

HYDROPOLITICS IN CENTRAL ASIA: THE ROLE OF WATER SECURITY IN SHAPING REGIONAL STABILITY

Ahsan Saeed* & Adam Saud**

Abstract

Water scarcity and competing resource demands among Central Asian states have turned transboundary water management into one of the region's most persistent sources of tension and instability. The study aims to analyze the dynamics of hydropolitics in central Asia with a particular focus on the role of water security in shaping regional stability. The region's geography is defined by two major transboundary rivers, the Amu Darya and Syr Darya, which create a structural interdependence between upstream and downstream states. Upstream states prioritize hydropower generation but downstream states depend heavily on irrigation for agriculture. This divergence of priorities has generated persistent tensions exacerbated by the absence of an effective regional water management framework following the dissolution of the Soviet Union. The study applies the Regional Security Complex Theory to explain how the interdependence of riparian states makes water a regional rather than a purely national security issue. Case studies like the Aral Sea crisis, the Rogun Dam, and conflicts over the Toktogul and Kambarata projects illustrates the dual potential of water to fuel disputes or foster cooperation. The findings suggest that long-term stability in Central Asia depends on re-conceptualizing water as a shared regional interest and establishing cooperative mechanisms that align energy and agricultural needs. These platforms are essential to transform hydropolitics from a driver of conflict into a foundation for regional integration and stability.

Keywords: Hydropolitics, Water Security, Transboundary, Upstream, Downstream, Integration, Stability

* PhD Scholar, Department of Humanities and Social Sciences, Bahria University, Islamabad. Email: ahsan.muhammadsaeed@gmail.com (correspondence author)

** Professor/ Dean Faculty of Humanities and Social Sciences, Bahria University, Islamabad. Email: asaud.buic@bahria.edu.pk

Introduction

The connection between water, power, and the politics is significant for humans and it is obvious when you analyze the history thoughtfully. However, the nature of this connection changes with the passage of time. In the 21st century, the concepts of hydropolitics and hydroconflicts have emerged, which significantly indicates the changes that have occurred in the realm of access to water resources.¹ According to the UN World Water Development Report 2024, tensions over water resources are exacerbating conflicts across the globe and that in order to maintain peace and stability, states must strengthen international cooperation and expand transboundary agreements in this particular domain.²

The concept of hydropolitics was first introduced by John Waterbury in his book "*Hydropolitics of the Nile Valley*". He analyzed how politics is influenced by the availability of water resources. Waterbury defined hydropolitics as "the politics of water resource allocation and management particularly among states sharing international rivers".³ According to Tony Allan, hydropolitics is "the interaction of states and other actors in relations to water resources, particularly in water scarce regions where it shapes both conflict and competition".⁴ Aaron Wolf broadened the definition and explained hydropolitics as "the systematic study of conflict and cooperation between states over shared water resources".⁵ Therefore, Interstate relations on water issues are usually called hydropolitical relations. In the contemporary era, it is an important part of international relations, as well as hydropolitics as a discipline and/or subdiscipline.

There are 276 rivers basin in the world that are shared by more than two countries. In addition, there is power asymmetry between upstream and downstream states.⁶ Furthermore, scholars like Thomas Homer Dixon argues that environmental scarcities can increase the risk of violent conflict particularly in developing world. He introduced three types of scarcity. First, supply-induced scarcity, which means decline in quantity or quality of water

¹Alexey V. Mikhalev, "From geopolitics to hydropolitics: In search of the discipline boundaries," *RUDN Journal of Political Science* 27, no. 1 (2025): 09, <https://doi.org/10.22363/2313-1438-2025-27-1-7-17>.

²UNESCO World Water Assessment Programme, *The United Nations World Water Development Report 2024: water for prosperity and peace*, (UN Water, 2024), <https://www.unwater.org/publications/un-world-water-development-report-2024>.

³John Waterbury, *Hydropolitics of the Nile Valley* (Syracuse, N.Y: Syracuse University Press, 1979).

⁴ John A. Allan, *The Middle East Water Question: Hydropolitics and the Global Economy* (London: I.B. Tauris, 2001).

⁵Aaron T. Wolf, *Hydropolitics Along the Jordan River: Scarce Water and Its Impact on the Arab-Israeli Conflict* (Tokyo: United Nations University Press, 1995).

