

DIGITAL TECHNOLOGIES AND THEIR SIGNIFICANCE IN THE FIELD OF WATER MANAGEMENT IN THE CONDITIONS OF DIGITALIZATION OF THE ECONOMY

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Abstract:

The article aims to highlight digital technologies and their importance in the use of water resources. Technical solutions for monitoring the condition of agricultural lands and how to monitor them are shown. It is especially useful to learn about modern electronic devices.

Keywords: scarcity of water resources, digitization in water management, "Smart Water", "Diver", "Rubicon Water" devices.

Introduction

The fact that the demand for water in our country is increasing year by year is becoming increasingly important as a result of global climate change. The water demand of the population of Central Asian countries is met at the expense of transboundary rivers. Studies show that by 2025, as a result of global warming, the supply of glaciers supplying water to the transboundary rivers Amudarya and Syrdarya is expected to decrease by 15-20%. In addition, it was found that the volume of mountain glaciers has decreased by 0.2-1% per year, and the snow reserves in mountain river basins are decreasing. In order to eliminate these and similar problems, first of all, it is necessary to improve the use of water-saving technologies in the irrigation of agricultural crops and fully automate the methods of calculating water consumption, remote control of channels, recording water losses in water facilities and preventing them. can be reached through

Like the changes taking place in all spheres, in the field of agriculture today, digitization and the introduction of digital technologies, positive developments are observed in this sphere.

There are 4.3 million hectares of irrigated land in our country, of which 1.9 million hectares are of various degrees of salinity. As the implementation of the decision of the President of our country dated April 1, 2023 No. PQ-107 "On measures that cannot be delayed to increase the efficiency of water resources use" and similar legal acts in the field, agriculture and a number of measures to increase production efficiency by using digital technologies in water management, to ensure efficient use of water in our country, to expand the introduction of water-saving technologies in the cultivation of agricultural crops, and to improve the reclamation of irrigated lands - activities are being carried out. In particular, starting from this year, for agricultural water consumers, on the application of reduced tax rates for water use when modern water measuring and management technologies are used, and increased tax rates in cases where these technologies are not used, on January 1, 2025 from January, priority tasks such as the introduction of "Water Accounting" IT in all regions of our republic, introduction of automatic generation of tax reports based on the information provided through "Water Accounting" IT were set.

It is known that Kashkadarya is one of the leading regions in our country in the production of agricultural products, although it has a shortage of water resources. 75 percent of water for regional

agricultural crops is supplied from Amudarya through 45 pumping stations in a cascade of 7 lifting pumping stations on the Karshi main canal, 5 percent of water through the Zarafshan River in transit, and the remaining 20 percent of water through the Kashkadarya River and its tributaries, standing water water wells, pumping stations and 62 pumping stations at the expense of the Energy Department and 13 reservoirs collecting a total of 2.5 billion cubic meters of water.

In accordance with the decision of the President of the Republic of Uzbekistan "On measures to further improve the activities of the Ministry of Water Economy of the Republic of Uzbekistan" No. In cooperation with the company Pty.Ltd, a pilot project on automation of water management processes was started. The project was financed by the budget support grant of the European Union. The total cost of the project is 18.2 billion. soum. The Kamashi-Mirishkor canal of Kashkadarya region was selected as an object of automation. "Rubicon Water" offers solutions for automation of open canals, remote control of hydrotechnical structures, their monitoring, accurate calculation of the amount of water in the canal, digitalization of management of irrigation farms, as well as Farm Connect system for automated irrigation of crops. is a leading manufacturer. As part of the project implemented in the region, hydrometers were installed in 25 structures and 3 pumping stations located on the 13.2-kilometer section of the Kamashi-Mirishkor canal, which are intended to irrigate more than 7,000 hectares of irrigated land. The implementation of the project fully automates the work of channel management, water consumption calculation, remote control of the channel, accounting of water losses in the channel.



Figure 1. Parameters of the "Rubicon Water" device installed in the Qamashi-Mirishkor canal



Figure 2. General view of the automation system of water objects "Rubicon Water" installed in the Qamashi-Mirishkor canal

Kashkadarya was considered one of the leading regions in the production of agricultural products in our country. Today, 75 percent of the water for agricultural crops in the oasis comes from the

Amudarya River through 45 pumping stations in the cascade of 7 lifting pumping stations in the Karshi main canal, 5 percent of the water in transit through the Zarafshan River, and the remaining 20 percent from the Kashkadarya and its tributaries, vertical irrigation wells, pumping stations and it is taken from 62 pumping stations and 13 reservoirs that collect 2.5 billion cubic meters of water at the expense of the Energy Department.

According to the information of the administration of the Amu-Kashkadarya Irrigation Systems Basin Department, the lack of precipitation in the spring of last year, the extremely hot summer, and the water resource shortage of 25-30% compared to the previous year, caused a complex water shortage in the region. In particular, despite the fact that 9 large and small reservoirs, which are considered the main water supply, dried up during the irrigation season itself, 4.34 billion cubic meters of water were supplied for the irrigation of economic sectors and industrial needs during the year [7].

A number of projects related to digitalization of agriculture of our country are being carried out. The United Nations Development Program "Strengthening Technical Capacity" project is being implemented within the framework of the "Sustainable management of water resources in rural areas of Uzbekistan" program financed by the European Union in cooperation with the Ministry of Water Economy. Within the framework of the project, the system "Monitoring and information exchange for the reclamation network" of the Republic of Uzbekistan was created. With the help of this system, a database of melioration data obtained from 13 expeditions under the basin administration of irrigation systems of the Republic of Karakalpakstan and regions is formed, and the collected data is collected in the Ministry of Water Management. Information on the level of underground water, mineralization, soil salinity, amount of collector-drainage water and water-salt balance is analyzed through geoinformation systems. This system, in turn, monitors the reclamation of irrigated lands, regulates the level of salt balance in irrigated lands and groundwater, determines and plans agromelioration and agrotechnical measures, improves the condition of irrigated lands, improves the productivity of land and water resources. allows to develop solutions for improvement of collector-drainage networks. In order to create a monitoring system, 14 servers, 52 office equipment, 14 color and multifunction printers, 14 plotters for printing materials in the form of maps, and 150 GPS devices belong to district irrigation departments. used to determine their location when receiving information from reclamation wells and posts. The equipment is equipped with ArcGIS S software and other software.



Figure 3. Overview of the automation system of water bodies used for irrigation of agricultural fields [7]

Over the past years, about six hundred modern information and communication technologies have been introduced to water management facilities in the province. About 300 "Smart Water" devices have been installed in irrigation networks, 300 "Diver" devices that monitor the level of seepage water and the level of mineralization of water in reclamation monitoring wells, and more than 400 devices have been installed on ministry servers. Integrated with In fact, in the past 3-4 years, many changes have been implemented in terms of effective management of water resources, their accounting using modern innovative technologies, and the allocation of a certain portion of private sector revenues to the management of water management facilities based on the principles of public-private partnership. applied. In particular, significant work has been carried out on the transfer of water management objects to the management of clusters. 7.2 thousand km of internal irrigation networks, 5.1 thousand km of collectors serving the area of the clusters were transferred to the management of the clusters based on the document.

In conclusion, it should be noted that the year-by-year increase in the population of our country directly causes an increase in the demand for water resources. In such a situation, the use of digital technologies in the efficient and rational use of water and water resources in agriculture, especially in the field of water management, like other sectors of the economy, becomes effective in meeting the population's demand for agricultural products.

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