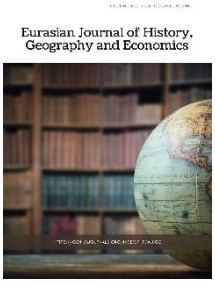

Water Reserves Of Water Reservoirs Of Kashkadarya Region And Issues Of Their Efficient Use

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ABSTRACT

This article covers water resources of Kashkadarya region reservoirs and their future use. The article also talks about economic mechanisms of using regional water reservoirs and issues of water saving.

Keywords: Reservoir, water resources, water saving, economic mechanisms, irrigation

INTRODUCTION. Today, on a global scale, the increase in the world population is leading to a growing demand for essential needs such as food, clothing, electricity, industrial, and agricultural products. This, in turn, necessitates the opening of new lands, the reclamation of deserts, and the utilization of various unused land areas in agriculture in different countries. One of the main issues is to provide these reclaimed lands with modern irrigation and watering systems for agricultural use. To ensure the efficient and productive use of water resources, it is crucial to construct various reservoirs and water storage facilities. Currently, our country is utilizing over 50 reservoirs for various sectors of agriculture and industry. The reservoirs in the southern regions of our republic, namely in the Kashkadarya and Surkhandarya provinces, also play a significant role in the country's irrigation system, being essential bases for raw materials vital to the economy. Therefore, providing water resources to this region is considered an urgent issue. Experts predicted in the 20th century that water would become the most expensive resource, and today those forecasts are beginning to prove true. By 2030, it is anticipated that Uzbekistan will face a water deficit of 7 billion cubic meters, potentially placing the country among the 33 nations experiencing water scarcity worldwide. This situation necessitates the rational use of water in agriculture and the acceleration of water-saving irrigation methods. [1].

MAINBODY. Since gaining independence, our republic has adopted numerous laws in the field of agriculture and irrigation under the leadership of our first president, I.A. Karimov. From the early years of independence, the state has paid special attention to the development of water management. The Ministry of Agriculture and Water Resources established the Department for the Development of Water Resources Balance and Water-Saving Technologies. Today, water resources are managed through 800 large hydraulic engineering structures, including 54 reservoirs with a capacity of 19.4 billion cubic kilometers. In Uzbekistan, many reservoirs of various sizes were built in the second half of the 20th century, primarily to manage river water regimes and generate energy. Their construction and operation continue to serve for drinking

purposes, leading to the design and construction of new reservoirs.

In recent years, several reservoir projects have been planned and constructed in the region of Central Asian countries to utilize river water more efficiently. New projects continue to be developed in the region today.[2]. It looks like you're referencing a table that illustrates your previous points. (Table 1).

Table 1.
Hydrographic Indicators of Reservoirs in Central Asia

Reservoirs	Rivers	Hydrographic Indicators		
		Water Capacity (in million m^3)	Area (in km^2)	Average Depth (in meters)
To'xtag'ul	Norin	19500	284	68,7
Rog'un	Vaxsh	12400	160	77,5
Norak	Vaxsh	10500	98	107
Tuyamo'yin	Amudaryo	7300	790	9.2
Chordara	Sirdaryo	5700	900	7.9
Qayroqqum	Sirdaryo	4200	513	8.2
Chorbog'	Chirchiq	2000	40,3	50
Andijon	Qoradaryo	1750	60	29.1
Tolimarjon	Amudaryo	2530	77,4	19.8
To'dako'l	Zarafshon	875	225	3.8
Kattaqo'rg'on	Zarafshon	845	83,6	10.1
Janubiy Suxon	Surxandaryo	800	65	12.3

The table data is based on the textbook "Natural Geography of Central Asia" by P. Barotov and others.

In 2018-2019, President Sh.M. Mirziyoyev provided several specific directives for the development of irrigation and the improvement of the meliorative condition of irrigated lands. Currently, our country has 448 kilometers of irrigation system canals, 5,259 kilometers of irrigation networks, 3,636 hydraulic structures, 495 pumping irrigation wells, as well as 7,500 kilometers of collector-drainage branches, 13 meliorative pumping stations, and the need to reconstruct and build 185 drainage systems has been emphasized. The Kamashi reservoir is located 4 kilometers from the center of the Kamashi district. The reservoir basin was constructed above the natural riverbed of the Sho'rchasy. Its height is 10 meters, and the water collection area is 900 meters wide. The dam's circumference is 1,500 meters, and its water storage capacity is 11 million cubic meters.