⁶Anders Jägerskog, "Transboundary water management – why it is important and why it needs to be developed," Stockholm International Water Institute, last modified September 8, 2013, <https://siwi.org/wp-content/uploads/2013/09/TWM-why-it-is-important.pdf>.

due to environmental degradation or climate change. Second, demand-induced scarcity, when population growth or economic expansion increase demand for water. Third, structural scarcity, which means unequal distribution of water among groups or region.⁷

Few regions in the world exhibits as strong potential for conflict over the use of natural resources as central Asia. It has emerged as one of the most conflict-prone regions particularly in terms of water security, where the scarcity and unequal distribution of freshwater resources have turned rivers into instruments of both cooperation and contention. The geography of Central Asia is defined by vast arid plains and deserts that rely on two major transboundary rivers, the Amu Darya and Syr Darya. The Amu Darya originates from the Pamir and Hindu Kush mountains and flows through Afghanistan, Turkmenistan, and Uzbekistan before drained into Aral Sea. The Syr Darya on the other hand, rises in the Tian Shan Mountains of Kyrgyzstan and Uzbekistan, and passes through Tajikistan and Kazakhstan before draining into Aral Sea. These two rivers provide a significant resource for irrigation and energy production in the region. Nevertheless, the geographical asymmetry has created a fundamental upstream–downstream divide. For instance, the upstream countries like Kyrgyzstan and Tajikistan prioritize the use of water for hydropower generation to meet their energy needs. However, the downstream countries like Kazakhstan, Uzbekistan, and Turkmenistan are dependent on large volumes of water for irrigation particularly for water-intensive crops such as cotton. The tension between energy security upstream and agricultural security downstream encapsulates the core of Central Asian hydropolitics.⁸

During the Soviet's rule, this imbalance was managed through a centralized barter system in which upstream states released water for summer irrigation and downstream states compensated them with supplies of oil, gas, and coal⁹. However, since the dissolution of the Soviet Union in 1991, the impact of water distribution and quality on the political and economic trajectories of the newly independent Central Asian republics has become increasingly evident. These states now exercise complete authority over their water resources, yet the transboundary nature of most rivers and streams requires new frameworks of coordination both among themselves and with neighboring countries.

⁷Thomas F. Homer-Dixon, "Environmental Scarcities and Violent Conflict: Evidence from Cases," *International Security* 19, no. 1 (Summer 1994): 5-8, doi:10.2307/2539147.

⁸Shlomi Dinar, "The Geographical Dimensions of Hydro-politics: International Freshwater in the Middle East, North Africa, and Central Asia," *Eurasian Geography and Economics* 53, no. 1 (2012): 129-130, doi:10.2747/1539-7216.53.1.115.

⁹Olimjon Saidmamatov et al., "Water–Energy–Food Nexus Framework for Promoting Regional Integration in Central Asia," *Water* 12, no. 7 (2020): 09, doi:10.3390/w12071896.

Limited land resources, and arid climate that restricts annual and seasonal water availability, and ambiguously defined borders further heighten the risk of regional disputes over natural resources. Hence, the abrupt transition transformed water into a highly contested resource as each state pursued unilateral policies that often clashed with the needs of its neighbors. The absence of a binding regional framework has not only hindered cooperative management but also entrenched water as a source of political friction.¹⁰

Nevertheless, conflict is only one side of hydropolitical coin. In a situation of growing water scarcity, transboundary rivers also provide states with opportunities for cooperation that enables them to collectively benefit from the diverse uses of shared water resources. Although states are often reluctant to share what they regard as their sovereign natural assets. However, historical experience demonstrates that even rivals engaged in high politics or strategic disputes have at times been compelled to collaborate overtly or covertly over the management of their common water resources.¹¹

Therefore, the politics of water management in Central Asia has emerged as one of the most pressing challenges for regional stability in the post-Soviet era. The unequal geographic distribution of water resources with Kyrgyzstan and Tajikistan as upstream states controlling the headwaters of the Amu Darya and Syr Darya. While Uzbekistan, Kazakhstan, and Turkmenistan as downstream states reliant on these flows for irrigation has created a structural interdependence that often generates tension. Upstream countries prioritize hydropower for energy security while downstream states depend on steady water supplies for agricultural production. This divergence in priorities has generated recurring disputes, weakened regional integration, and contributed to environmental crises like the desiccation of the Aral Sea. However, at the same time, the shared dependence on the Amu Darya and Syr Darya illustrates that long-term stability cannot be achieved without cooperative water management. Thus, the research aims to analyze how water security has the potential to transform hydropolitics from a source of rivalry into a foundation for regional stability.

Theoretical Framework

Barry Buzan in his book "*Peoples, States, and Fear*" defines security complex as "a group of states whose primary security concerns link together sufficiently closely that their national securities cannot realistically be considered apart from another"¹². However, later Buzan and Waever in their

¹⁰ David R. Smith, "Environmental Security and Shared Water Resources in Post-Soviet Central Asia," *Post-Soviet Geography* 36, no. 6 (1995): 351, <http://dx.doi.org/10.1080/10605851.1995.10640997>.

¹¹ Arun P. Elhance, "Conflict and cooperation over water in the Aral Sea basin," *Studies in Conflict & Terrorism* 20, no. 2 (1997): 207, doi:10.1080/10576109708436034.

