Fragmented Governance over Shared Waters: Pathways to Improved Coordination in the Kura-Aras Basin

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Executive Summary

The Kura and Aras rivers are the lifeline of the South Caucasus, essential for drinking water, agriculture and energy generation. However, water security in the region is under threat due to climate change, the impact of which is worsened by the limited cooperation between the riparian states. The basin lacks a multilateral governance framework, with cooperation taking place only at a bilateral level and complicated by the region's history of conflict. This policy brief shows how the Kura-Aras basin can move beyond fragmented, nationally driven approaches, with data sharing as key in working towards more coordinated and resilient forms of basin-wide water governance.

1. Introduction

The Kura and Aras[1] basin is the lifeline of the South Caucasus, originating in Türkiye, flowing through Georgia, and forming borders between Armenia and Iran before converging in Azerbaijan and draining into the Caspian Sea.[2] In recent years, mounting pressures on these transboundary water systems have emerged from a combination of rapid population growth, accelerated industrial and agricultural development, and increased water use for hydropower. These pressures are intensified by climate change, manifested in declining precipitation, rising evaporation, and glacier retreat, among others. Together, these trends point towards a condition of "water bankruptcy" at the regional scale, whereby growing and competing demands increasingly strain the availability, quality, and resilience of water resources.[3] The Kura–Aras Basin thus reflects a broader global trend that prompted the United Nations University Institute for Water, Environment and Health to declare "global water bankruptcy" in January 2026.[4]

[1] "Kura" and "Aras" are used here, although alternative names and spellings appear in the respective national languages: Kur and Araks/Arax in Armenian, Mtkhvari in Georgian, and Kür and Araz in Azerbaijani.
[2] See Map 1.
[3] Kaveh Madani, Amir AghaKouchak, and Ali Mirchi, "Iran's Socio-Economic Drought: Challenges of a Water-Bankrupt Nation," *Iranian Studies* 49, no. 6 (2016): 997–1016.
[4] Kaveh Madani, "Global Water Bankruptcy: Living Beyond Our Hydrological Means in the Post-Crisis Era," United Nations University Institute for Water, Environment and Health (UNU-INWEH), Richmond Hill, Ontario, Canada, 2026.



Figure 1. The Kura-Aras River Basin.
Source: EUWI+ (based on U.S. Geological Survey data)

Political tensions in the region—including the Second Karabakh War (2020), the ongoing Russia–Ukraine War, and the recent US-Israeli attacks on Iran—have complicated water cooperation between the countries of the basin. In such a delicate regional context characterised by political disagreements, divergent national interests, and mutual mistrust, maintaining dialogue over shared waters presents a unique opportunity for confidence-building measures and development of a common ground among technical experts, civil society organisations, and citizens. Third-party actors play an important and constructive role supporting such efforts and promoting peace and security. The European Union (EU), for instance, has recently launched a new €200 million grant package to foster logistics, energy, and digital connectivity in the South Caucasus, with an additional €20 million dedicated to a peace-fostering programme for local populations in both Armenia and Azerbaijan.[5] Such initiatives can contribute to regional security and economic integration, both within the South Caucasus and with the EU. Against this backdrop, addressing the basin's persistent hydropolitical challenges requires not only greater cooperation among riparian states, but also a clearer understanding of the governance gaps that continue to hinder basin-wide action.

This paper problematises the current hydropolitical status quo in the Kura–Aras Basin and raises a central question: *how can riparian states in the Kura–Aras Basin move beyond fragmented, nationally driven approaches towards more coordinated and resilient forms of basin-wide water governance?* The paper first examines the state of water security in the basin before assessing its governance landscape and the challenges it presents. It then draws on the experience of transboundary water management in the Euphrates–Tigris Basin (ETB), where Türkiye is also the upstream state and "the gatekeeper of the basin's hydrological lifelines",[6] to identify lessons for the Kura–Aras Basin. The paper concludes with policy recommendations

[5] European Commission, "EU launches connectivity and communities support programmes for peace in the South Caucasus" July 1, 2026.
[6] Hussam Hussein, Ahmet Conker, and Milad Jafari, "Rethinking Geography and Power in Transboundary Water Relations: A Critical Reading and Integration of Physical, Social and Political Geography," *Geoforum* 167, no. 10447 (2025): 4.

for third-party actors to foster dialogue and support more equitable, sustainable, and inclusive basin-wide water governance in the South Caucasus.

