ECONOMICAL WAYS OF USING WATER RESOURCES

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Abstract: Water scarcity is a growing global issue, demanding innovative and cost-effective approaches to manage this vital resource. This article reviews a range of economical strategies for using water resources, including technological advancements, behavioral modifications, and policy interventions. It analyzes the effectiveness and cost-benefit of these approaches, emphasizing their potential to alleviate water stress while minimizing financial burden.

Keywords: Water conservation, Water management, Sustainable water use, Cost-effective strategies, Technological solutions, Behavioral interventions, Policy measures.

Introduction: Water is an essential resource for human life and economic development. However, the increasing demand for water, coupled with climate change and population growth, is placing immense pressure on existing water resources. This has led to a global water crisis, with many regions facing severe water scarcity and conflicts over access. Addressing this crisis necessitates a shift towards sustainable water use practices that emphasize conservation and efficiency.

Work on improving the reclamation of irrigated lands, improving the efficiency of water resources use, improving the system of keeping accounts, as well as strengthening the material and technical base of water management organizations is being carried out consistently. At the same time, the measures implemented for agricultural reform and diversification of agricultural production require further improvement of the water management infrastructure based on the introduction of modern methods of management in this area. The goals are to further improve the system of water resources management and the use of water resources facilities, to ensure the effectiveness of the implementation of irrigation and reclamation projects, to introduce market principles and mechanisms in the field of water management, as well as to develop science in this field. was determined several years ago.

The Minister of Water Management is personally responsible for: ensuring the effectiveness of reforms in the field of water management, expanding and strengthening international relations in the field of water resources management; Timely and high-quality development of the water management development concept in 2020-2030; Starting from 2020, the gradual introduction of mechanisms for reimbursement of a part of water supply costs of water management organizations by water consumers; gradually reducing the share of budget funds in the total volume of costs for the construction, reconstruction and modernization of water management facilities by expanding the attraction of foreign investments, loans and grants for the implementation of promising projects in the field of water management; by actively assisting agricultural producers in introducing water-saving irrigation technologies, by expanding the production capacity of modern irrigation systems at the expense of attracting private investments, increasing the share of irrigated land with the use of water-saving technologies issues such as reaching at least 10 percent of the total area of land have become a number of solutions to water management problems.

Today, thinking about water resources from the economic point of view is becoming the main issue. The prices set for drinking water are the cause of enough discussions in this regard.

The cost of drinking water is different in all our regions. The reason is that the geographical and geological location of our regions, availability of water reserves, delivery distance, fuel costs, monthly salaries of employees, built structures, loans from international financial organizations and similar expenses are included in the tariffs. The most expensive tariff is in Navoi region - residents of the region pay 3,000 soums for 1,000 liters of water. The reason is that there are few water reserves, 20 percent. The remaining 80 percent will be delivered to the population from Samarkand region. This means almost 200 kilometers, the pipelines are laid for such a distance, energy costs require it.

Methods: This review examines a diverse range of approaches for economical water use, drawing from existing literature, research papers, and policy documents. The analysis focuses on: Technological advancements: Exploring innovations like low-flow showerheads, water-efficient appliances, drip irrigation systems, and greywater recycling technologies. Policy measures: Assessing the effectiveness of water conservation policies, regulatory frameworks, and financial incentives in promoting responsible water use.

Analysis: The review reveals that various economical strategies can significantly reduce water consumption without compromising economic growth or quality of life. Water-efficient appliances and fixtures: By using less water per cycle, these appliances offer substantial savings while maintaining functionality. Drip irrigation: This technique efficiently delivers water directly to plant roots, minimizing evaporation and runoff, making it particularly suitable for arid and semi-arid regions. Greywater recycling: Utilizing treated wastewater for non-potable purposes like irrigation and toilet flushing can significantly reduce potable water demand.

Public awareness campaigns: Educating individuals about water conservation practices and the consequences of water scarcity can foster responsible water usage. Water pricing strategies: Implementing tiered pricing systems that charge higher rates for excessive water consumption can incentivize individuals to conserve water. Social marketing: Utilizing campaigns that promote water-saving behaviors through positive reinforcement and peer pressure can effectively change consumption patterns.

