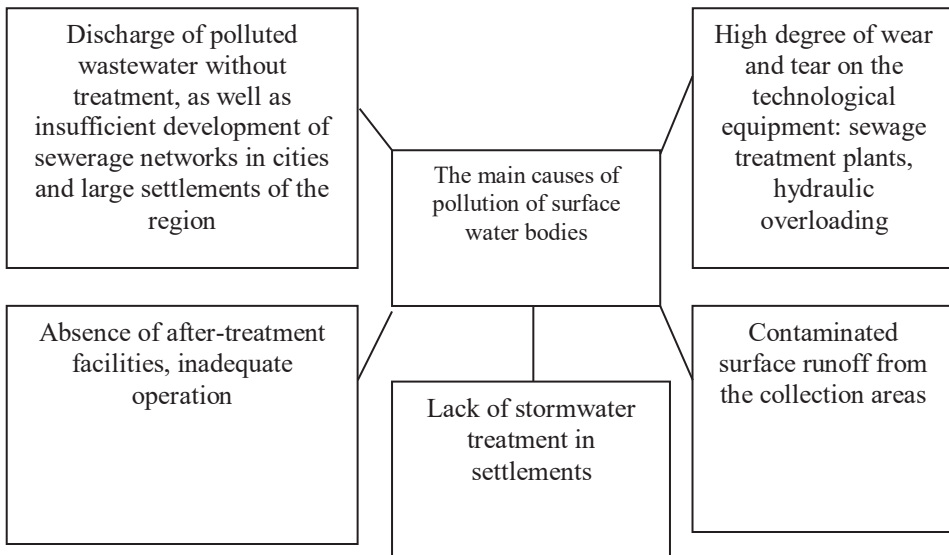


Fig. 3. Main causes of surface water bodies' pollution.

3 Results

As one of the global environmental problems is the improvement of surface water quality in the Krasnodar Krai, based on the given data on the overall assessment of the environmental situation, measures and methods to solve wastewater treatment to a satisfactory condition should be applied (Figure 4).

In addition, supervision and requirements for the discharge of untreated domestic and industrial wastewater into water bodies that are sources of drinking water supply and recreational water use areas need to be strengthened.

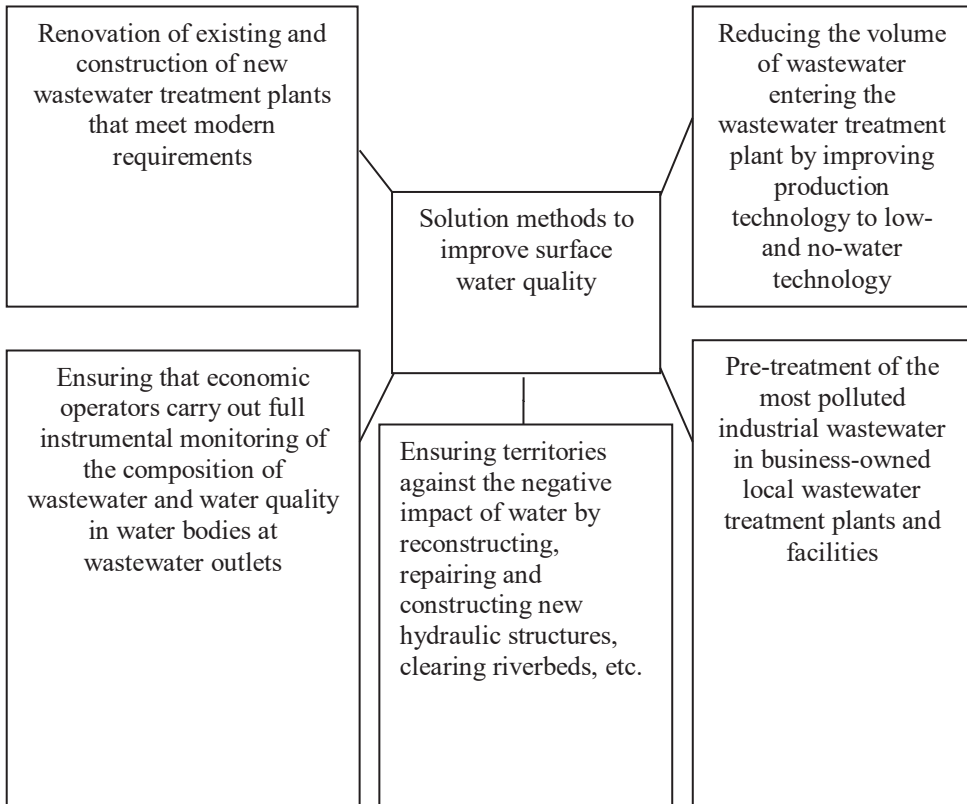


Fig. 4. Solutions to improve surface water quality.

4 Discussion

The condition of water resources is known to depend on the overall condition of the natural environment. Taking into account that the Krasnodar Region is a major resort region, its further development as a resort region as a whole depends on the quality of its surface water bodies.

5 Conclusions

Natural world is greatly affected by all the activities of humanity. Many factors in construction affect the entire ecosystem, all the resources that we have. Unfortunately, man, cannot refuse to use the resources without causing harm to his vital needs.

But through many restrictions and regulations to ensure minimal harm to the environment, the environmental hazards of severe pollution can be reduced.

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