

WATER DIPLOMACY BETWEEN UZBEKISTAN AND KAZAKHSTAN

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Abstract: *This article analyzes the current state of water diplomacy between Uzbekistan and Kazakhstan, the legal and institutional framework for transboundary water resources management, and the prospects for cooperation in the context of climate change. Based on statistical data, the dynamics of water distribution in the Syr Darya basin are studied, and the "water-energy-food" nexus between the two countries is highlighted. At the end of the study, scientific and practical proposals for the digitalization of water resources and the improvement of the integrated management system are put forward.*

Keywords: *Water diplomacy, Central Asia, Syr Darya, transboundary rivers, climate change, digitalization, Aral Sea, hydropolitics, Uzbekistan-Kazakhstan relations.*

Introduction

The current state of global and regional water problems

One of the most acute problems facing humanity in the 21st century is the scarcity of freshwater resources and its impact on geopolitical processes. According to United Nations data, more than 40 percent of the world's population lives under conditions of water shortage. This problem is even more critical for the Central Asian region, since its economy — especially agriculture — depends more than 90 percent on the transboundary rivers Amu Darya and Syr Darya. Uzbekistan and Kazakhstan are not only geographic neighbors but also strategic partners linked by shared river basins. The Syr Darya basin is the main artery ensuring the food security, energy stability, and ecological balance of both countries. For this reason, the use of "water diplomacy" tools in managing water resources has moved to the center of relations between the two states[1-3].

Climate change and hydrological risks

Over the past 50 years, the area of glaciers in Central Asia has shrunk by roughly 20-30 percent, posing a serious threat to the stability of river flows. According to expert forecasts, water resources in the Syr Darya basin are expected to decrease by a further 10-15 percent by 2050. At the same time, population growth and industrialization in the region are increasing demand for water by 15-20 percent



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annually. In such complex hydrological conditions, water diplomacy between Uzbekistan and Kazakhstan has become not merely political dialogue but a regional survival strategy. Amid water scarcity, a new cooperation model based on mutual trust has taken shape between the two states, aimed at the equitable distribution of resources, ensuring the safety of hydraulic structures, and increasing the efficiency of water use[4].

Uzbekistan and Kazakhstan: A new era of diplomacy

As a result of the new regional policy launched in Central Asia starting in 2017, many years of "frozen" water issues began to thaw. At summit-level meetings between President of the Republic of Uzbekistan Shavkat Mirziyoyev and President of the Republic of Kazakhstan Kassym-Jomart Tokayev, the water issue has consistently occupied a prominent place on the agenda[5].

In particular, between the two states a unified position has been formed on:

- Joint management of transboundary water facilities;
- Digitalization and online monitoring of water distribution;
- Improving the ecological situation in the Aral Sea basin.

The purpose of this article is to analyze the evolution of water diplomacy between Uzbekistan and Kazakhstan, to assess the effectiveness of existing legal-institutional mechanisms, and to develop scientific-practical proposals regarding future prospects for cooperation. The object of the study is the processes of managing water resources in the Syr Darya basin and the bilateral agreements in this area[5].

Historical context and legal-institutional foundations

The legal and institutional framework governing water cooperation between Uzbekistan and Kazakhstan began to take shape immediately after the dissolution of the Soviet Union in 1991. As newly independent states inherited an integrated water management system, one of their primary challenges was to ensure the stable management and equitable distribution of transboundary water resources. Rather than pursuing unilateral approaches, both countries supported regional cooperation as the most effective mechanism for addressing shared water-related challenges. A significant step in this direction was the signing of the Agreement on Cooperation in the Management, Use and Protection of Water Resources of Interstate Sources in Almaty on 18 February 1992 by the five Central Asian republics. The agreement established the legal basis for regional water cooperation by recognizing the shared nature of transboundary water resources, maintaining the existing Soviet-era water allocation arrangements on a temporary basis, and confirming the principle that the use of water resources by one state should not cause harm to the legitimate interests of another. These principles became the foundation of water diplomacy in Central Asia and continue to influence regional cooperation today[6].

To implement the provisions of the agreement, the Interstate Coordination Water Commission (ICWC) was established as the principal regional institution responsible for coordinating water allocation and managing interstate water resources. The Commission has played an important role in approving annual water distribution quotas, coordinating the operation of major reservoirs such as Chardara and Kayrakkum, and providing a platform for dialogue during periods of disagreement. In particular, tensions arising from the conflicting priorities of irrigation and hydropower production during the late 1990s and early 2000s were largely managed through negotiations conducted within the framework of the ICWC. Alongside multilateral cooperation, Uzbekistan and Kazakhstan gradually strengthened



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their bilateral legal framework on water management[7-9]. The agreements signed in 1998 concerning the rational use of land, water resources, and related financial mechanisms established the legal basis for long-term bilateral cooperation. Over time, this cooperation expanded beyond technical water management and became an important component of the broader strategic partnership between the two countries.