¹² Barry Buzan, *People, States and Fear: An Agenda for International Security Studies in the Post-cold War Era* (Boulder, CO: Lynne Rienner, 1991), 45.

book “*Regions and Power: The Structure of International Security*” developed regional security complex theory within the Copenhagen School of Security Studies. According to RSCT, security is best analyzed not only at the global or national level but also at the regional level where most security interactions take place. In addition, states are grouped into regional security complexes, which means clusters of states whose security concerns are so interlinked that their national securities cannot realistically be considered apart from one another. Therefore, a key assumption of RSCT is that geography matters. Security threats usually travel more easily over short distances than across regions. Consequently, states in close proximity become bound in patterns of amity and enmity that shapes their policies and interactions.¹³

In the context of this study, RSCT is particularly relevant because it allows the analysis of how security interdependence among regional actors’ shapes stability or instability. It illustrates the significance of regional dynamics, the role of neighboring states, and the ways in which external powers may interact with but cannot entirely dictate the security environment. Thus, RSCT provides a theoretical lens to analyze the interplay between regional security concerns and global power politics.

Hence, Regional Security Complex Theory helps to explain why water security issues in Central Asia are inherently regional rather than purely domestic or global. According to Buzan and Wæver, regional security complexes are formed when states’ security concerns are so closely intertwined that they cannot be resolved independently. Central Asia fits this description, as its landlocked geography, shared river basins, and historical legacies create deep interdependencies in water management. The two major transboundary rivers i.e. the Amu Darya and the Syr Darya that originates from the upstream states and flow into the downstream states, this geographical reality binds the region into a security complex where water scarcity along with energy demands and agricultural dependence intersect. Upstream states prioritize hydropower generation but downstream states depend heavily on irrigation for agriculture. Thus, according to RSCT, such interdependence fosters both patterns of amity and enmity. Cooperation is necessary to manage shared resources however, competition often intensifies due to divergent national priorities.

RSCT also addresses the relative autonomy of regional dynamics. The great powers i.e., Russia, China, and the United States exert influence in Central Asia but the water security dilemma originates from the internal configuration of the region itself. The securitization of water that it has been

¹³ Barry Buzan and Ole Wæver, *Regions and Powers: The Structure of International Security* (Cambridge: Cambridge University Press, 2003), 77.

framed as a matter of survival and sovereignty which illustrates how domestic vulnerabilities like food security, energy shortages, or population growth spill over to shape regional politics. Therefore, disputes over water allocation become security threats not only for individual states but for regional stability as a whole.

The Aral Sea: World's Worst Manmade Disaster

The Aral Sea is one of the worst manmade ecological disasters on the planet. It was once the fourth largest inlet sea in the world. Moreover, the Aral Sea has lost over 60% of its surface area, 2/3 of its volume, declined 40m in depth, and has fallen to the eighth largest inland body of water in the world.¹⁴ Central Asia is primarily an arid region, during the Soviet period, Central Asia underwent extensive agricultural industrialization that primarily directed toward the expansion of cotton cultivation which often referred to as “white gold.” Moreover, alongside cotton, there was significant emphasis placed on increasing the output of cereals and other essential crops. Hence, this transformation was closely tied to the broader objectives of the USSR that sought to secure a steady supply of cotton for textile production, enhance food security, and provide employment opportunities for both the local population and migrants from other Soviet republics. Nevertheless, in order to pursue these goals, substantial investments were made in agricultural education and water management. Thus, in 1923, the Soviet authorities established the Tashkent Institute of Irrigation and Agricultural Mechanization Engineers which eventually became the second-largest institution of its kind in the Soviet Union after its counterpart in Moscow.¹⁵

The so-called “hydraulic mission” in Central Asia reached its height between the early 1950s and the 1980s marked by the construction of vast hydraulic infrastructures, particularly the Karakum Canal that stretches 1,375KM and ranks among the world's longest water supply canals. These large-scale projects played a decisive role in the ecological catastrophe of the Aral Sea. Furthermore, the regional water management system came to rely on extensive networks of reservoirs, channelized waterways, embankments, and intensive irrigation schemes that frequently supplemented by pumping stations that extracted groundwater and redirected freshwater into primary and secondary canals. In addition, the Amu Darya and Syr Darya rivers, along with their tributaries, were subjected to relentless exploitation with diminishing volumes of water reaching the Aral Sea. This diversion eventually resulted in severe salinization, the emergence of the Aralkum

¹⁴ Guy Fipps, "Aral Sea Disaster," in *Managing Water Resources and Hydrological Systems* (Routledge, 2020).

