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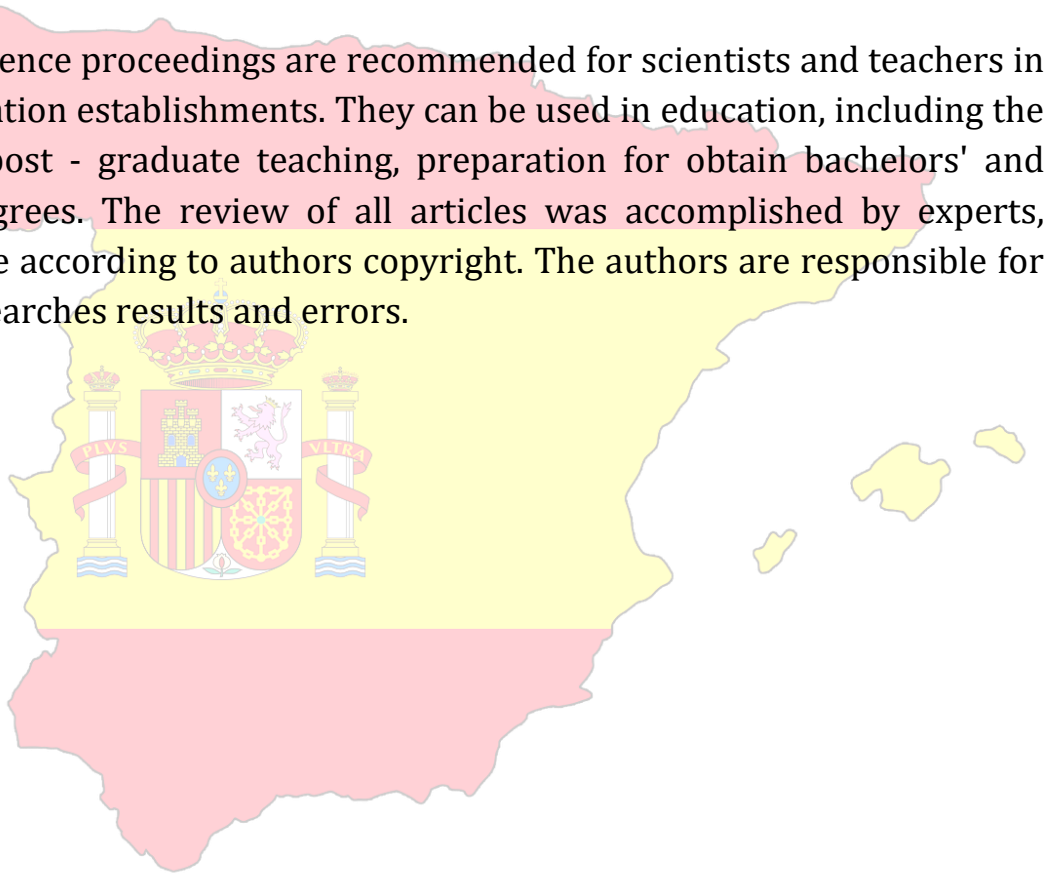

PRIORITY DIRECTIONS FOR IMPROVING MECHANISMS FOR MANAGEMENT OF WATER RESOURCES USE IN ECONOMIC SECTORS

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Abstract: This article considers the issues of improving the mechanisms for managing the rational use of water resources in economic sectors. The goal is to analyze the institutional, economic and technological aspects of water resources management and identify priority areas. The study used comparative analysis, a systematic approach and expert assessment methods. As a result, effective mechanisms for managing water resources were identified and practical recommendations were developed.

Keywords: water resources, management mechanisms, water saving, irrigation, economic regulation, water distribution, digital technologies.

INTRODUCTION

Water resources are the basis of human life and economic activity, and their protection and rational management are gaining global importance today. As a result of the growth of the world population, the development of industry and agriculture, the demand for water resources is increasing year by year. In particular, in the conditions of the Republic of Uzbekistan, this issue is becoming more urgent, since the country is located in the Amu Darya and Syrdarya basins, the most important water resources in the Central Asian region. Agriculture in Uzbekistan accounts for more than 90 percent of water consumption, and irrigation systems are the main water users of the economy. In addition, industrial and municipal sectors also create a large demand for water resources [1]. Therefore, improving the mechanisms for managing the use of water resources has become a strategic necessity for the country's economic stability. The purpose of this article is to analyze the mechanisms for managing the use of water resources in economic sectors and to substantiate priority areas for their improvement.