2. Water security in the South Caucasus

Water security is a concept with considerable political currency but remains essentially contested.[7] Its growing prominence as an academic and policy concept is closely associated with increasing attention to the links between water scarcity, climate change, and the potential for local, national, regional, and international conflict. In this paper, we adopt the Global Water Partnership's broader conception of water security, defined as a condition in which "every person has access to enough safe water at affordable cost to lead a clean, healthy and productive life, while ensuring that the natural environment is protected and enhanced."[8]

Water demand has risen substantially across the Kura–Aras Basin, with national-level annual withdrawals increasing between 2000 and 2017 by 32% in Armenia, 22% in Georgia, and 10% in Azerbaijan.[9] These pressures have led to reduced river flows and a growing reliance on groundwater resources, with withdrawals rising by 25% in Georgia, 100% in Armenia, and nearly 400% in Azerbaijan since 2000, while water extraction in Türkiye's Caucasus ecoregion increased by 25% between 2000 and 2020.[10] The river basin includes 100% of Armenia, about 80% of Azerbaijan and about a half of the territory of Georgia. It represents an important area of economic growth for Türkiye and Iran alike. These pressures on water in the basin have raised concerns about water security in the region.[11]

These trends are likely to place growing pressure on ecosystems and livelihoods in the region. Expanding use of depletable water resources increases the risk of soil erosion, saltwater intrusion, and desertification, in both upstream and downstream states. In Türkiye, for instance, more than 5 million hectares of the 8.5 million hectares of economically irrigable land has been opened to irrigation, with this figure expected to increase further.[12] In Azerbaijan, too, irrigated land nearly doubled from around 1 million hectares in the early 2000s to 1.8 million hectares by 2019 as part of an agriculture-led growth strategy, placing further strain on already limited resources.[13] New data suggests that 0.6 million hectares or 30% of all arable land in Azerbaijan is salinized due to poor irrigation techniques, overgrazing, and groundwater over-abstraction.[14]

Climate change is also increasing hydrological variability across the basin, producing hotter conditions, higher evapotranspiration, more frequent droughts, and more intense rainfall events that increase flood risk and sediment loads.[15] In Türkiye, a 100-year flood could affect around

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[7] Farhad Mukhtarov and Aleh Cherp, "Water Security," *Oxford Bibliographies in Environmental Science*, March 10, 2015.
[8] Global Water Partnership, *Towards Water Security: A Framework for Action* (Stockholm: Global Water Partnership, 2000), 1.
[9] United Nations Environment Programme, *Caucasus Environment Outlook*, 2nd ed. (Arendal, Tbilisi, and Vienna, 2024), 97–98.
[10] Ibid.
[11] Farhad Mukhtarov and Douwe van der Meer, "Navigating the Stormy Waters: How the South Caucasus Water Academics Network (SWAN) Is Furthering Discussions on Water Diplomacy in the South Caucasus and Beyond," *Bliss*, June 11, 2024.
[12] Mehmet Can Toptaş and Hülya Ömür Uylaş, "DSİ bütçesinin yüzde 95'i toprak ve su kaynaklarının yönetimine ayrıldı," *Anadolu Ajansı*, October 20, 2025.
[13] Rovshan Abbasov, "State of Water Use in Azerbaijan," unpublished PowerPoint presentation, *Inaugural Workshop of South Caucasus Water Academics Network,* April 3–5, 2024.
[14] Convention on Biological Diversity, *CBD Fifth National Report – Azerbaijan (English Version)*, April 2014.
[15] Intergovernmental Panel on Climate Change, "Chapter 4: Water," in *Climate Change 2022: Impacts, Adaptation and Vulnerability* (2022).