¹⁵ Reuel R. Hanks, "'Louder than Words': A Profile of the Destruction of the Aral Sea and Its Consequences," *Asia's Environments: National, Regional, and Global Perspectives* 26, no. 1 (Spring 2021): 08, <https://www.asianstudies.org/publications/ea/archives/louder-than-words-a-profile-of-the-destruction-of-the-aral-sea-and-its-consequences/>.

Desert, and devastating environmental, social, and economic consequences for the entire Aral Sea basin.¹⁶

Nevertheless, the death spiral of the Aral Sea started in 1961 under the leadership of Khrouchtchev, the cumulative pressures of expanding cotton cultivation became evident in the hydrological records from the discharge stations established by the Soviet government along the Amu Darya and Syr Darya rivers, which are close to their deltas. At Timerbay in the Uzbek Soviet Socialist Republic (SSR), the Amu Darya discharged only 29.2 cubic KM of water into the Aral Sea. Even more strikingly, the Syr Darya, measured at Kazalinsk in the Kazakh SSR, recorded no inflow whatsoever. By comparison, in 1960 the two rivers together had contributed 58.8 cubic kilometers, 37.8 from the Amu Darya and 21 from the Syr Darya. Hence, within a single year, the inflow into the Aral had fallen by more than half. Nonetheless, with the exception of 1969, discharge volumes would never again reach the 1960 level over the subsequent three decades. However, by 1974, inflow had dwindled to approximately eight cubic kilometers, and by 1989 had collapsed further to just 4.3 cubic kilometers which is less than one-tenth of the 1960 volume. Consequently, the Aral Sea, which had ranked as the world's fourth-largest lake in 1960 was effectively desiccated by the Soviet pursuit of cotton monoculture, or "white gold," pursued with little regard for ecological sustainability.¹⁷ Thus, the transformations in climate and landscape across the Aral Sea basin are essentially the byproduct of human-induced interventions.



¹⁶ Stefanos Xenarios, "The Aral Sea Disaster and Implications for Regionalism In Central Asia," *Italian Institute for Italian Political Studies*, last modified December 9, 2022, <https://www.ispionline.it/en/publication/aral-sea-disaster-and-implications-regionalism-central-asia-29957>.

¹⁷ Hanks, "Lauder Than Words"

HydroPolitics on Aral Sea in the Post-Soviet Era

After the disintegration of the Soviet Union in 1991, the newly independent Central Asian states sought to secure water resources from the Aral Sea basin in line with their national priorities. The upstream resource-poor countries of Tajikistan and Kyrgyzstan prioritized expanding their hydropower capacity to meet domestic energy needs particularly during the winter months. To this end, upstream reservoirs were reoriented from their Soviet-era function of agricultural irrigation to hydropower generation with water stored during spring and summer and released in winter. However, this shift alarmed the downstream states i.e. Uzbekistan, Kazakhstan, and Turkmenistan that sought to preserve their historical irrigation allocations to sustain agriculture. Hence, reduced summer flows threatened drought conditions, while increased winter discharges risked flooding. The resulting tensions were exemplified by former Uzbek President Islam Karimov's warnings, about a decade ago, that the expansion of upstream hydropower projects could trigger water-related conflicts in the region which was an indication of the high stakes surrounding water governance in post-Soviet Central Asia.¹⁸

Even in the economic and political turmoil, it was evident that while national priorities often outweighed regional concerns. The transboundary nature of water resources and the Soviet legacy of integrated management systems could not be overlooked. In recent years, Uzbekistan under President Shavkat Mirziyoyev has taken significant steps toward reconciliation with upstream states to promote regional initiatives that link energy, water, and food security. Tashkent has even proposed supporting the construction of multipurpose reservoirs in upstream countries in return for benefit-sharing arrangements that involves both energy supply and irrigation water. Kazakhstan has likewise advanced regional cooperation through its efforts to restore parts of the Aral Sea, particularly the so-called "small" or North Aral. The urgency of regionalization is further heightened by climate change, as the glaciers of the Pamir and Tien Shan ranges primarily located in Tajikistan and Kyrgyzstan that remains highly vulnerable to extreme weather events. Their retreat is expected to profoundly reshape hydrological systems across Central Asia that intensifies the necessity of cooperative management.¹⁹

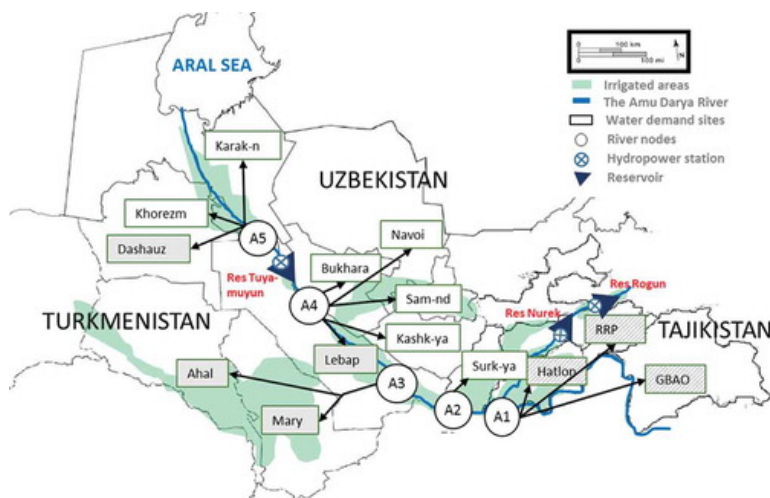
Rogun Dam: Water- Related conflict between Tajikistan and Uzbekistan

