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Substantive Of Socio-Ecological Instruments To Water Management Into South Of Russia.

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ABSTRACT

The article explores some tools for water resources management at the meso level, including geographic, economic-social and hydrological. Some directions and measures for minimizing damage to the water area of the South of Russia are given. The water-resource potential of the South of Russia is analyzed, the instruments and directions of strategic management of the water management complex of the South of Russia are presented.

Keywords: water resources, water management complex, surface water quality, rational nature management.

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INTRODUCTION

The water management complex as a whole and its water area largely determine the socio-economic stability and direction of the development of the region. The level of the provision of quality drinking water, ecological and water security, the permanence and adequacy of water supply to the economic sectors of the region, the state and isostasy (hydrostatically equilibrium of the earth's crust) of water bodies, the correctness and accuracy of forecasting emergencies in this area, the timely measures to prevent or minimize damage to a large extent depends on the environmental situation in region.

The purpose of the study: the study of water management tools in the South of Russia, the rationale for directions and measures to minimize damage to the water area of the South of Russia.

MATERIALS AND METHODS

The study was carried out on the basis of information obtained from statistical data and studies conducted by the Federal Service for Hydrometeorology and Environmental Monitoring. During the research, various methods of cognition, interpretation, systematization, and generalization of information were used.

RESULTS AND DISCUSSION

The South of Russia is one of the most densely populated regions of Russia: 23.4 million people live in a relatively small territory (about 3.4% of the total territory of Russia), which is more than 16% of the total population of the country. The territory includes two large administrative-territorial units - the Southern and North-Caucasian federal districts. The density of the population of the region meets European standards. Accordingly, the immanent (inalienable, owned) consumption of natural, including water resources, is directly dependent not only on the level of socio-economic development of the region but also on activities aimed at maintaining and protecting the existing national heritage of the region. Against this background, along with financial, economic and social problems, the problem of preventing a large-scale ecological catastrophe can arise.

The International Water Association and UNESCO in 1993 initiated the establishment of World Water Day, which was established on 22 March by the decision of the UN General Assembly. This day gives an opportunity to regularly remind of the immense importance of water resources for the environment and the development of society in the south of Russia.

In the South of Russia, there is a sufficient water-resource potential. In terms of water resources, the region takes a leading place in the Russian Federation.

To date, the existing water management complex copes quite effectively with the provision of social, economic and sectoral needs in water resources. However, the course taken on the innovative cluster development of the region within the framework of the import substitution program, in particular in the Rostov region, will require the growth of the guaranteed volume of use of the water fund intended for satisfying drinking and domestic needs, as well as for use in industry, agriculture, energy and recreational purposes.

The state pays close attention to the rationalization and efficiency of water use and use. The present system of water fund management is regulated by the Water Code of the Russian Federation adopted by the State Duma on April 12, 2006. Control and regulation of the use of all water resources are carried out by the Federal Agency for Water Resources (Rosvodresursy). It is a federal executive body that performs functions to provide public services and manage a federal property in the water sector. Regional Long-term target program "Development of the water management complex of the Rostov region in 2013-2020" and the program "Environmental protection and rational nature management" [3] are operating at the regional level. In addition, the Russian Federal Service for Hydrometeorology and Environmental Monitoring regularly monitors the state of the water management complex in Russia. The yearbook of the state of the ecosystems of the surface waters of Russia on hydrobiological indicators gives the notation characterizing the quality of water, as shown in Figure 1 [4].