During the last decade, bilateral water diplomacy has entered a new stage of development. Strategic partnership and allied cooperation agreements have increasingly recognized water security as an essential element of national and regional stability. At the institutional level, permanent joint working groups operating under the water management authorities of both countries have been created to coordinate water releases to the lower reaches of the Syr Darya, particularly during the irrigation season. In addition, both governments have introduced measures aimed at improving transparency through the digitalization of water accounting and monitoring systems. These initiatives have strengthened mutual confidence by providing more reliable information on water allocation and consumption[10].

Research Methodology

This study employed a qualitative and comparative research methodology. Legal documents, international agreements, scientific literature, and official reports on water diplomacy between Uzbekistan and Kazakhstan were analyzed using comparative legal analysis and content analysis methods. Statistical data on the Syr Darya River basin for 2019–2024 were examined to assess trends in transboundary water management. In addition, a systems approach was applied to evaluate the legal, institutional, and environmental aspects of bilateral water cooperation and to formulate practical recommendations for improving sustainable water governance.

Results and discussion

The legal framework for cooperation is also supported by international water law. Both Uzbekistan and Kazakhstan recognize the importance of internationally accepted principles governing transboundary watercourses and increasingly align their policies with the provisions of the 1992 United Nations Convention on the Protection and Use of Transboundary Watercourses and International Lakes (UNECE Water Convention). Although regional cooperation has developed largely through its own institutional mechanisms, the principles of equitable and reasonable utilization, prevention of significant harm, information exchange, and peaceful settlement of disputes reflected in international law have contributed to strengthening bilateral dialogue and promoting more sustainable management of shared water resources[11].

MUTUAL INTERESTS AND STRATEGIC CHALLENGES IN THE SYR DARYA BASIN

The Syr Darya occupies a central place in water cooperation between Uzbekistan and Kazakhstan because it is the principal transboundary river supporting economic activity and environmental sustainability in both countries. Originating in the mountains of Kyrgyzstan and flowing through Uzbekistan, Tajikistan, and Kazakhstan before reaching the remnants of the Aral Sea, the river serves multiple functions, including irrigation, hydropower generation, and ecosystem preservation. Although several Central Asian states share the basin, Uzbekistan and Kazakhstan are particularly dependent on the river's downstream flow. In Uzbekistan, Syr Darya water supports irrigated agriculture in the Fergana Valley, Mirzachul, and Jizzakh regions, while in Kazakhstan it plays a crucial role in sustaining agricultural production in Turkestan and Kyzylorda regions and maintaining the ecological balance of the Northern Aral Sea[12].



Despite these common interests, water management in the Syr Darya basin is complicated by the different economic priorities of upstream and downstream countries. Kyrgyzstan and Tajikistan primarily operate reservoirs to maximize hydropower generation, which requires greater water releases during the winter months when electricity demand is highest. In contrast, Uzbekistan and Kazakhstan require larger volumes of water during the summer growing season to meet irrigation needs. This seasonal mismatch has remained one of the most persistent challenges in regional water management and frequently requires negotiations among the riparian states to balance competing demands[13].

For Uzbekistan and Kazakhstan, however, these differing regional dynamics have strengthened rather than weakened bilateral cooperation. Both countries share similar concerns regarding insufficient water supplies during the irrigation season and excessive water releases in winter, which may increase the risk of flooding in downstream areas. Their common dependence on a stable flow regime has encouraged closer coordination in water allocation, reservoir operations, and emergency response measures, making water management an important area of strategic cooperation between the two governments. An important element of this cooperation involves the coordinated management of major hydraulic infrastructure within the Syr Darya basin, particularly the Chardara Reservoir in Kazakhstan and the Kayrakkum Reservoir in Tajikistan, whose operation directly affects downstream water availability in Uzbekistan. During years of below-average river flow, water reaching the lower reaches of the Syr Darya may decline significantly, creating additional pressure on agriculture and local communities. To reduce these risks, Uzbekistan and Kazakhstan have developed practical mechanisms for cooperation, including coordinated reservoir releases and mutual support through exchanges involving water, energy resources, and other forms of technical assistance. Such arrangements demonstrate that effective water diplomacy increasingly depends on flexible and mutually beneficial solutions rather than on fixed allocation mechanisms alone[14-16].