The Rogun hydropower plant is flagship infrastructure project of Tajikistan, and symbolizes Dushanbe's pursuit of energy independence and regional electricity exports. Nevertheless, at the same time, it constitutes one of the country's heaviest financial burdens.

¹⁸ Xenarios, "The Aral Sea Disaster".

¹⁹ Ibid

The construction of Rogun Dam was started during Soviet era in 1976; however, it was interrupted by the outbreak of Tajikistan's civil war. Nevertheless, efforts to revive the project in the early 2000s faltered due to disputes with Russian partners. A renewed push came in 2016, when the Tajik government along with World Bank backing, entrusted the primary construction contract to Italy's Salini Impregilo (now Webuild). That same year, the Vakhsh River was successfully diverted that actually enabled construction to resume. However, the Vakhsh river is a principal tributary of Amu Darya, which is the prime source of irrigation for Uzbekistan and its cotton production. In recent years, officials in Tashkent have raised concern over diminishing water availability for its agriculture. As a demonstration of their unease, Uzbekistan withdrew from the Unified Energy System of Central Asia, a Soviet-era framework designed to coordinate energy cooperation among the region's five republics.²⁰



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Nevertheless, for Dushanbe, the Rogun Dam represents a strategic pathway to energy independence and the foundation for expanding energy-intensive industries. However, its revival coupled with the government's decision to restart operations at the Tajik Aluminum Plant, which is the primary source of export revenues. Nonetheless, it has provoked strong criticism from

²⁰ Petr Bologov, "The Rogun Dam: A Source of Division in Central Asia," Carnegie Moscow Center, last modified February 10, 2017, <https://carnegie.ru/commentary/66334>.

²¹ Maksud Bekchanov et al., "How would the Rogun Dam affect water and energy scarcity in Central Asia?," *Water International* 40, no. 5-6 (2015): 858, doi:10.1080/02508060.2015.1051788

Uzbekistan, which views these initiatives as detrimental to its own water and agricultural security.²²

In recent years, Uzbekistan has exerted considerable pressure on Tajikistan through what has been described as an ‘energy blockade.’ In January 2013, Tashkent suspended natural gas exports that had supplied nearly 95% of Tajikistan’s domestic consumption that includes the vital aluminum plant to shift from gas to coal. Uzbekistan’s concerns, however, are not without basis. Uzbekistan ranked among top ten water scarce country but remains heavily reliant on an agrarian economy that burdened by outdated irrigation systems and increased desertification linked to the mismanagement of the Aral Sea basin. Any reduction in the Amu Darya’s flow could devastate its agricultural sector, potentially precipitating famine, mass migration, and broader regional instability.²³

Water Allocation according to 1992 Almaty Agreement²⁴

Country	Syr Darya allocation Percentage	Amu Darya allocation Percentage
Kazakhstan	38.1	0
Kyrgyzstan	1.0	0..4
Tajikistan	9.2	13.6
Turkmenistan	0	43.0
Uzbekistan	51.7	43.0

In the final year of Islam Karimov’s presidency, Uzbekistan and Tajikistan cautiously initiated dialogue over the contentious Rogun Dam. In addition, December 2015 marked the first-ever Tajik–Uzbek foreign ministry consultations, followed by a constructive presidential meeting on the sidelines of the Shanghai Cooperation Organization summit in Tashkent. However, after the death of Karimov in September 2016, Uzbekistan’s leadership shifted its attention toward the presidential elections that raised the likelihood of renewed anti-Rogun rhetoric. Nevertheless, this transitional moment also presented both states with an opportunity to build upon the diplomatic progress of the previous year as a foundation for cooperative approaches to shared energy and water challenges.²⁵

In June 2025, the Government of Tajikistan approved a draft agreement with Uzbekistan concerning the supply of electricity from the Rogun hydropower plant. Under the terms of the deal, Uzenergosotish, which is the state enterprise responsible for centralized electricity trade in

²² Bologov, "The Rogun Dam".

²³ Ibid

²⁴ Sarah L. O'Hara, "Central Asia's Water Resources: Contemporary and Future Management Issues," *International Journal of Water Resources Development* 16, no. 3 (2000): 434, doi:10.1080/713672501.

