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Policy Brief

Qush–Tepa Canal Construction – What is at Stake for Central Asia?

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Introduction

Central Asia, historically characterized as a water "hot spot" due to its geographical positioning, arid climate, and dynamic population shifts, has long grappled with water-related complexities, particularly in the aftermath of its post-Soviet transformations. The dissolution of the unified economic system in 1991 prompted newly independent states to establish individual national water management frameworks, significantly altering joint planning, allocation, and management of water resources. In response, the five newly formed Central Asian countries established the Interstate Coordination Water Commission (ICWC) in 1992 to oversee regional water management, initially adhering to Soviet-era water allocation principles. However, dissatisfaction with these arrangements led to a hydro-political deadlock driven by divergent economic pressures and development strategies among Central Asian countries.

In the mid-1990s, upstream nations prioritized reservoir operations for energy production, causing tensions with downstream irrigation demands. Attempts to reconcile these disparities culminated in the Syr Darya agreement, which was effective only between 1999 and 2001, ultimately contributing to a protracted hydro-political deadlock and elevating water into a sensitive and securitized domain.

Presently, the state of Central Asia's water systems remains uncertain, marked by ongoing transformations in regional and national water governance structures. The escalating impact of climate change exacerbates existing challenges, with droughts and water scarcity affecting both upstream energy generation and downstream agricultural irrigation. Additionally, inefficient water utilization, limited availability, and potential adverse climate effects further compound the region's uncertain trajectory, intensifying competition for water resources across all sectors. Amidst these complexities, the recent introduction of the Taliban's Qush-Tepa canal introduces another layer of complexity, heightening tensions and stakes in the region.

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Qosh-Tepa Canal in numbers

In the wake of the Taliban's assumption of power in Afghanistan in August 2021, a significant infrastructure project was initiated with the start of Qush-Tepa canal construction in March 2022. This canal represents a crucial developmental effort by the Taliban administration, aimed at showcasing its ability to stimulate economic growth within the nation. With a workforce of 5,500 individuals and supported by 3,300 units of technical machinery, the project is operating continuously to advance its construction objectives.³

Originally conceptualized in the 1970s, the Qush-Tepa irrigation canal underwent further examination by USAID in 2018. Spanning approximately 285 kilometers in length, 100 meters in width, and with a depth ranging from 6.5 to 8.5 meters, boasting a maximum discharge capacity of 650 cubic meters per second (m³/s), its primary objective is to facilitate irrigation across an estimated 550,000 hectares of land in northern Afghanistan.⁴ Positioned at the primary Amudarya river in Kunduz Province, the canal will annually draw over 10 billion cubic meters of water from the Amudarya upon its completion.⁵ Furthermore, plans include the construction of three reservoirs for water storage and hydroelectric power generation, anticipated to have a capacity to store up to 9 cubic kilometers (km³) of water. The construction costs for the Taliban are estimated to be around \$700 million.⁶

Potential Impacts on Central Asia

While the canal holds promise for improving domestic economic conditions, its potential ramifications on neighbouring countries could be adverse. The Qosh Tepa canal, upon its completion, is projected to utilize a maximum of 13 km³ of water sourced from the Amu Darya river.⁷ Of notable concern is that over 80% of this water abstraction is anticipated to coincide with the regional planting season, exacerbating the strain on the already limited water resources of the

³ The Economist. 2023. The Taliban are digging an enormous canal. <https://www.economist.com/asia/2023/02/16/the-taliban-are-digging-an-enormous-canal>

⁴ Gafurov et al. Impacts of Qush Tepa Canal on the Agriculture Sector in Uzbekistan, June 2023, Policy Study Uzbekistan, German Economic Team (<https://www.german-economic-team.com/uzbekistan>)

⁵ Water, Peace and Security (WPS) Partnership. 2023. Navigating Water (In)security in Taliban's Afghanistan. Insights into Local, National, and Regional Water Security Challenges. Report. <https://waterpeacesecurity.org/files/380>