Excess irrigation water from the Yakkabog'daryo and Qorabog'daryo water sources flows into the Kamashi reservoir, along with water from the eastern small mountain streams. Between 1957 and 1962, a technical project was developed by the "Sredazgiprovodxlopok" institute under the leadership of chief architects A.V. Petrov and G.I. Prozorov for the reconstruction of the Kamashi reservoir on the Yakkabog'daryo riverbed. After the project was approved in 1962, the water storage capacity of the Kamashi reservoir increased to 16 million cubic meters following its reconstruction. The construction of the reservoir took five years, and by the beginning of 1962, the construction work was completed. The water discharge capacity of the reservoir is 40 cubic meters per second, which allows for the irrigation of approximately 4,000 hectares of land.

Additionally, in 1971, the reservoir and irrigation canals in the operational water system of the Yakkabog'daryo were cleaned and restored to normal conditions. At the same time,

a project was developed for the construction of the Qorabog‘ floodwater reservoir in the large riverbed of the upper Qizildaryo. Based on this project, the construction work for the Qorabog‘ floodwater reservoir has commenced [3].

The current phase of reservoir construction dates back to the post-World War II period. The reservoirs built during this time were not only aimed at regulating river waters, promoting energy production, and expanding irrigation branches, but also focused on supplying water to cities and industrial areas, improving large natural objects, and enhancing the ecological condition of regions for recreational purposes. The territory of the Kashkadarya region is also not fully supplied with internal water sources. Especially after 1960, the expansion of irrigated farmland, along with the development of numerous reclamation and land improvement projects, created the necessity to search for new water sources. This, in turn, indicated that these tasks could be accomplished through the construction of reservoirs.

The first reservoir in the region began to be constructed in the middle reaches of the Kashkadarya. It is known as the Chimqo’rg’on reservoir and started operating at full capacity in 1963. By this time, it covered a total area of 44.4 km^2. Its total length is 15 km, with the widest point measuring 5.5 km and the deepest point reaching 30 meters. The reservoir has a total water capacity of 500 million cubic meters, of which 425 million cubic meters is considered usable storage.

From 1967 to 1987, a total of 12 large, medium, and small reservoirs were constructed in the Kashkadarya region to ensure the rational use of internal water resources [4].

It is known that in areas with water scarcity, the reservoirs established primarily focus on the rational use of water for irrigation purposes. We conducted research on the amount of water collected in the reservoirs and its usage from 2017 to 2020 in 13 reservoirs located in the Kashkadarya region (Table 2).

In the 2007 irrigation season, a limited amount of 42,681 million cubic meters of water was allocated across the republic. Significant efforts have been made to protect our surface and groundwater resources and to use them rationally. The 31st goal of the "New Uzbekistan Development Strategy for 2022-2026," dated January 28, 2022, is: “***To fundamentally reform the water resource management system and implement a special state program for water”*** is important to emphasize the significance highlighted in this section.

In our country, the construction of 7 new reservoirs has begun with the aim of developing irrigated land. In his congratulatory message on the occasion of Agricultural Workers' Day in 2019, President Sh.M. Mirziyoyev emphasized that the main focus should be on developing dams by increasing the number of reservoirs in our country. He noted that the Parkentsoy, Qizilsoy, and Toshtepa reservoirs were established in the Tashkent region, while the Qoraman reservoir was created in the Jizzakh region. Additionally, the Guldara and Ayoqchisoy reservoirs will be built in the Kashkadarya region, and the Bulung’ur reservoir will be constructed in the Samarkand region. The total capacity of these reservoirs will be 45 million cubic meters.

To improve the meliorative condition of irrigated lands, approximately 1.7 trillion soums (about 205 million dollars) will be allocated from the state budget, along with 84 million dollars from international financial institutions. Over the next two years, sustainable water supply will be established for 1.2 million hectares of land, saving nearly 1.7 million cubic meters of water annually, and 600,000 hectares of land will be developed.

Table 2
The volume of water collected in the reservoirs of Kashkadarya region from 2017 to 2020.

№	Names of the reservoirs	Volume of water collected (in million m^3)

		Year 2017	Year 2018	Year 2019	Year 2020
1	Talimarjon	214,4	213,5	233,9	298.2
2	Chimqo'rg'on	13.2	23.5	106.3	37.4
3	Pachkamar	2	9	105.1	83.2
4	Hisorak	9.5	16.5	65.2	36.9
5	Qamashi	2.1	2.2	6	8.8
6	Dehqonobod	---	----	0.3	15.9
7	Langar	0.7	0.1	2.5	5.2
8	Qorabog'	0.7	0.2	1	3.2
9	Yangiqo'rg'on	0.8	0.4	1.8	1.9
10	No'g'ayli	0.4	0.3	0.4	1
11	Qizilsuv	0.4	0.1	1.1	3.8
12	Sho'robsoy	0.1	---	0.2	1.8
13	Qalqama	0.2	0.1	0.0	2,4
	Jami	**244.3**	**265.8**	**523.8**	**499.7**

The table data is based on the information from the Water Management Authority of Kashkadarya Region.