²⁵ Ibid

Uzbekistan, will purchase power at a rate of 3.4 US cents (approximately 434.2 soums) per kilowatt-hour exempt from value-added tax. Beginning in the second year of deliveries, this tariff is set to increase annually by 1%. In addition, electricity from the Rogun hydropower plant will be supplied alongside imports from Tajikistan's state-owned utility, Barki Tojik. Furthermore, Deliveries will follow a mutually agreed schedule with priority given to periods of electricity shortages within Uzbekistan's Unified Power System. Moreover, during the construction phase of Rogun, exports will take place primarily during the agricultural season (April 1 to September 30). Once the plant achieves full operational capacity, however, supplies are expected to shift to a year-round basis. The agreement has been concluded for a duration of twenty years with provisions for possible extension.²⁶ However, this does not mean that Uzbekistan's core objections have been dropped; instead, the stance seems to be shifting toward a conditional cooperation or conditional acceptance that provided downstream interests (water rights, environmental safety, risk mitigation) are credibly safeguarded

Nevertheless, in order to complete the Rogun HPP, Tajikistan must undertake the installation of six additional turbines to elevate the dam structure from its present height of 135 meters to the planned 335 meters, and mobilize approximately \$6.4 billion in new financing, which is equivalent to nearly 40% of the country's projected 2025 GDP. However, the World Bank has halted additional financing for the Rogun project pending Tajikistan's submission of a credible funding strategy that avoids excessive public debt, the conclusion of long-term electricity export contracts, and the implementation of stringent dam safety measures. Absent these conditions, the Bank has declared it cannot continue its support. In addition, environmental resistance has intensified. The international coalition Rivers without Boundaries has cautioned that filling the Rogun reservoir could diminish Amu Darya flows by more than 25%, exacerbating desertification and threatening the livelihoods of up to ten million people across Uzbekistan and Turkmenistan. Therefore, Tajikistan's broader economic fragility compounds the challenges surrounding the Rogun project. The Rogun Hydropower Plant embodies both a powerful symbol of national ambition and a high-stakes financial risk. Its ultimate legacy whether as a cornerstone of regional energy security or a cautionary example of overextension remains uncertain.²⁷

²⁶ Akbaryusupov, "Tajikistan to Supply Power from Rogun Dam to Uzbekistan," Tashkent Times, last modified July 17, 2025, <https://tashkenttimes.uz/national/15641-tajikistan-to-supply-power-from-rogun-dam-to-uzbekistan?>.

²⁷ Sadokat Jalolova, "Tajikistan's Rogun Dam Delayed as World Bank Freezes Funding," The Times of Central Asia, last modified August 27, 2025, <https://timesca.com/tajikistans-rogun-dam-delayed-as-world-bank-freezes-funding/>.

Toktogul Dam and Kambarata-1: Water-Related Conflict between Kyrgyzstan and Uzbekistan

Tensions between Uzbekistan and Kyrgyzstan are best understood as the legacy of a centrally planned, inter-republic barter system that collapsed with the Soviet Union. As stated earlier, under the Soviet management, upstream republics released summer flows to meet downstream irrigation needs. On the other hand, downstream republics supplied winter energy (coal, gas) for upstream heating and power. However, after the disintegration of the Soviet Union, the centralized system collapsed. Thus, Kyrgyzstan began to control significant portions of the Syr Darya River through reservoirs like the Toktogul Dam and sought to prioritize its domestic energy needs by releasing water in winter to generate hydroelectric power.²⁸ Toktogul's total reservoir capacity is widely reported at about 19.5 billion cubic metres and it supplies a large share of Kyrgyzstan's hydropower. Nevertheless, this practice conflicted with the agricultural demands of Uzbekistan that requires large water volumes during the summer for cotton and wheat irrigation. Consequently, this misalignment created recurrent disputes as Uzbekistan accused Kyrgyzstan of disrupting irrigation schedules. On the other hand, Kyrgyzstan argued that downstream states failed to adequately compensate for water regulation services or provide sufficient energy supplies in exchange.²⁹

The conflict has manifested in several dimensions. Economically, the dispute has strained regional cooperation by disrupting water-energy exchanges and undermining prospects for integrated management of the Syr Darya basin. Politically, it has fostered mistrust and reinforced competitive rather than cooperative approaches to resource governance. In addition, the dispute has escalated into localized tensions along the Uzbek–Kyrgyz border, where communities compete over water distribution for irrigation canals. Furthermore,³⁰ Uzbekistan's resistance to upstream hydropower projects like Kambarata hydropower plants in Kyrgyzstan. Kambarata complex in Kyrgyzstan have been focal points of Uzbek concern. According to technical assessments, Kambarata reservoirs would add several billion cubic metres of storage (projected individual reservoir estimates commonly cited in policy literature are on the order of ~4–5.5 billion m³ for Kambarata-1) which Uzbekistan fears could increase Kyrgyzstan's ability to withhold or re-time flows in ways that reduce summer irrigation supply. However, on the other

²⁸ Kai Wegerich et al., "Water Security in the Syr Darya Basin," *Water* 7, no. 9 (August 2015): 4658–4663, <https://doi.org/10.3390/w7094657>

²⁹ World Bank, *Water And Energy Nexus In Central Asia Improving Regional Cooperation in the Syr Darya Basin*, (Washington, D.C.: World Bank, 2004).