Water conservation regulations: Setting mandatory water conservation standards for buildings, industries, and agricultural practices can enforce efficient water use. Financial incentives: Providing subsidies for installing water-saving technologies or offering rebates for water-efficient appliances can encourage investment in sustainable solutions. Water rights management: Implementing equitable and transparent water allocation systems can ensure sustainable water use for all stakeholders.

Results and discussion: The Republic of Uzbekistan is located in the Aral Sea basin, and its main water source is the Amudarya and Syrdarya rivers, as well as internal rivers and streams, as well as groundwater. The average long-term water flow of all sources in the Aral Sea basin is 116 billion cubic meters, of which 67.4 percent is formed in the Amudarya basin and 32.6 percent in the Syrdarya basin. In particular, the total reserve of underground water is 31.2 billion cubic meters, 47.2% of it belongs to the Amudarya basin, and 52.8% to the Syrdarya basin. In accordance with the schemes of integrated use of water resources and their protection of the "Amu Darya" and "Syr Darya" basins, the average multi-year water intake limit for the Republic of Uzbekistan is 64 billion cubic meters. At the same time, in the 1980s, the annual water consumption of the republic was within the multi-year limit, and in recent years, due to global climate change, as well as the problems of transboundary water use, the average annual amount of water used was 51-53 billion cubic meters, including 97.2 percent from rivers and streams, 1.9 percent from collector networks, and 0.9 percent underground, reducing by 20 percent compared to the allocated water intake limit. The area of irrigated land in the republic is 4.3 million hectares, on average 90-91% of the total water resources are in agriculture, 4.5% in the communal household sector, 1.4% in industry, 1, 2 percent was used in fisheries, 0.5 percent in heat energy, and 1 percent in other sectors of the economy.

The territory of the republic has its own soil and climatic conditions, and as a result of the lack of natural drainage and the high level of groundwater mineralization, a number of areas are "primarily saline". At the same time, as a result of the improper use of water resources and the negative effects of other anthropogenic factors, "secondary salinization" of land is observed in some regions, and 45.7 percent of the irrigated land area has varying degrees of salinity. A unique water management system has been established in the republic in order to provide reliable water supply to economic sectors, including agriculture, as well as to improve land reclamation.

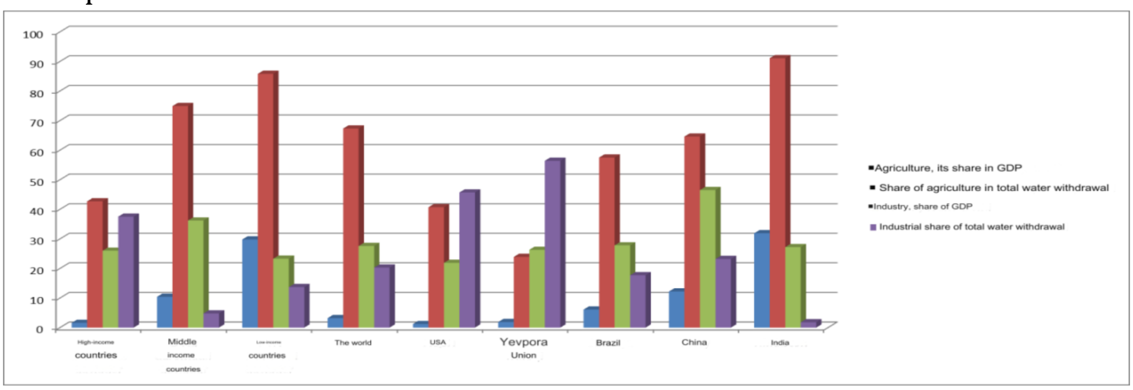
In the water management system, 28,400 km of irrigation system and 54,432 different hydrotechnical facilities are used in them, as well as 70 reservoirs and flood reservoirs with a total volume of 19.4 billion cubic meters. As a result of the uneven distribution of water resources and the fact that the irrigated lands have a complex relief, water is supplied to about 60 percent of the irrigated lands with the help of 1,687 pumping stations, and their annual electricity consumption is 8 billion kWh.