3 million people and more than 3% of GDP.[16] In Georgia, approximately 9% of the population is exposed to a 100-year flood, and irrigated agriculture could lose up to 60% of output by 2050 due to declining river flows and limited storage capacity.[17] In Armenia, climate-related events over the past 25 years have caused losses exceeding $1.5 billion, with floods disproportionately affecting poorer households. These vulnerabilities are amplified by the country's reliance on transboundary inflows, which account for roughly 30–35% of its surface water.[18] Azerbaijan is particularly exposed as the downstream riparian, where river flooding already affects about 100,000 people annually and is projected to worsen without preventive measures.[19]

Water quality concerns exacerbate these challenges. Across much of the basin, sewage and industrial runoff remain insufficiently treated, with pollution effects accumulating downstream where wastewater infrastructure is limited. As a result, Azerbaijan—heavily dependent on the Kura and Aras for domestic supply and sanitation—faces acute exposure to deteriorating water quality.[20] A recent review of the water quality situation in the Aras confirms that industrial and agricultural effluents enter the river in Türkiye, Armenia, and Iran and no multi-lateral agreement, commission or panel for dialogue exists to mitigate these impacts.[21]

If current management trends persist flows are projected to decline further, with most riparian states expected to experience reductions of approximately 20% by 2100.[22] Without adaptation, climate projections indicate steep agricultural losses by 2051–2060, with yields of key crops expected to fall by up to 50–70%, disproportionately affecting lower-income populations.[23]

3. The governance landscape

The water security risks outlined above are compounded by fragmented regional water governance and limited cooperation among the riparian states. In the absence of a comprehensive multilateral framework, governance in the Kura–Aras Basin relies on a patchwork of bilateral arrangements, many inherited from the Soviet period. These agreements remain partial and only intermittently address water management concerns. As a result, existing mechanisms are insufficient to respond to increasing scarcity, rising demand, and intensifying climate risks. The ongoing prioritisation of national water agendas over basin-wide governance as well as economic growth over a longer-term sustainability of ecosystems further exacerbates water security risks. These broader governance shortcomings manifest in distinct water security pressures along the Kura and Aras, each of which warrants separate consideration.

3.1 The Kura River

[16] Farzad Taheripour et al., *Water in the Balance: The Economic Impacts of Climate Change and Water Scarcity in the Middle East* (Washington, DC: World Bank, 2020).
[17] World Bank Group, *Georgia – Country Climate and Development Report* (Washington, D.C., 2025), 23–26.
[18] World Bank Group, *Armenia – Country Climate and Development Report* (Washington, D.C., 2024), 21–24.
[19] World Bank Group, *Azerbaijan – Country Climate and Development Report* (Washington, D.C., 2023), 3.
[20] Farhad Mukhtarov and Douwe van der Meer, "Navigating the stormy waters: How the South Caucasus Water Academics Network (SWAN) is furthering discussions on water diplomacy in the South Caucasus and beyond," *ISS Blog – Bliss*, 11 June 2024.
[21] Jaleh Sheikholeslami, "Aras River: Four Countries, One River, Zero Accountability", *OneWater*, 14 July 2026.
[22] United Nations Environment Programme, *Caucasus Environment Outlook*, 2nd ed. (Arendal, Tbilisi and Vienna, 2024), 97-98
[23] World Bank Group, *Azerbaijan – Country Climate and Development Report* (Washington, D.C., 2023), 3.

