

Organizational Aspects of Increasing the Efficiency of Water Resource Use Management (In The Case Of Kashkadarya Region)

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Abstract: The article presents the results of a survey of river basin territories, the nature of runoff formation and the use of water resources. Modeling of the use of water resources in river basins is presented, criteria for qualitative and quantitative water parameters are established.

Keywords: water systems, Kashkadarya region, effective use of water, living conditions, economy, integrated use, industrial drinking, domestic drinking

In the world, special attention is paid to research work on the development of methods for improving the integrated use and effective management of water resources of rivers and reservoirs. At the same time, research work on the development, based on classical methods of hydraulics, an equation of state, an equation for the balance of water flow in a small river, as well as an equation for the movement of water flow by controlled reservoirs, the creation on their basis of hydraulic methods for daily regulation of the operating mode of reservoirs, ensuring reliability and efficiency the use of water resources of small rivers is a priority. The republic is taking measures to establish the patterns of formation of water resources of small rivers, determine the needs of economic sectors and the population for water, to effectively use water resources of reservoirs, to determine the influence of reservoirs on small rivers on the condition and quality of water, to ensure the reliability and safety of reservoir structures and to improve efficiency of using reservoirs for irrigation and energy purposes. Scientific research aimed at analyzing and assessing the conditions for the formation and management of water resources in small river basins and drawing up water and water-salt balances was carried out by V. L. Shultz, V. G. Andreyanova, G. S. Semenova, A. G. Bulavko, I. A. Shiklomanova, F. Kh. Khikmatov, E. I. Chembarisov, etc.

The shortage of water resources, as well as a serious deterioration in their quality, are among the most important problems that individual countries and, especially, the Republic of Uzbekistan face today. Water is an integral part of the economic, ecological and social system of our country, and the critical deterioration of its condition caused by human and technogenic impacts on water systems inevitably entails both natural and socio-economic problems. The most unfavorable zone in terms of water supply in Uzbekistan is the territory of the Kashkadarya region, in particular, its old irrigated zone, for which the main source of water supply is the river. Kashkadarya. It should be noted that the river basin Kashkadarya is an integral part of the transboundary river basin. Amu Darya. For full-scale use of water resources in the river basin. Kashkadarya (Fig.) large reservoirs have been

built: Chimkurgan (500 million m³), Pachkamar (260 million m³), Gissarak (170 million m³) and many reservoirs with volumes from 1 million m³ to 10 million m³, and also hydraulic structures capable of basically controlling the full use of water flow for irrigation needs. Thus, complete regulation of the river flow has been achieved, and two- or three-fold reuse of water for irrigation needs has also been observed. The excessively high level of use of river flow in the Kashkadarya basin has led to the complete degradation of the river ecosystem, and the middle and lower reaches of the riverbed have been turned into collectors for the removal of waste and drainage waters. The river ecosystem and the surrounding area are degraded, which has a negative impact on the living conditions of the population.

Currently, it is absolutely obvious that existing technologies for distributing water over the irrigated area need to be improved; the economy is suffering from the depletion of surface and underground water resources; including as a result of satisfactory management of the irrigation system and its unsatisfactory condition; lack of qualified personnel and specialists on the rational use of water resources in agriculture; lack of economic mechanisms for preserving and protecting water resources and improving their quality; as well as the lack of modern equipment for drinking water supply. To solve these problems, it is necessary to develop and adhere to new approaches to managing the use of water resources and develop a strategy for sustainable agricultural development.

To conserve water resources, Uzbekistan needs to strengthen its legal and institutional mechanisms, develop and implement comprehensive methods for rational management of water and land resources, improve irrigation planning and more actively involve the agro-industrial sector in the rational use and distribution of water for irrigation.

To ensure sustainable development of a region with high environmental tension, it requires a special approach to the implementation of scientific and technological achievements. There is a need to develop reduction methods and improved water management system approaches. There are still important research challenges regarding water management modeling to link it to a river basin or watershed.

For the life of waters and the maintenance of ecological balance in the aquatic environment, it is not processes at the organismal level that are essential, but mass biological phenomena that ultimately determine the water quality of water bodies. That is, its suitability for various types of water use: irrigation, drinking and industrial water supply, recreation, livestock watering, fisheries, as well as the productivity of natural waters, depending on the level of development of the natural food supply of fish. Therefore, of practical importance are, first of all, impacts that in one way or another affect the numbers, biomass, productivity and intensity of vital activity of populations of mass species of hydrobionts and aquatic communities in general.

The study of general patterns of water quality management in aquatic ecosystems, which determines the flows of matter and energy in them, is an extremely important problem both in theoretical and applied aspects. The practical application of the water quality management system for reservoirs and streams will allow assessing the environmental situation and monitoring its dynamics, which is very important at the local level, identifying specific areas with the most tense environmental conditions, outlining a targeted action plan for its stabilization, developing the environmental policy of the Republic and make the necessary decision.

Farms, as a rule, are scattered across the territory of large farms in separate areas, and therefore are considered as secondary water users who do not have direct contact with state and water management systems. Their interests in the latter are represented by the irrigation services of large farms, and they also organize water use.

Currently, the organization of water use on farms solves the following problems:

- drawing up a water use plan;
- operational water use;
- accounting and control of water use;
- supervision and care of the condition of water facilities;
- current and major repairs of water management facilities.

Currently, priority research work is being carried out in various countries to study the forecasting of water-saving technologies for irrigation of agricultural crops using geographic information systems (GIS), assessment and justification of irrigation methods and techniques, and when carrying out a set of reclamation measures for different years of water availability.

