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### **IMPROVING THE WATER ALLOCATION MANAGEMENT MECHANISM BASED ON A DIGITAL MONITORING SYSTEM AND DIGITAL PLATFORM**

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#### **Abstract**

This thesis studies the issues of improving water distribution based on the use of digital monitoring systems and digital platforms in water resources management. The study analyzes the possibilities of real-time monitoring and management of water consumption using modern information technologies, including sensors, GIS systems and online platforms. It was found that the introduction of digital technologies serves to reduce water losses, make the distribution process transparent and ensure efficient use of resources. As a result, scientific and practical proposals were developed to optimize the water distribution process and increase economic efficiency in the agricultural sector.

**Keywords:** digital monitoring, water distribution, digital platform, water resources, GIS, sensor systems, smart water management, real-time monitoring, irrigation, resource efficiency.

#### **Introduction**

Effective water resource management is a pressing global issue today. Population growth, climate change, and increasing demand for water in agriculture are increasing the need for accurate and equitable management of water distribution.



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Traditional management methods often lead to water losses and inefficient use of resources.

Therefore, the use of digital monitoring systems and digital platforms in water resource management is emerging as a relevant direction. These technologies allow for real-time monitoring of water consumption, automation of distribution, and transparency of management processes[1].

The purpose of this study is to study ways to improve the water distribution management mechanism based on a digital monitoring system and a digital platform, and to develop practical proposals.

### **Literature review**

In recent years, the use of digital technologies in water resource management has been widely covered in international and domestic scientific research. In particular, within the framework of the Smart Water Management concept, automation of water distribution, real-time monitoring and data-based decision-making systems are considered as important areas.

Reports of international organizations, including FAO, UNESCO and the World Bank, emphasize the important role of digital monitoring systems in the efficient use of water resources, reduction of water losses and optimization of irrigation systems. In these studies, sensor technologies, GIS systems and IoT devices are evaluated as effective tools for monitoring and analyzing water consumption[2]. The scientific literature notes that digital platforms allow for centralized management of water distribution, data integration, and transparency among users. This serves to ensure fair distribution of water resources and prevent excessive losses.

Local studies indicate that high water losses in irrigation systems and incomplete digitalization of management processes in Uzbekistan are one of the main



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problems. Therefore, the need to introduce digital monitoring systems in water management and modernize existing infrastructure is emphasized.

The analysis of the literature shows that improving mechanisms for managing water distribution based on digital monitoring and platforms is an important direction for the effective use of water resources and increasing system efficiency[3].

### **Research methodology**

This study aims to study the effectiveness of digital monitoring systems and digital platforms in water distribution management and identify ways to improve them. The study used a combination of qualitative and quantitative analysis methods.

The theoretical basis of the study was domestic and foreign scientific literature on water resources management, digital economy, smart infrastructure, and smart water management concepts. Reports and statistical data published by FAO, UNESCO, and the World Bank were also used[4].

The research used analysis, synthesis and comparative methods to study the differences between traditional water distribution systems and systems based on digital monitoring. Through this, the advantages and existing problems of digital platforms were identified.

Also, based on a systematic approach, all stages of the water distribution process - water accounting, distribution, control and analysis processes - were comprehensively studied. The practical possibilities of IoT devices, GIS technologies and real-time monitoring systems were assessed.

The study analyzed indicators on the level of water loss, distribution efficiency and management accuracy using statistical and analytical analysis methods.



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Based on the results obtained, scientific and practical conclusions were developed on the improvement of digital platforms.

This methodological approach serves to assess the possibilities of increasing efficiency and ensuring transparency in water distribution through digitalization of the water resources management system[5].

### **Analysis and discussion of results**

The study analyzed the practical effectiveness of digital monitoring systems and digital platforms in water distribution management. The results showed that in traditional management systems, water consumption determination and distribution processes are often based on delayed data, which leads to water losses and inefficient use of resources.

In areas where digital monitoring systems have been introduced, it was found that water consumption is monitored in real time, and the distribution process is carried out with greater accuracy and transparency. With the help of sensor devices and IoT technologies, water flow, pressure and consumption levels are constantly monitored, and cases of overconsumption are quickly detected.

The analysis showed that the use of digital platforms allows for the organization of water distribution based on centralized management. In this case, all information is integrated into a single system and the decision-making process is automated. This reduces human errors and increases management efficiency[6].

### **Conclusions and recommendations**

The results of the study show that the use of digital monitoring systems and digital platforms in water distribution management significantly increases the efficient use of water resources. Compared to traditional management methods, a digital



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approach allows reducing water losses, optimizing the distribution process, and ensuring transparency in management.

Based on the analysis, the following recommendations were developed:

1. Widespread introduction of digital monitoring systems in the water distribution process;
2. Installation of IoT sensors and real-time monitoring systems in irrigation networks;
3. Creation of a single digital platform for water resources management;
4. Automated collection and analysis of data on water consumption and distribution;
5. Digitalization of management processes to reduce water losses;
6. Establishment of an open and transparent information exchange system for users.

The implementation of these proposals will help ensure the rational use of water resources, increase the efficiency of irrigation systems, and achieve sustainable development in the agricultural sector.

### **List of used literature**

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