Upstream on the Kura, cooperation between Türkiye and Georgia has been limited to ad hoc negotiations on shared water-related challenges.[24] When managing its transboundary waters, Türkiye has largely acted unilaterally in building water infrastructure, viewing water resources development within its own territory as a sovereign right. From the Turkish perspective, water from transboundary rivers should be used in an "equitably, reasonable and optimum manner" whereas water from rivers forming international borders should be shared "equally."[25] There are currently no multilateral agreements or joint projects specifically addressing the Kura as a transboundary system. The most comprehensive agreement dates back to *the 1927 USSR–Türkiye Convention on Water Use of Border Rivers and Streams* and *the 1997 Georgia–Türkiye Agreement on Cooperation in the Field of Protection of the Environment*, which focuses on improving surface and sea water conditions and exchanging data on the Chorokhi/Çoruh River.[26] In the absence of a dedicated basin-wide agreement, Türkiye is building the Kura–Çoruh Water Diversion, which would redirect water from the Caspian Sea Basin to the Black Sea Basin, potentially reducing downstream flows by 25–60% compared to the period prior to 2017 when the dams started being built.[27]

Further downstream, Georgia and Azerbaijan have a relatively developed water cooperation. A 1997 intergovernmental agreement treats the Kura and the transboundary Jandar Lake as shared economic and ecological assets, calling for joint efforts to prevent pollution, ensure sustainable water use, and restore and protect transboundary ecosystems.[28] Another layer of cooperation occurs between the two environment ministries, including a 2007 Memorandum of Understanding (MoU) intended to establish a working group for information exchange and joint monitoring of transboundary waters.[29] Despite the MoU, however, no working group had been formally established as of 2009.[30]

Over the past 15 years, third parties have sought to improve the Kura-related cooperation between Georgia and Azerbaijan, leading to the UNDP/GEF Kura I and II projects. Phase I (2011–2014) culminated in the "Strategic Action Plan for the Kura River Basin," (SAP)[31] while Phase II (2017–2021) focused on implementing the SAP, developing national Integrated Water Resources Management (IWRM) plans, and supporting bilateral agreements. The Organization for Security and Co-operation in Europe (OSCE) and United Nations Economic Commission for Europe (UNECE) facilitated six rounds of consultations on a draft agreement titled "Co-operation in the Field of Protection and Sustainable Use of the Water Resources of the Kura River Basin," which, as of 2021, remained unsigned.[32] In 2024, Azerbaijan's Ministry of Ecology and Natural Resources announced plans to sign a water data exchange agreement with

[24] Firuz Suleymanov, "The institutionalization of the Kura-Aras River Basin for effective management of water resources," *International Journal of River Basin Management* (2024), 6.
[25] Aysegül Kibaroglu, "An analysis of Turkey's water diplomacy and its evolving position vis-à-vis international water law," *Water International* 40, no. 1 (2015): 153–167.
[26] United Nations Environment Programme, *Caucasus Environment Outlook*, 104.
[27] Halil Burak Sakal, "The risks of hydro-hegemony: Türkiye's environmental policies and shared water resources in the South Caucasus," *Caucasus Survey* 10, no. 3 (2022): 294–323.
[28] Pierre Strosser, Gloria De Paoli, and Tatiana Efimova, *"The Potential Benefits of Transboundary Cooperation in Georgia and Azerbaijan: Kura River Basin,"* OECD Environment Working Papers No. 114 (Paris, 2017), 19.
[29] UNECE, *Gap Analysis_final* (citing Georgia Azerbaijan Bilateral Government Agreement (1997) art 8 on transboundary ecosystems protection and restoration) 405–406.
[30] UNECE, "Report on National Working Group Meeting for Identification of the Legal and Institutional Needs for Accession and Implementation of the UNECE Water Convention by Georgia", (2009): 4.
[31] IW:LEARN, *Project Summary: Outputs for the Components*.
[32] Lukas Rüttinger, Pia Van Ackern, and Adrian Foong, *Regional Consultation for the South Caucasus. Azerbaijan and Georgia: Co-operation opportunities for addressing the security implications of climate change* (Berlin: adelphi; Vienna: OSCE, 2021)

Georgia.[33] However, no agreement has been concluded, and transboundary water monitoring and data exchange remain absent. These unfruitful efforts indicate that water diplomacy occupies a relatively low political priority for the riparian states, which is paradoxical given the existential security threat water scarcity poses to Armenia, Azerbaijan, and Georgia.