³⁰ Temur Umarov and Alibek Mukambayev, "Central Asian States Have Put Aside Their Territorial Disputes. Why Now?," Carnegie Endowment for International Peace, last modified April 9, 2025, <https://carnegieendowment.org/russia-eurasia/politika/2025/04/kyrgyzstan-tajikistan-border-deal?lang=en>

hand, Kyrgyzstan and some external development actors frame these projects as necessary for Kyrgyz energy security and for regional energy exchanges. The contested economics and perceived asymmetry of benefits have therefore amplified mistrusts.³¹

Chu and Talas Rivers: Water-Related Conflict between Kazakhstan and Kyrgyzstan

The main source of tension is operation and financing of reservoirs, canals, and hydraulic facilities regulating the Chu and Talas rivers that are located in Kyrgyzstan but they also deliver significant irrigation benefits to Kazakhstan's southern agricultural regions like Jamby, and South Kazakhstan provinces. Kyrgyzstan has argued that Kazakhstan should share in the costs of maintaining and modernizing these facilities. On the other hand, Kazakhstan has often resisted paying and framed water as a transboundary natural resource rather than a service. These disputes occasionally cause localized conflicts particularly during dry years when Kyrgyzstan is accused of withholding or mismanaging releases, thereby reducing water available for Kazakh farmers. However, unlike with Uzbekistan, these disagreements have not escalated into broader political confrontation.³²

Nevertheless, some institutional progress has been achieved. In 2000, the two states signed an agreement on the use of water facilities on the Chu and Talas rivers, which stipulates cost-sharing for operation and maintenance.³³ This was later supported by international organizations (UNECE, ADB, UNDP), and it is considered as one of the relatively successful cases of bilateral water cooperation in Central Asia. One of the sources of misunderstanding was the project initiated by Kyrgyzstan to build two more hydroelectric power stations near Kambar Ata but Astana has opposed this plan.

Karakum Canal: water-related conflict between Uzbekistan and Turkmenistan

The conflict between Uzbekistan and Turkmenistan is primarily centered on the Amu Darya. Both states are heavily dependent on the Amu

³¹ Anton Chiugin, "Experts Call for Seismic Study Ahead of Kambarata-1 Hydropower Construction," *The Times of Central Asia*, last modified September 12, 2025, <https://timesca.com/experts-call-for-seismic-study-ahead-of-kambarata-1-hydropower-construction/>.

³² Elene Rodina, Anna Masyutenko, and Sergei Krivoruchko, "Integrated Water Resource Management of Transboundary Chu and Talas River Basins," in *Transboundary Water Resources: A Foundation for Regional Stability in Central Asia* (Springer, 2008), 125, https://doi.org/10.1007/978-1-4020-6736-5_8.

³³ Lea Bure, "Chu-Talas Activities," in *Transboundary Water Resources: A Foundation for Regional Stability in Central Asia* (Springer, 2009), 131, https://doi.org/10.1007/978-1-4020-6736-5_9.

Darya for irrigated agriculture, particularly for cotton cultivation, which remains a cornerstone of their national economies. The Soviet legacy of large-scale irrigation expansion through Karakum Canal in Turkmenistan and extensive irrigation networks in Uzbekistan created a highly water-intensive agricultural model. This system was designed without consideration for sustainability. It eventually generated persistent competition between the two downstream states. However, unlike the upstream–downstream dynamics that characterize disputes between Kyrgyzstan, Tajikistan, and their neighbors, the Uzbekistan–Turkmenistan conflict is a downstream–downstream rivalry. Both states claim significant allocations from the Amu Darya and often exceeding the river’s actual available flow. The problem is compounded by three prominent factors; first, inefficient irrigation systems. Second, high levels of water loss due to seepage and evaporation. Third, poor coordination in water distribution. Nevertheless, disputes often emerge during dry years, when the river’s flow is insufficient to meet both states’ irrigation demands that eventually leads to accusations of unilateral diversions and non-compliance with agreed quotas. In addition, Turkmenistan’s construction and expansion of the Karakum Canal, which diverts vast quantities of Amu Darya water toward the desert for irrigation and urban supply has long been a source of tension. Uzbekistan has frequently criticized Turkmenistan for excessive withdrawals and claims that they undermine water availability for its own agricultural heartlands particularly in the Khorezm and Karakalpakstan regions. However, on the other side, Turkmenistan argues that Uzbekistan’s extensive irrigation schemes and mismanagement of water resources contribute equally to basin-wide inefficiency and scarcity.³⁴

The absence of an effective institutional mechanism for joint management exacerbates these tensions. Both states are members of the Interstate Commission for Water Coordination (ICWC) that was established in 1992 to allocate quotas and regulate water use in Central Asia but its implementation remains weak. Moreover, Political distrust, lack of data transparency, and prioritization of national over regional interests hinder the enforcement of allocation agreements.