In recent years, cooperation has also expanded beyond the question of water quantity to include concerns over water quality. As the Syr Darya flows downstream, collector-drainage waters from agricultural areas increase the river's salinity and introduce pollutants that reduce water quality. These environmental changes have particularly affected irrigated agriculture in Kazakhstan's Kyzylorda region, where rice cultivation depends on adequate supplies of freshwater. Recognizing these challenges, Uzbekistan and Kazakhstan have intensified cooperation in environmental monitoring by promoting joint scientific research, improving information exchange, and discussing the establishment of common laboratories for monitoring water quality. Efforts to define environmentally sustainable flow requirements have also become an increasingly important component of bilateral water management, reflecting a broader understanding that long-term water security depends not only on the volume of available water but also on maintaining its ecological quality[17-19].

Dynamics of water flow in the Syr Darya basin (2019–2024)

In this section of the article, we can see the average annual water flow of the Syr Darya and its change at the border between Uzbekistan and Kazakhstan (conventionally, the entry point to the "Chardara" reservoir).

Table 1. Water flow indicators in the Syr Darya basin (km³/year)

Year	Total flow formed across the basin	Volume of water entering the "Chardara"	Ratio of indicator to long-term norm (%)	Hydrological status
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reservoir				
2019	38.4	14.2	105%	Average, high-water
2020	31.2	10.8	85%	Low-water year
2021	28.5	8.4	78%	Sharply low-water
2022	33.1	11.2	91%	Average
2023	30.8	9.6	84%	Low-water
2024	32.5	10.5	89%	Average, low-water

Table analysis: The statistical data show that nearly 80 percent of the last five years fell into a "low-water" period. Notably, in 2021 the water volume was observed to be 22 percent below the norm. Under such conditions, water diplomacy between Uzbekistan and Kazakhstan operated in a "crisis-management" regime.

The decrease in the volume of water entering the Chardara reservoir is explained mainly by changes in the melting patterns of upstream glaciers and higher evaporation during the vegetation period. These figures once again confirm that introducing water-saving technologies is not only an economic but also an ecological obligation for both states[20].

Mutually agreed limits on water distribution

According to bilateral agreements, the following priorities have been established for the use of Syr Darya flow:

1. Ecological flow: The minimum volume necessary to preserve the Northern Aral Sea and the river delta.
2. Sanitary discharges: Preserving the sanitary condition of the riverbed.
3. Irrigation quotas: Approved schedules for the Syr Darya and Jizzakh regions of Uzbekistan and the Turkestan region of Kazakhstan.

CLIMATE CHANGE AND TECHNOLOGICAL COOPERATION: A NEW STAGE

The climate crisis and adaptation strategies

The Central Asian region is warming faster than the global average. Uzbekistan and Kazakhstan have adopted a unified position on mitigating the consequences of climate change. Water diplomacy is now becoming not only a diplomacy of "distributing water" but also of "saving water." Both states are strengthening cooperation within the framework of the Paris Agreement and the UN Sustainable Development Goals (particularly Goal 6: "Clean Water and Sanitation").

"Smart Water" and digitalization

One of the greatest achievements in water relations between Uzbekistan and Kazakhstan is the



digitalization of water resource management. Whereas data on water volumes previously caused mutual mistrust, the following technologies are now being introduced:

- Online monitoring stations: Automated devices installed at strategic hydrological posts along the Syr Darya (such as at important points like "Khudaydadsoy") measure water flow in real time and transmit the data to the dispatch centers of both states.
- Space monitoring: Joint satellite projects are being carried out to track snow reserves in the river basin and the rate of glacier melt. This makes it possible to forecast water inflow more accurately in advance.

Water-saving technologies as a transboundary solution

If Uzbekistan widely introduces drip irrigation on its fields, more water will reach Kazakhstan downstream. For this reason, the two states have agreed to establish joint enterprises for producing water-saving technologies and to exchange experience. This is the practical result of "water diplomacy" — savings on one side ensure the water security of the other.

The Aral Sea and "green" diplomacy

Planting forests on the dried-up bed of the Aral Sea is the largest ecological project of Uzbekistan and Kazakhstan. The two states act in unison to draw international attention to the Aral problem. Reforms within the International Fund for Saving the Aral Sea (IFAS) demonstrate the institutional strengthening of water diplomacy.

Conclusion

The analysis demonstrates that water diplomacy between Uzbekistan and Kazakhstan has developed into a stable and strategic partnership based on political commitment, shared national interests, and an effective legal framework. Despite increasing climate change impacts and growing pressure on regional water resources, both countries have strengthened cooperation through coordinated water management and institutional dialogue. Future progress will depend on modernizing existing agreements, introducing digital technologies such as AI-based hydrological forecasting, expanding joint management of transboundary infrastructure, and strengthening scientific collaboration within the Water–Energy–Food Nexus framework. These measures will enhance regional water security, support sustainable development, and reinforce long-term stability and environmental resilience in Central Asia.

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