More than 85% of Uzbekistan's territory is in arid or semi-arid conditions, including the Kyzylkum desert, the largest desert in Central Asia. Uzbekistan is perhaps the most vulnerable of the Central Asian countries with regard to water resources and irrigated agriculture, because it has the largest irrigated area (4.3 million hectares), a large rural population (more than 18 million) and a high population density of 49.6 people per square kilometer. As an arid country but a major consumer of water obtained from sources beyond its borders, Uzbekistan suffers heavy losses from water shortages. Problems related to water, especially in connection with climate change, are typical for the territories of the river basin. Kashkadarya, therefore they are objects for research work, especially using modern methods, in particular GIS technology. General characteristics of the Kashkadarya river basin. Based on the stock materials of the Uzhydromet of the Republic of Uzbekistan, it has been established that in the mountains of the Kashkadarya region, up to 1000–1350 m in altitude, the duration of the cold period does not exceed 90 days, at altitudes of 1100–1900 m–90–120 days, 1900–2500 m–120–150 days, above 2500 m – more than 150 days. The climatic conditions of the foothills, where Kashkadarya water is used, are determined by a stable thermal depression formed in the summer, associated with overheating of the earth's surface and the influence of tropospheric air masses. The amount of precipitation at this time of year (from June to September) does not exceed an average of 20 mm. Their annual layer is also small: according to data from the station closest to the Chinkurgan reservoir. Kamashi rainfall here is 326 mm per year. The average annual precipitation ranges from 187 mm to 285 mm; in mountainous areas it sometimes exceeds 400 mm.

To assess the influence of climatic parameters of the Kashkadarya territory, a new method of interpolation of climatic data was used. The essence of the new method is that, according to data from existing weather stations in the Kashkadarya River basin, the spatial distribution of weather data throughout the study area has been established. Using the new method, maps of the distribution of meteorological data were created. Using a new method of interpolation of climatic data, maps of the distribution of climatic parameters in the river basin were compiled.

Kashkadarya region occupies 28,568 square meters. km of land area, which is more than 6.3% of the entire territory of the Republic of Uzbekistan. The population of the region today is 2 million 359 thousand 700 people, of which 1 million 710 thousand live in rural areas. The climate here is mild - with warm winters and moderately hot summers, with quite a lot of precipitation.

The main goal of the research presented in this article is to improve water quality and water productivity, i.e. producing more agricultural products and improving the living standards of the rural population using less water while ensuring environmental sustainability and social harmony in the river basin. Kashkadarya in Kashkadarya region.

The Kashkadarya River, flowing from the western ends of the Zarafshan and Gissar ranges, is 310 km long and has a drainage area of 8780 km². In the formation of the river flow regime from the exit from the mountains to the Karshi oasis, the Aksu, Yakkabag, Tankhaz and Guzar rivers play a predominant role. The Guzar River currently does not flow into the river. Kashkadarya.

The Kashkadarya region has the opportunity to dynamically develop the economy while preserving the natural environment, especially water resources, without pollution and without damage to agricultural production. Climatic factors and inefficient use of available water resources in the river basin. Kashkadarya has necessitated the development of measures to create effective ways to manage the use of its water resources.

The main species-forming river of the Kashkadarya region of Uzbekistan is the Kashkadarya River, flowing from the western ends of the Zarafshan and Gissar ranges, 310 km long, with a drainage area of 8780 m². In the formation of the river flow regime from the exit from the mountains to the Karshi oasis, the Aksu, Yakkabag, Tankhaz and Guzar rivers play a predominant role. The Guzar River currently does not flow into the Kashkadarya River. At the same time, the water resources of the Kashkadarya River basin are extremely insufficient to ensure the functioning of economic sectors, primarily irrigated agriculture in the Kashkadarya region. This determines the creation of a large cluster of pumping stations to supply Amudarya water in the Kashkadarya region. The land fund of the Kashkadarya region is 2849.6 thousand hectares. Of these, 667.8 thousand hectares are cultivated areas, 1486.7 thousand hectares are pastures. Surface water resources of the river. Kashkadarya is fully regulated (a mechanism for managing water resources has been created) with reservoirs and other hydraulic structures. The largest reservoirs in the Kashkadarya River basin are the Gissarak and Chimkurgan reservoirs. They are located on the Kashkadarya River. The capacity of the thicket of the Gissarak and Chimkurgan reservoirs is capable of ensuring sustainable management of water resources throughout the Kashkadarya River basin. Reservoirs are capable of long-term regulation of the water resources of the basin; this feature of the reservoirs allows them to become the main "Water Bank" in the river basin. Kashkadarya.

The conducted studies show that when river water is used for irrigation, the greatest load on the river ecosystem occurs during the growing season of agricultural crops, especially cotton. At the same time, the formation of waste water due to water losses from irrigation systems, as well as discharge from industrial and domestic drinking water supply systems and their subsequent merger with the river, negatively affect the state of mineralization of river water.

In connection with the above circumstances, the depletion of the river with existing technologies for using water resources, there is an urgent need, first of all, to streamline the management of quantitative and qualitative indicators of water in the river basin.

Conclusions

1. For the first time, a new method of interpolation of climate data was used to establish the formation and use of river water resources.

2. For water resources management, it is possible to increase the efficiency of water resources management, especially in the case of a change in the formation regime of river flow, due to the influence of climatic factors on the state of glaciers and snowfields in the area where river flow is formed.

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