3.2 The Aras River

Türkiye's approach to the Aras differs somewhat from that on the Kura. Whereas the Kura flows directly from Türkiye into Georgia, the Aras partly flows through Türkiye and partly forms its border with Armenia. Türkiye has pursued extensive water infrastructure on the Aras, with nine dams operational (1,468 million cubic meters, MCM), seven under construction (1,874 MCM), and a further seven planned (401 MCM). Together, these projects give Türkiye control over roughly 83% of the basin's annual flow within its territory. Key projects include the Karakurt Dam (590 MCM), completed in 2018, and the Söylemez Dam (1,400 MCM), scheduled for completion in 2028.[34] Once completed, these projects could substantially reduce downstream flows to Armenia, Iran, and Azerbaijan.[35]

Despite frosty political relations and the absence of formal diplomatic ties, Türkiye and Armenia maintain active water management cooperation on the Aras and Arpaçay/Akhuryan rivers. The two countries jointly manage the Arpaçay/Akhuryan Dam through routine meetings of a permanent joint commission and regular measurements of water quantity. This cooperation is rooted in Soviet-era arrangements, particularly the 1927 "Kars Protocol" which establishes a fifty-fifty allocation of boundary waters, regulates water infrastructure development, and provides for a joint boundary water commission.[36] These agreements, however, neither regulate water quality nor place obligations on upstream parties to restrict water use or storage. Nevertheless, the Soviet–Turkish agreement on the Arpaçay/Akhuryan Dam has provided a foundation for continued collaboration and could support for future agreements.[37]

Armenian–Iranian and Azerbaijani–Iranian cooperation is similarly rooted in the 1957 Soviet–Iranian agreement on the joint use of the frontier stretches of the Aras and Atrak rivers. The agreement established principles of equal water allocation and join development, supported by mixed expert groups and reporting mechanisms.[38] Armenia and Iran have subsequently developed problem-driven cooperation on Aras water quality, formalized through a MoU in November 2023 establishing three joint expert groups to address industrial and mineral pollution.[39]

Iranian-Azerbaijani cooperation has also produced extensive joint infrastructure. The two countries jointly operate four dam complexes, including the Aras and Mil-Mughan dams,

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[33] Aynur Bayramova, "Azerbaijan, Georgia to ink agreement on water resource data exchange for Kura river", *Report News Agency*, 28 August, 2024.
[34] Shushan Grigoryan, "Turkey's Water Politics and Its Ramifications for Riparian States," *Institute for Security Analysis* (2026), 5.
[35] Farhad Mukhtarov and Douwe van der Meer, "Navigating the stormy waters: How the South Caucasus Water Academics Network (SWAN) is furthering discussions on water diplomacy in the South Caucasus and beyond," *ISS Blog – Bliss*, 11 June 2024.
[36] Mehmet S. Altingoz, *Water Diplomacy in Post-Soviet Geographies: Analyzing Multiple Scales of Cooperative Potential* (PhD diss., University of Delaware, 2022).
[37] Rafi Gabib Oglu Mamedov, "The Water Factor: Politics of Sustainable Development", *Research Institute of Hydraulics and Land Amelioration, Baku, Azerbaijan,* 2000.
[38] *Agreement between Iran and the Union of Soviet Socialist Republics for the Joint Utilisation of the Frontier Parts of the Rivers Aras and Atrak for Irrigation and Power Generation* (Tehran, 11 August 1957).
[39] Tehran Times, "Tehran, Yerevan sign MOU to remove Aras pollution in a year," November 17, 2023.