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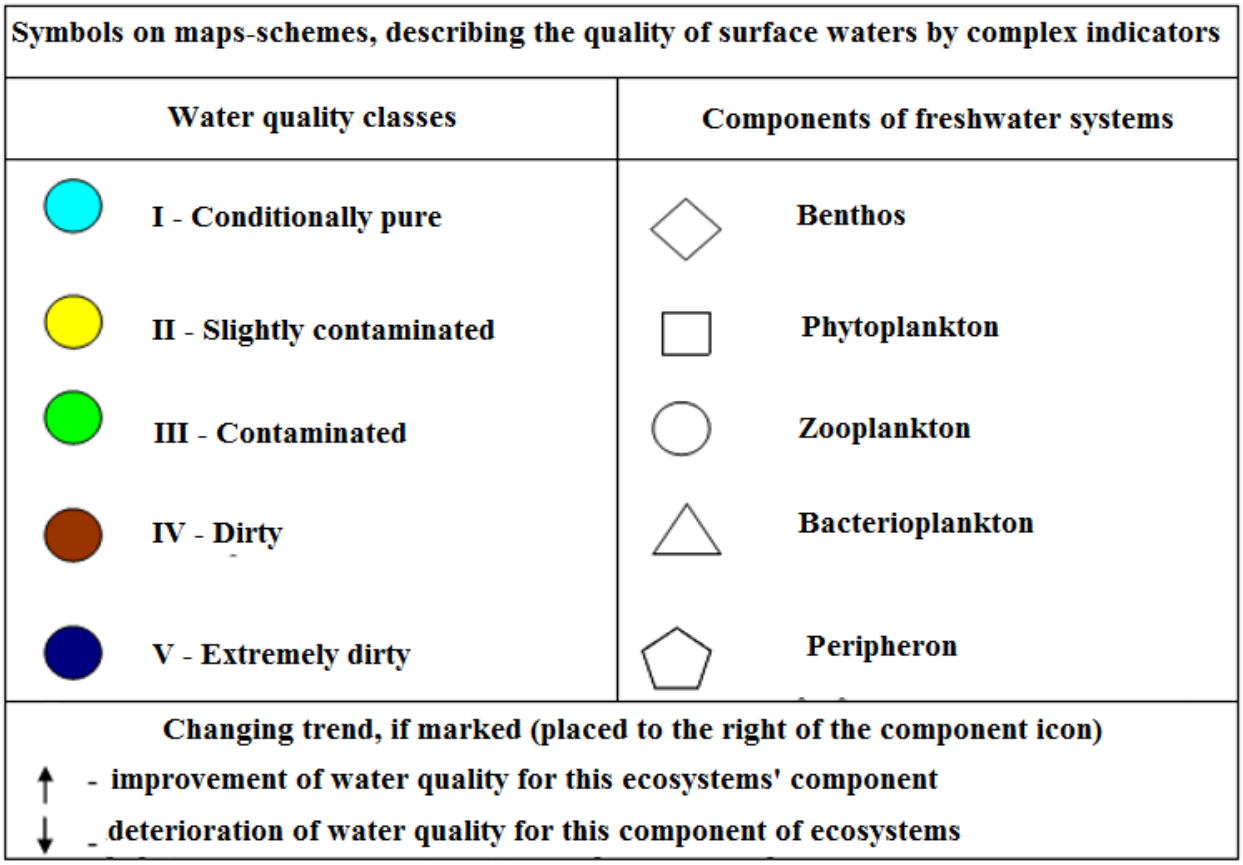

Figure 1: Designations on maps-schemes that characterize the quality of surface waters by complex indicators

Despite the measures taken, hydrobiological monitoring of the water area of the Southern and North Caucasus Federal Districts has shown that the quality of surface waters is estimated to be "moderately polluted".

The research shows that the majority of water bodies in Astrakhan (63.6%) and Rostov (74.6%) regions are characterized by the water of the 4th class ("dirty" and "very dirty"). As in previous years, the majority of water bodies in the Krasnodar Territory (71.8%), the Volgograd Region (94.4%) and the Republic of Adygea (50%) belong to the third class of water quality.

Good water quality (2nd class "slightly polluted") is characterized by water objects in the Krasnodar Territory (23.0%), the Republic of Adygea (50.0%). As "conditionally clean" are estimated 2.6% of water bodies in the Krasnodar Territory.

Obviously, the water quality of the Kabardino-Balkarian Republic is estimated to be of poor quality, with 71.4% being the sites assessed by the class of "dirty" and "polluted" water. Almost all the water resources of the Republic of Dagestan (80%) and half of the Stavropol Territory (50%) are estimated as "contaminated", the rest as "contaminated" (3rd class of quality)

In the Stavropol Territory, there are objects with slightly polluted waters. Weakly polluted water bodies (2nd class) make up 27.8% in the Stavropol Territory, 41.2% in the Republic of North Ossetia-Alania. Part of the water basin in the Republic of North Ossetia-Alania (grade 5 of quality) remains extremely contaminated. The reason for the water-ecological balance can be the growth of the population and the need to meet the growing material needs of people, which results in a growth in the scale of economic activity and entails an increase in the anthropogenic pressure on the aquatic environment. As a result, the problems of large-scale contamination of the ssocio-ecosystem global changes in the climate sector and similar natural disasters are aggravated.

Today, scientists, environmentalists, researchers, economists and politicians raise the problem of ecological destruction both at the world level and at the meso level. In the Southern Federal District, the following major water problems identified in the Strategy of Social and Economic Development of the Southern Federal District for the period until 2020 [8]:

a) the emergence of a shortage of drinking water (especially in the Republic of Kalmykia);
b) the generally low quality of surface water in the district;
c) floods and other negative impacts of water (especially in the Kuban River basin);
d) significant water losses in existing irrigation systems, their degradation;
e) insufficient realization of the potential of irrigated agriculture, fisheries, hydropower, and water communications (with possible navigation less than 10-11 months in the region);
f) reduction of the capacity of small watercourses of the Volga delta and silting of the western-subordinate ilmenia of the Astrakhan region.

With the purpose of early diagnosis of emerging problems, it is necessary to use the indicative model of metrics of human interaction with the environment. G.A. Statusha, I.N. Gigirey and BN The mosquito [7] in their studies distinguish the following indicators of interaction with the environment:

1) Sustainability Index ESI-2005ESI-2005 (2005 Environmental Sustainability Index);
2) Indices of environmental manageability:
- Index of environmental manageability EPI-2006 (EPI-2006 Environmental Performance Index-2006);
- Index of Environmental Indicators-2008 EPI-2008 (EPI-2008 Environmental Performance Index-2008);
- Index of water stress.

With the help of these indicators, the load is assessed for surface and groundwaters, emissions for fresh water, nitrogen load, energy consumption and climate change, the contribution to climate change and a number of other significant indicators.