LITERATURE ANALYSIS AND PROBLEM DESCRIPTION

Water resources management issues have occupied a wide place in the research of foreign and domestic scholars. Rogers and Hall (2003) studied the

institutional foundations of water management and substantiated the need for cooperation between the state, the market, and civil society. Gleick (2014) emphasized the need for a broader interpretation of the concept of water security, showing the combined role of technological innovations and political decisions. In domestic studies, Hamidov, Tashmatov et al. (2018) analyzed the experience of reforming irrigation systems in Uzbekistan and put forward specific proposals for reducing water consumption [2]. Mirzayev (2020) studied the impact of economic regulatory instruments on the efficient use of water resources and showed the need to improve water pricing mechanisms. However, the existing literature has not sufficiently studied the integration of digital technologies and water management, as well as cross-sector coordination mechanisms. This article attempts to fill this gap [3]. In Uzbekistan, a large part of water consumption in agriculture is accounted for by irrigation canals. Water losses in irrigation systems still remain high, reaching 40-50 percent in some regions. The main reasons for this are: Outdated canals and structures, insufficient maintenance. Low level of use of water-saving technologies (drip irrigation, sprinkler irrigation). Lack of modern measuring devices to control water consumption. Lack of a culture of water saving among farmers and peasants [4]. Industrial enterprises, especially the mining and processing sector, consume large amounts of water resources. Many enterprises do not have water recycling systems, and wastewater treatment capabilities are limited. In the energy sector, thermal power plants also require large amounts of water, which negatively affects the water balance [5]. There are losses in water supply systems in cities, and the old pipeline network requires replacement and repair. The lack of widespread use of water meters among the population is an obstacle to promoting water conservation. Municipal water supply services are unstable in many areas, which also remains a problem.

Improving the institutional system for water resources management is a priority task. The following measures are recommended for this purpose. Establishing a special coordination body for inter-sectoral water management, which will coordinate water distribution between the ministries of agriculture, industry, energy and communal services. Strengthening water resources management based on the basin principle and developing a single management policy for each river basin. Expanding the powers of water user organizations (WUs) and ensuring their financial independence. Modernizing legislation in the field of water resources management, in particular, reforming the water rights and licensing system. Economic instruments are an important mechanism for stimulating the efficient use of water resources. Main directions. Reforming the water pricing system: setting water tariffs economically justified, while maintaining social justice. Introducing a progressive tariff system with a low price for low consumption and an increased tariff for consumption above the norm. Expand the system of subsidies and tax incentives for water conservation: preferential terms for enterprises that have introduced drip irrigation and

recirculating water systems. Development of a water quota and trading system will allow for the effective distribution of water resources between sectors based on market mechanisms. Linking KPI indicators for water conservation with state orders and licensing requirements. Technologies of the Fourth Industrial Revolution will allow for a radical increase in the efficiency of water resources management. Expanding the network of water meters and sensors based on IoT (Internet of Things) to monitor water consumption and identify losses in real time. Predicting water consumption and optimizing distribution using artificial intelligence and big data analysis (Big Data). Creating a digital map of irrigation networks based on GIS technologies and strengthening the monitoring system. Using drone and remote sensing technologies in monitoring water facilities. Establishing a single data center for water resources management and openly sharing data with all stakeholders (Open Data). Technological modernization of the sectors is one of the main priorities and includes the following. Widespread introduction of drip and sprinkler irrigation systems in agriculture, which will save water by 30-50% compared to traditional methods. Installation of water supply systems and modernization of wastewater treatment facilities in industrial enterprises. Renewal of water supply systems in cities, especially replacing outdated pipeline networks with high water losses. Widespread introduction of water treatment and reuse technologies in industry.

Cooperation between all stakeholders - the state, the private sector, and civil society - is a prerequisite for sustainable water resource management. Expansion of the public-private partnership (PPP) model in the development of water infrastructure. Support for water user associations and cooperatives, expanding their participation in management. Organization of targeted information and propaganda campaigns to form a culture of water saving among the population and entrepreneurs. Strengthening cooperation with international organizations and neighboring countries on joint management of water resources. Training specialists in the field of water resources management and expanding the scientific and practical base is the basis for long-term sustainability. Development of water management specialization in higher education institutions and integration of foreign experience into curricula. Expansion of retraining and advanced training courses for practitioners. Increasing financial support for scientific research in the field of water resources management.

DISCUSSION

The results of the analysis show that improving water resource management mechanisms in economic sectors requires a multifaceted approach. Relying on only

one technological or economic direction is not enough. The necessary integrated approach combines institutional reforms, economic mechanisms, digital technologies and social factors [7]. The experience of Uzbekistan shows that significant progress has been made in water resource management: the activities of water user associations have expanded, work is underway to modernize irrigation infrastructure. However, new problems associated with climate change, population growth and economic development require more systematic and innovative solutions. The following results can be achieved through priority areas: a 25-35% reduction in water consumption, increased irrigation efficiency, optimization of water consumption in industry and utilities, and long-term sustainable water resources management. The proposed mechanisms allow for the simultaneous implementation of the principles of economic efficiency, social justice and environmental sustainability. Consistent implementation of these directions will be an important step in ensuring Uzbekistan's water security and achieving sustainable economic development.

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