⁶ Gafurov et al. Impacts of Qush Tepa Canal on the Agriculture Sector in Uzbekistan, June 2023, Policy Study Uzbekistan, German Economic Team (<https://www.german-economic-team.com/uzbekistan>)

⁷ Feasibility Study Main Report (Volume I). Khush Tepa Irrigation Scheme and Power Generation (KTISPG) Feasibility Study Project. AACCS Consulting in association with Bets Consulting, Kabul, Afghanistan, December 23, 2019

Amu Darya River. Moreover, the implementation of this canal would result in a threefold increase in Afghanistan's utilization of the Amu Darya River's water, which currently stands at 5 km³. It's important to recognize that the Amu Darya River basin contributes approximately half of Afghanistan's renewable water resources. However, the country's susceptibility to the impacts of recurrent droughts and floods is heightened due to inadequate infrastructure and water storage capacity.

The water resources of the Amu Darya River, already under significant strain due to the impacts of climate change and glacier melt, face the prospect of further deterioration without effective coordination. Afghanistan's heightened utilization of shared water resources carries significant implications for neighbouring riparian nations, notably downstream Uzbekistan and Turkmenistan. These countries heavily depend on over 80% of the basin's total renewable water resources, primarily for agricultural purposes.⁸ Addressing this challenge would require several years and substantial financial investments from both Uzbekistan and Turkmenistan to reduce their water consumption, either through improving irrigation efficiency or scaling back irrigation activities. However, it is crucial to acknowledge that such measures could also potentially result in the displacement of population in these countries causing negative social and societal spillovers.

Furthermore, the conditions within the Aral Sea are poised to undergo further deterioration with a subsequent reduction in water volume, which could potentially negate ongoing initiatives aimed at mitigating ecological issues. The Aral Sea, once recognized as the fourth largest inland sea globally, has experienced a dramatic reduction in size due to regional water competition and outdated water allocation practices inherited from the Soviet era.

In addition, Central Asia is undergoing accelerated temperature rises, exceeding the global average.⁹ While the average annual temperature in Central Asia has risen by 0.5 degrees Celsius over the last three decades, it is further poised to increase by 2.0 to 5.7 degrees Celsius by 2085.¹⁰ Increasing temperatures lead to

⁸ Umirbekov, A., Akhmetov, A., & Gafurov, Z. (2022). Water–agriculture–energy nexus in Central Asia through the lens of climate change. Research project report. Central Asian Regional Economic Cooperation Institute. <https://www.carecinstitute.org/wp-content/uploads/2022/08/Report-onWater%E2%80%93agriculture%E2%80%93energy-nexus-in-Central-Asia-through-the-lens-of-climatechange.pdf>

⁹ CAREC Institute 2020. Climate Vulnerability, Infrastructure, Finance and Governance in CAREC Region. Research Report. Urumqi, 2020

¹⁰ SIPRI (Stockholm International Peace Research Institute) 2018. Central Asia – Climate Related Security Risk Assessment. Expert Working Group Report. Stockholm, 2018.

higher evaporation rates, thereby reducing the amount of water in rivers, lakes, and reservoirs. This trend will exacerbate water stress, hasten glacier melting, resulting in short-term water surges, and significantly reduce glacier runoff in the long term. Decreased water availability coupled with more frequent heatwaves will adversely impact crop productivity and food security.

The current water allocation framework for the Amu Darya River, established under the 1992 Almaty Agreement, must consider Afghanistan's potential future water requirements. The construction of the Qush-Tepa canal challenges existing usage patterns and regional water-sharing protocols. Without collaboration with Afghanistan, the repercussions on downstream communities, especially those reliant on irrigation systems and the environment, could worsen. The lack of clarity regarding upstream planning hampers the ability to prepare for anticipated fluctuations in water flow. Climate-related uncertainties will only exacerbate these challenges, affecting the fragile regional water allocation systems across other riparian nations within the broader Aral Sea Basin.

Agricultural water consumption exceeds 90% in both Uzbekistan and Turkmenistan. The Qush-Tepa canal is primarily intended for irrigation, with a projected peak water abstraction of around 10 km³ between May and August, aligning with the regional cropping season. This heightened demand places additional strain on available water resources, particularly affecting regions at the end of irrigation systems and those cultivating less water-intensive, complicating the shift to alternative crops.