As a result of global climate change, the area of glaciers in Central Asia has decreased by about 30% over the last 50-60 years. According to estimates, the volume of glaciers will decrease by 50% when the temperature rises to 20C, and by 78% when it warms to 40C. According to estimates, water resources in the Syrdarya basin and 15% in the Amudarya basin are expected to decrease by 2050. In the period until 2015, the total water deficit in Uzbekistan amounted to more than 3 billion cubic meters,

It can reach 7 billion cubic meters by 2030, and 15 billion cubic meters by 2050. According to international experts, the current situation and forecasts for the next 30-40 years are very negative. Therefore, a serious problem of water shortage awaits our region in the near future. If so, can the suspected problem be prevented or mitigated? According to industry experts, it is possible, of course. Only, if possible, it is necessary to enter today. Otherwise it will be too late. We have often heard the definition that prevention of disease prevents more problems than cure. Looking at the issue from this point of view, it is understood that in order to prevent or reduce the negative effects of melting glaciers and subsequent water shortages, first of all, it is necessary to achieve ecological stability. The analysis reveals that integrating a combination of technological, behavioral, and policy interventions is crucial for achieving significant water conservation outcomes. Technological solutions offer practical solutions to reduce water waste, while behavioral interventions address individual consumption habits. Policy measures play a critical role in promoting sustainable water use practices through regulation, incentives, and resource allocation.

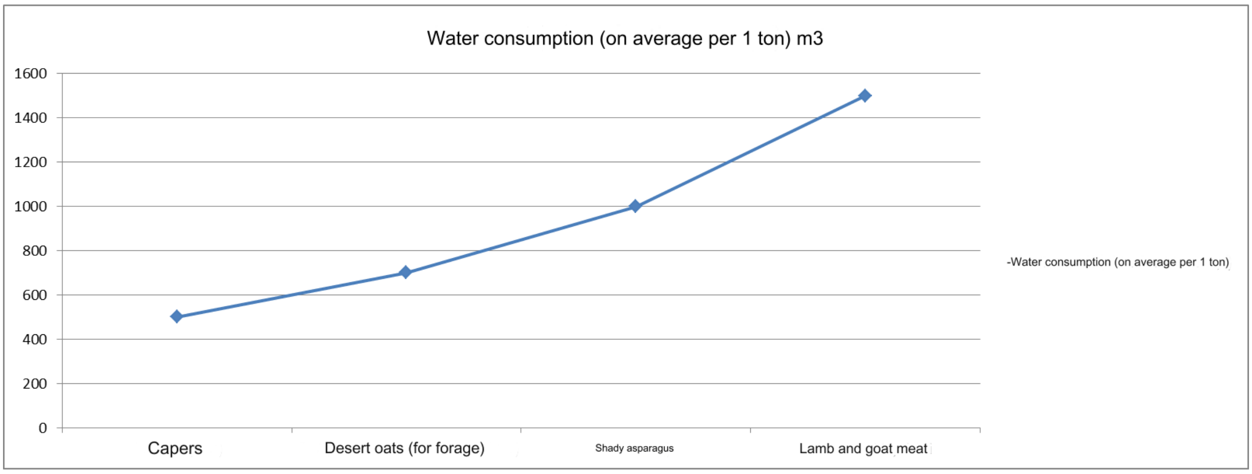
According to experts, 75% of new jobs created worldwide are related to the availability of water resources. Network structural changes will be needed to reduce the impact of this dependency. This necessity is also explained by the fact that the priority of water-demanding industries remains in the economy of many countries. The UN report "Water Resources and Jobs" noted that the problems of water scarcity and access to sanitation services can hinder the economic growth and creation of jobs in the countries of the world. About 70 percent of all available fresh water in the world is used for agricultural irrigation. According to the sectoral distribution of water resources, more than 90 percent of total water is used in agriculture in countries such as Pakistan, Iran, Indonesia, India, and Uzbekistan. In high-income countries, for example, the United States, the share of water used in industry is higher - 46 percent. In Japan, the use of water in housing and communal services is 20 percent.