In this regard, the Cabinet of Ministers adopted a decision on the "Measures for Implementing the Project for the Construction of the Ayoqchi Floodwater Reservoir in the Kitob District of the Kashkadarya Region." The document states that the main project organization, "O'zsuvloyiha" joint-stock company, has developed the technical and economic calculations for the project "Construction of the Ayoqchisoy Floodwater Reservoir in the Kitob District of the Kashkadarya Region," which envisions a reservoir with a volume of 16.8 million cubic meters. The implementation of the project is assigned to the state unitary enterprise "Qashqadaryosuvqurilishinvest" of the Ministry of Water Management of the Republic of Uzbekistan, with the construction completion date set for September 1, 2023.

Additionally, 95% of reservoirs are built on river channels, posing a risk to nearby cities, villages, agricultural fields, and various industrial enterprises. For example, the "South Surxon" reservoir, constructed on the Surkhandarya River with a water capacity of over 800 million cubic meters, continuously threatens the population and environment of the Qumqo'rg'on, Jarqo'rg'on, and Termez districts. This is because natural disasters, exacerbated by anthropogenic factors, could cause the platform to be flooded unexpectedly, leading to dangerous situations [5].

For instance, the tragedy that occurred in May 2020 at the "Sardoba" reservoir in the Sirdaryo region not only harmed the flora and fauna in the area but also rendered thousands of local communities uninhabitable. Therefore, it is essential to constantly monitor such risk-inducing artificial structures and develop emergency prevention measures. The aforementioned situations, in turn, lead to changes in the natural conditions of the areas, including alterations in lithological, hydrogeological, microclimatic, and ecological states, affecting soil, plants, and animal life, and resulting in the formation of new anthropogenic landscapes.

Water is vital for the life of living nature. Among ecological issues, the pollution of water, the scarcity of clean freshwater, and the problem of salinization are particularly urgent. Water is indeed a guarantee of life and existence. At the same time, conserving water and using it wisely must become a habitual practice for each of us, akin to a natural reflex. This situation is not only a social necessity but also a condition for survival. Therefore, shaping the ecological culture of students and instilling a responsible approach to water and its usage is deemed essential.

Table 3.

Legal and regulatory framework for the protection of water resources and their rational use in the Republic of Uzbekistan in recent years (2020-2021).

№	Date of establishment of the legal and regulatory documents.	Legal and regulatory foundations
1	**July10,2020**	Presidential decree: "On the approval of the concept for the development of water management in the Republic of Uzbekistan for the years 2020-2030".
2	**December 11, 2020**	Presidential decision: "On measures to further accelerate the implementation of water-saving technologies in agriculture".
3	**February 24, 2021**	Presidential decision: "On the approval of the strategy for managing water resources and developing the irrigation sector in the Republic of Uzbekistan for the years 2021-2023".
4	**April 6, 2021**	Presidential decision : "On measures to further improve the activities of the Ministry of Water Management of the Republic of Uzbekistan".
5	**April 6, 2021**	Presidential decree: "On measures to further improve the state management and control system in the field of water resource use and to ensure the safety of water management facilities".

Note: the information in the table was compiled by N.M. Suyarqulov.

Conclusion. The study of the geography of reservoirs in the Kashkadarya region, their distribution, and all processes and phenomena related to their activities, as well as identifying and analyzing their characteristics with the geographic environment, is both a natural and economically urgent issue. The construction and use of reservoirs became widespread in the 20th century and reached a planetary level. This was mainly related to their economic and social significance. On one hand, reservoirs are one of the factors of economic development (meeting the population's water needs, serving as an energy source, agriculture, transport), while on the other hand, they have become ecological-landscape factors that negatively impact nature (waterlogging, salinization, large areas remaining underwater, diseases, changes in flora and fauna). This is related to the geography of these reservoirs, their capacity, area, and shape.

The concept for the development of water management in the Republic of Uzbekistan for 2020-2030, as well as the strategy for managing water resources and developing the irrigation sector for 2021-2023, undoubtedly aims to improve the efficiency of water conservation in line with the tasks outlined in these documents.

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