From National Interest to Regional Interest: A Path to Stability

Water security is a catalyst for the regional cooperation in Central Asia. 82 million people in central Asia are suffering from water insecurity, and climate change is worsening the situation.³⁵ The future stability of the

³⁴ Igor S. Zonn and Andrey G. Kostianoy, *The Turkmen Lake Altyn Asyr and Water Resources in Turkmenistan* (Basingstoke: Springer, 2014), 100.

³⁵ Ariel Cohen, Wesley A. Hill, and Wilder A. Sánchez, "Central Asia Needs Regional and International Cooperation to Bolster Water Security," Atlantic Council, last modified February 11, 2025, <https://www.atlanticcouncil.org/in-depth-research-reports/report/central-asia-needs-regional-and-international-cooperation-to-bolster-water-security/>.

region is largely depends on how riparian states conceptualize and manage their shared water resources. In the contemporary era, water security is often framed within the paradigm of national interest where upstream and downstream states pursue policies that prioritize immediate domestic gains while overlooking the long-term regional implications. This type of approach not only perpetuates mistrust but also risks escalating competition over already scarce resources. Hence, a sustainable way forward requires that water be redefined as a regional interest and a collective good whose effective management is essential for the stability and prosperity of all Central Asian republicans. This shift in perspective acknowledges the hydrological and economic interdependence of upstream and downstream states. For Instance, on one hand, Kyrgyzstan and Tajikistan endowed with water resources and they are dependent on energy imports and agricultural trade from downstream states like Uzbekistan, Turkmenistan, and Kazakhstan. On the other hand, downstream countries cannot secure their agricultural output and food security without a reliable flow of water from upstream sources. Therefore, recognizing this mutual dependency is central to forging cooperative rather than competitive hydropolitics. In addition, Central Asian countries needs to understand that if they keep confronting each other and keep prioritizing national interests without considering regional approach, and great bargaining, their survival in the near future will be at stake, and the entire region will witness devastating consequences.

Nevertheless, in order to institutionalize this perspective, the establishment of a mechanized regional platform is essential. A water regime should transcend ad-hoc bilateral arrangements and instead provide a multilateral, rules-based framework for managing shared waters. This platform could take inspiration from other regional water governance mechanisms. For instance, the Mekong River Commission, where cooperative data sharing along with benefit-sharing mechanisms and coordinated policies have mitigated tensions. Although Inter-state Commission for Water Coordination of central Asia is established but it is not effective as it should be.

Therefore, several steps need to be taken. First, Joint monitoring and data sharing, a transparent mechanism for the exchange of hydrological data to build trust and reduce uncertainty. Second, Benefits-sharing arrangements, multilateral agreements that ensure that upstream states are compensated through energy swaps as well as financial incentives in exchange for maintaining regulated water flow. Third, Conflict-resolution mechanism, mediation and arbitration tools embedded within regional organizations to prevent disputes from escalating to political or security crisis. Last but not the least, Integrated water-energy nexus policies that recognize the intrinsic link

between hydropower generation in upstream states and agricultural irrigation in downstream states in order to align water releases with seasonal demands. Hence, the reconfiguration of water management from a national interest to a shared regional interest will transform hydropolitics from a source of insecurity into a foundation for regional stability. If Central Asian states collectively embrace water as a shared lifeline rather than a contested resource, it can become a powerful driver of regional integration and stability.

Conclusion

The water security lies at the heart of regional stability in Central Asia. The structural interdependence between upstream and downstream states that are shaped by the shared basins of the Amu Darya and Syr Darya has produced both opportunities for cooperation and recurring tensions. Historical legacies of centralized Soviet management have given way to fragmented national approaches that often intensify competition. However, the persistence of shared vulnerabilities are exemplified by the ecological disaster of the Aral Sea and disputes over major hydropower projects illustrates that unilateral strategies are ultimately unsustainable. Hence, Central Asian states cannot address their water challenges in isolation because their security concerns are deeply intertwined. Therefore, the future of regional stability depends not on treating water as a zero-sum national resource but on fostering cooperative mechanisms that transform hydropolitics into a framework for integration and stability.

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