As per the SIC ICWC, during dry years, riparian countries within the Amu Darya River basin receive only half of their water requirements. Over the past few decades, approximately 150-200 thousand hectares of irrigated lands in the lower Amu Darya basin have been abandoned due to irregular irrigation practices.¹¹ Additionally, an estimated 400,000 individuals have migrated from northern Uzbekistan to central areas of the country or Kazakhstan, primarily due to environmental degradation and water scarcity concerns. Regions heavily reliant on the Amu Darya River's flow, such as Karakalpakstan, Khorezm, and Bukhara provinces in Uzbekistan, will face the most significant impacts.¹² Reduced water availability will also affect agricultural lands in Kashkadarya (75-85%) and Surkhandarya (55-65%), leading to soil degradation in arable areas and pastures. Furthermore, a 35% decline in the Amu Darya River's flow could

¹¹ <http://www.cawater-info.net/amudarya>

¹² Gafurov et al. Impacts of Qush-Tepa Canal on the Agriculture Sector in Uzbekistan, June 2023, Policy Study Uzbekistan, German Economic Team (<https://www.german-economic-team.com/uzbekistan>)

result in a GDP reduction of 0.7 to 6 percent and the loss of 250,000 jobs in Uzbekistan.¹³

In Turkmenistan, the most of irrigated areas rely on water resources from the Amu Darya River. The country diverts more than 30% of the Amu Darya flow through the Karakum Canal, crucial for irrigated agriculture in regions like Lebap and Dashoguz. A reduction in river flow would likely impact rural populations and the irrigated agriculture sector, particularly the state-owned cotton industry. Despite facing water shortages, Turkmenistan has heavily invested in desert greening projects through massive irrigation infrastructure such as the Karakum Canal and the Golden Age Lake¹⁴.

Salinity affects agriculture productivity and entails health and economic impacts on the populations. Water salinity is already high in the Amu Darya region, with over 50% of the irrigated lands affected by soil salinity in Uzbekistan¹⁵. This number is even higher in Turkmenistan¹⁶. According to a study by the World Bank, 10-15% of the total water used for agriculture in Uzbekistan is used for salt leaching¹⁷.

The anticipated reduction in water quantity due to Qush-Tepa canal's water extraction is likely to worsen water quality degradation in the basin. Agricultural drainage and return water along the canal's right side, where most irrigation is planned, could lead to further water quality deterioration downstream. Additionally, the sandy soil composition along the canal may give rise to new environmental challenges such as reduced water delivery efficiency, waterlogging, increased salinity, and deterioration of groundwater quality (including arsenic, fluoride, and other heavy metals) in the Amu Darya River basin.

¹³ ibid

¹⁴ Collado E. R, Water War in Central Asia: The Water Dilemma of Turkmenistan, 2015, Geopolitical Monitor ([Water War in Central Asia: the Water Dilemma of Turkmenistan | Geopolitical Monitor](#))

¹⁵ Hamidov, A et al. Operationalizing water-energy-food nexus research for sustainable development in social-ecological systems: An interdisciplinary learning case in Central Asia. *Ecol. Soc.* 2022 (<https://doi.org/10.5751/ES-12891-270112>)

¹⁶ UNECE, Environmental Performance Review of Turkmenistan reveals soil salinity, waterlogging, land degradation and biodiversity losses are top environmental challenges for the country, 2012, (<https://unece.org/press/environmental-performance-review-turkmenistan-reveals-soil-salinity-waterlogging-land>)

¹⁷ Akramkhanov A., Akbarov A., Umarova S., QB Le 2021. Agricultural Livelihood Types and Type-Specific Drivers of Crop Production Diversification: Evidence from Aral Sea Basin Region. Sustainability 15 (1), 65

According to the World Bank, one-third of the population in Central Asia, totalling 22 million, already lacks access to safe water¹⁸. Around one-third of Uzbekistan's population (rural and urban) lives in areas dependent on irrigation water supply from the Amu Darya River. Furthermore, 47% of Turkmenistan's population is employed in the agriculture sector. Presently, 7.8 million individuals reside in districts of Uzbekistan that could be affected by Qush-Tepa canal water withdrawals, with populations in these regions expected to increase to 8.7 million by 2030 based on current population growth rates.