Comparative analysis of the use of water resources in the sector of the economy in 2020. 1-Graph

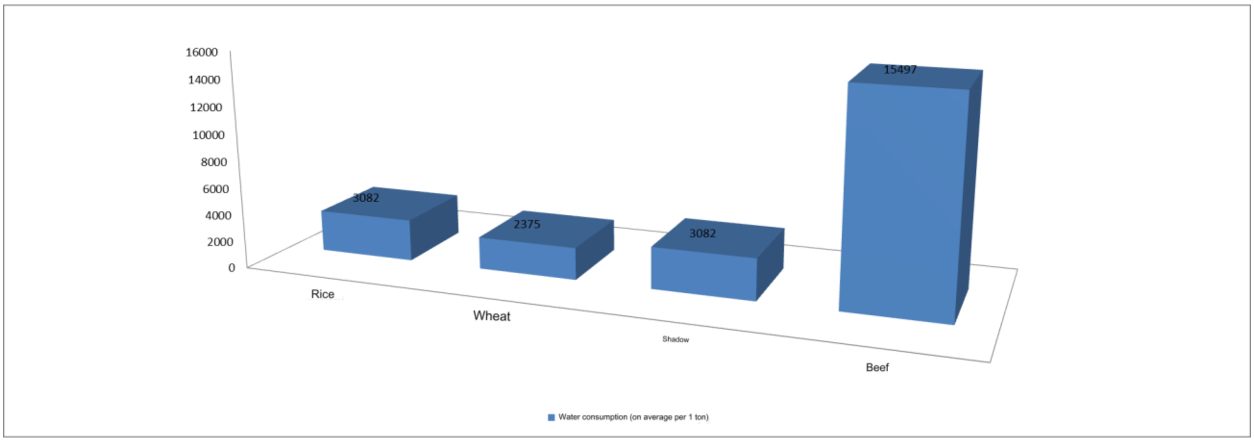


Economical use of water in the world is measured by how much money is earned from each cubic meter of water used. From this point of view, due to the small share of sectors with high demand for water in the economy of these countries, the productivity index of the used water is much higher than in the middle and low countries. For example, in the Japanese economy, on average, each cubic meter of water used brings 53.5 dollars to GDP. In the USA, this figure is 23.5 dollars. In other countries, this indicator is very low, for example, 1 cubic meter of water brings an income of 0.6 dollars for Pakistan and 8.2 dollars for Mexico.

Comparative analysis of water consumption for growing water-intensive and low-water products. Graph 2



Comparative analysis of water consumption for growing water-intensive and low-water products. Graph 3



Based on this, it is impossible to place crops that require a lot of water in Jizzakh, Syrdarya and Khorezm regions and the Republic of Karakalpakstan. It is advisable to gradually expand the area of crops that require less water in these areas. For example, crops such as kovull, tipchak, kongirbosh, desert corn, desert solyanka, and shady asparagus require 10 times less water. Also, drought-resistant legumes such as mung beans, broad beans, peas and red beans are suitable for these areas.

Conclusion:

Adopting economical water conservation strategies is essential for mitigating water stress and ensuring sustainable water use. By embracing technological advancements, implementing effective behavioral interventions, and enacting robust policy frameworks, societies can move towards a future where water resources are managed responsibly and efficiently, meeting present and future needs without jeopardizing environmental sustainability or economic growth. Using water-efficient technologies is a win-win situation for consumers and the environment. By adopting these technologies, we can save money, reduce our environmental impact, and contribute to a more sustainable future. Water conservation measures: Construction of reservoirs. Waste water disposal; Collector - disposal of drainage water; It is necessary to develop ways to reduce the concentration of wastewater.

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