which were developed under Soviet–Iranian agreements and have supported agricultural development on both sides of the border.[40] More recently, the Khudafarin and Giz Galasi complexes, initially agreed upon in 1977 but subsequently stalled by regional instability and the Nagorno-Karabakh conflict,[41] were revived through a 2016 Iran–Azerbaijan agreement establishing a Joint Technical Commission to coordinate their implementation and management.[42] Construction accelerated following Azerbaijan's restoration of control over the sites in 2020,[43] and the two complexes were commissioned and inaugurated in 2024. Khudafarin, with an installed capacity of around 200 MW, and Giz Galasi (80 MW) are expected to generate electricity and provide irrigation for hundreds of thousands of hectares.[44]

Overall, these projects show how shared economic interests, regional development objectives, and joint management of hydraulic infrastructures can sustain technical cooperation. Yet such arrangements remain insufficient to address the basin's wider governance challenges.

4. Governance challenges

Over the past two decades, donor-funded[45] projects have enabled Armenia, Georgia, and Azerbaijan to cooperate on water management and, on occasion, engage in trilateral initiatives. However, these efforts have yet to produce a formal regional legal or institutional framework, leaving cooperation fragmented across largely project-based arrangements. The limited involvement of Türkiye and Iran as key riparian states in third-party-funded initiatives has further constrained their basin-wide reach. As a result, existing arrangements address different parts of a shared problem without providing a framework for managing the Kura–Aras river system as a whole. Four interconnected governance challenges emerge from these gaps.

First, the basin lacks a shared knowledge base. Bilateral arrangements generate data and monitoring practices, but do not produce a coherent, basin-wide picture. Inter-operable datasets, common station metadata, harmonized indicators, and reproducible analytical methods are largely absent. Countries continue collecting data using different methods, monitoring systems are not integrated, pollution control is handled mainly at the national level until it becomes cross-border, and emergency response is still largely reactive instead of guided by shared protocols and ongoing collaboration.[46]

Second, important asymmetries persist across issue areas. Cooperation on water allocation and infrastructure is generally more developed than cooperation on water quality, ecosystems, and

[40] Ayya Lmahamad, "Azerbaijan, Iran mark anniversary of Aras, Mil-Mugan dams' operation," *AzerNews*, 2 June 2021. Ministry of Energy of the Republic of Azerbaijan, "The 50th anniversary of the joint use of the Araz and Mil-Mughan reservoirs has been celebrated | Ministry of Energy of Azerbaijan", 31.05.2021. Translated from Azerbaijani. Ahmad Ahmadzada, Aghamir Hashimov and Ahliman Verdiyev, "The History of Azerbaijan Research and Industrial Institute on Hydraulics and Land Amelioration and the Achievements of the Irrigation Science in Azerbaijan in the XX-XXI centuries", 2014. Translated from Azerbaijani.
[41] President of the Republic of Azerbaijan, "Ceremony to commission 'Khudafarin' hydroelectric complex and inaugurate 'Giz Galasi' hydroelectric complex was held with participation of Azerbaijani and Iranian Presidents," May 19, 2024.
[42] *Caucasus Watch*, "Iran and Azerbaijan continue to build power plants on Araz River," April 29, 2022.
[43] Burc Eruygur, "Azerbaijan, Iran inaugurate Giz Galasi hydroelectric complex on Aras River," *Anadolu Agency*, May 19, 2024.
[44] *Caucasus Watch*, "Iran and Azerbaijan continue to build power plants on Araz River," April 29, 2022.
[45] Donors include(d) the European Union (EU), the United States Agency for International Development (USAID), the Global Environment Facility (GEF), the United Nations Development Programme (UNDP), Swedish International Development Cooperation Agency (SIDA), Technical Assistance to the Commonwealth of Independent States (TACIS) and the OSCE.