A report from the German Economic Team suggests that Uzbekistan could potentially lose 250,000 jobs if Qush-Tepa canal withdraws 25% of water intake.¹⁹ The most vulnerable populations reside in regions heavily reliant on the Amu Darya's water flow, such as Khorezm and Karakalpakistan. These areas, already experiencing significant out-migration, may face heightened risks and migration pressures due to increased water stress. Vulnerable groups, including female-headed households, are particularly affected, facing elevated risks of productivity losses due to drought, decreased agricultural yields, limited access to clean water, and reduced coping mechanisms.

The adverse effects on women, especially in rural agricultural areas, which are already economically marginalized, will be further exacerbated in the affected regions. Informal and seasonal agricultural work, such as cotton harvesting, offers limited opportunities for women to generate cash income, despite challenges related to poor working conditions and inadequate payment for their labor.

Concluding remarks and recommendations

In conclusion, Afghanistan's pursuit of water resource development as an upstream, latecomer country presents a complex dynamic within the regional context. The existing premature water-sharing agreements constrain Afghanistan's future utilization of shared rivers, given its limited water resources. Nevertheless, the Afghan government's investment in independent river development aims to garner public support and bolster its population base, driven by years of deprivation, transit route closures, and mistreatment of Afghan refugees in neighbouring countries.

¹⁸ Jennifer J. et al. Central Asia: at the confluence of global water action and climate resilience Dushanbe conference to emphasize role of water in sustainable development, 2022, The World Bank Water Blog ([Central Asia: at the confluence of global water action and climate resilience Dushanbe conference to emphasize role of water in sustainable development \(worldbank.org\)](https://www.worldbank.org/en/news/feature/2022/06/22/central-asia-at-the-confluence-of-global-water-action-and-climate-resilience-dushanbe-conference-to-emphasize-role-of-water-in-sustainable-development))

¹⁹ Gafurov et al. Impacts of Qush-Tepa Canal on the Agriculture Sector in Uzbekistan, June 2023, Policy Study Uzbekistan, German Economic Team (<https://www.german-economic-team.com/uzbekistan>)

The challenges of water availability in the Amu Darya basin are exacerbated by excessive water withdrawal and competition, with climate change projections further complicating the situation. The impending construction of the Qush-Tepa canal will exacerbate these pressures, highlighting the inadequacy of existing regional platforms to address these challenges effectively. However, these shared challenges also present opportunities for collaboration and mutual benefit, providing a foundation for identifying common opportunities.

The repercussions of water withdrawal from the Amu Darya will extend to Central Asian countries, particularly Turkmenistan and Uzbekistan, impacting riverbank stability and necessitating additional costs for water pumping to irrigation canals. Moreover, Afghanistan's lack of high productivity and technological agriculture further complicates efforts to improve the water situation.

Addressing these challenges requires a **multi-track approach** to establish sustainable water relations between Central Asia and Afghanistan. **The first track** involves enhancing agricultural cooperation, promoting responsible water use, and supporting productivity in existing irrigated areas. It is crucial to offer extension support and advocate for enhancing productivity in existing irrigated areas, while also discouraging the expansion of new, low-productivity lands under irrigation. Additionally, efforts should be made to improve water access for established irrigated sites.

The second track focuses on enhancing trade, energy supply, and capacity building in Afghanistan's technical and agricultural sectors. Additionally, joint research on water improvements and climate-resilient water management in Afghanistan is essential.

The third track emphasizes the development of a political-diplomatic platform for crafting regional or bilateral water agreements. Initiatives such as the UNRCC, Green Central Asia, and Blue Peace could facilitate dialogue between Afghanistan and Central Asian countries, with the International Fund for Aral Sea serving as an institutional framework for inclusive water cooperation activities.