In the practice of the Rostov region, the interaction between users and the environment is measured at the level of the Ministry of Natural Resources of the Rostov Region in terms of the factor-sectoral feature, Rostovstat [6] calculates the cost of maintaining the socioecoclimate. In his active values of indicators in the following areas:

- emissions of pollutants from stationary sources into the atmosphere without treatment;
- current costs of environmental protection;
- basic indicators of the forest fund;
- especially protected natural areas;
- abstraction of fresh water;
- emissions and trapping of air pollutants;
- emissions of the most common air pollutants.

Table 1 shows the costs of the Russian Federation for maintaining and maintaining the environment at the meso level.

Table 1: Expenditures on environmental protection in the Russian Federation according to the Federal State Statistics Service (million rubles)

Indicators	2015	2016	2017
Cost, total	582128	590865	657024
Including:	93251	112412	102765
Protection of atmospheric air and prevention of climate change	204351	223439	234112
Collection and treatment of waste water	51612	61823	68482
Waste management	33486	36105	37952
Protection and rehabilitation of lands, surface and groundwater	28082	34189	44593
Conservation of biodiversity and protection of natural areas	68602	68343	94224
Other	0,7	0,7	0,7

From the research data in Table 1, it can be seen that the growth of costs is steadily increasing, and this is due not only to inflation processes but also to the need for caring for our environment.

Water resources management is one of the promising areas of change for the better in the water basin of the South of Russia. At the level of the South of Russia, the costs of maintaining the water management complex are presented in Table 2.

Table 2: Current costs of environmental protection (million rubles)

Indicators	According to Rostovstat	According to the North-Caucasus	Total
Current costs for environmental protection - total	5941	2479	8420
including:	3648	1711	5359
for protection and rational use of water resources	321	350	671
on protection of atmospheric air	1590	374	1964
on protection of the environment (land resources) from production and consumption wastes	44	28	72

Regional running costs, as Table 2 also shows, also have significant amounts, which indicates the management of the environmental situation in the region.

Stages of development of strategy and options for water resources management (WRM) are presented in Figure 2.

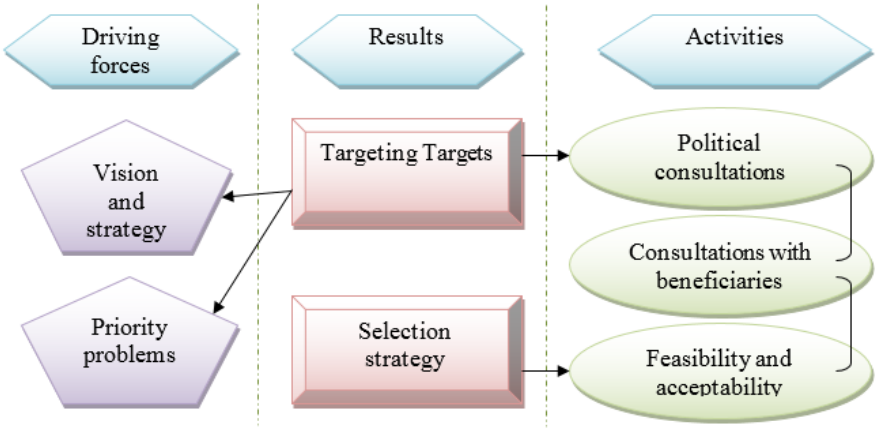

Figure 2: Stages of strategy development and options for WRM [1]

Among the tools for water resources management are the following:
- water resources assessment;
- rational use of groundwater and surface water;
- Demand management;
- management of water pollution;
- regulation of social changes;
- settlement of conflict situations;
- use of administrative instruments of influence;
- use of economic instruments of influence;
- management and exchange of information.

An important direction in the management of water resources and the environment, in general, is the implementation of environmental audit procedures, the problems in this area are almost identical throughout the world. Russia over the past decade has been a party to more than 40 multilateral agreements in the field

of environmental protection and conservation of natural resources [2].

The plan for renewal and development of the state system for monitoring surface water bodies within the framework of the Federal Target Program "Development of the Water Management Complex of the Russian Federation in 2012-2020" until 2020 provides:

- an increase in the number of observation posts on the territory of Russia by 900 units;
- re-equipping with modern equipment and measuring instruments that provide observation and data transfer to forecast centers in real time more than 85% of existing hydrological observation stations;
- re-equipment of all laboratories and regional centers for hydrometeorology and environmental monitoring;
- Development and improvement of methods, models, and technologies of hydrological forecasts (long-term forecasting of water inflow to reservoirs, methods of probability forecasts, etc.).

CONCLUSION

With the right approach to strategic water resources management, the results of solving the water problems of the South of Russia and the development of its water management complex will be:

a) provision of the population with quality drinking water with overcoming current deficits;
b) improving the quality of surface water;
c) protection of the population, residential and economic facilities from floods and other negative impacts of water;
d) restoration and reconstruction of previously mastered irrigation and water supply systems with the introduction of innovative water-saving reclamation technologies;
e) further realization of the potential of water communications, fisheries, irrigated agriculture, and hydropower.

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