[46] Mina Muradova, "Severe Flooding Creating New IDPs in Azerbaijan", *Eurasianet*, May 25, 2010.

emergency response. For example, Armenian–Turkish arrangements are relatively detailed on allocation and infrastructure operations but remain limited in water quality governance, pollution control, and ecological management. As a result, key elements—such as classification standards, pollutant limits, industrial discharge controls, and early-warning systems—are weakly defined and differ across riparian states, increasing downstream risk.[47]

Third, existing arrangements are poorly aligned with the basin topology. Cooperation remains largely confined to bilateral frontier segments—Armenia–Türkiye, Armenia–Iran, and Azerbaijan–Iran along the Aras, and Georgia–Azerbaijan along the Kura—while cumulative impacts across the wider system, including the Caspian Sea, fisheries, and ecosystem services, remain insufficiently addressed.[48]

Fourth, there is no sustained on-going platform for multilateral dialogue between riparian states at the technical, societal, and political levels. Such dialogue is essential for trust building and the formation of common norms and institutions, as proven by relatively successful efforts in Central Asia, the Mekong River Delta and the Nile River Basin. Third-party involvement could help sustain such efforts, provided that appropriate safeguards are in place.[49]

The governance challenges listed above exacerbate regional water security risks in three major ways. First, they increase uncertainty. As climate variability intensifies, historical baselines become less reliable for planning and operating reservoirs, irrigation systems, and municipal supply. Without interoperable monitoring and shared data standards, risk assessments remain partial, limiting anticipatory capacity and exposing downstream actors to shocks.

Second, unilateral adaptation measures can shift burdens across the basin. Under conditions of stress, states seek to secure supply through storage expansion, abstraction, operational rule changes, or new infrastructure. Without prior notification, shared baselines, or coordinated assumptions, such measures can redistribute scarcity and elevate downstream risk, reinforcing perceptions of strategic behaviour even when decisions are framed domestically as resilience.[50]

Third, water quality deterioration is likely to become an increasingly dominant risk. Lower flows reduce dilution capacity and concentrate pollutants. At the same time, extreme precipitation events increase runoff and pollutant transport, and rising temperatures exacerbate ecological stress.[51] Existing assessments, including those offered by UNDP, highlight that climate change amplifies both quantity and quality stress in interaction with land-based pollution and institutional weaknesses.[52] Without coordinated action, these dynamics risk locking the basin into a slow-moving crisis in which restoration costs escalate and political incentives for collective responsibility diminish.

5. Lessons from the Euphrates–Tigris Basin

[47] United Nations Development Programme (UNDP), "*Transboundary Diagnostic Analysis for the Kura-Aras River Basin*", January 22, 2014.
[48] Saida Rustamova, "The World's Largest Lake Is Disappearing – and It's Taking Ecosystems and Livelihoods With It," *Euronews*, May 15, 2026.
[49] Farhad Mukhtarov and Douwe van der Meer, "Navigating the stormy waters: How the South Caucasus Water Academics Network (SWAN) is furthering discussions on water diplomacy in the South Caucasus and beyond," *ISS Blog – Bliss*, 11 June 2024.
[50] Organization for Security and Co-operation in Europe Secretariat, "Climate Change and Security – South Caucasus," July 25, 2017.
[51] United Nations Environment Programme, *Caucasus Environment Outlook*
[52] United Nations Development Programme, *Climate Change in the South Caucasus* (UNDP 2011).

Shared by Türkiye, Syria, Iran, and Iraq, the Euphrates Tigris Basin (ETB) provides a useful comparison for the Kura–Aras Basin. Both basins share Türkiye as the upstream country, but they display different patterns of transboundary water governance, reflecting the ways in which large infrastructure projects, regional development plans, and sovereignty concerns interact over time. While the Kura–Aras struggles with fragmented governance and the absence of a shared basin-wide knowledge base and a platform for dialogue, the ETB is a highly politicized basin where cooperation continues mainly through provisional, technical, and issue-specific arrangements rather than a comprehensive legal framework, such as the 1987 Turkish-Syrian Economic Protocol, the 1990 Syrian-Iraqi Water Accord, and the 2024 Turkish-Iraqi Water Cooperation Framework Agreement.[53] As such, the ETB offers practical design and management lessons for the Kura–Aras that are relevant to politically sensitive and institutionally fragmented contexts. Such lessons should, however, be drawn with care as the aim here is to learn from and adapt these experiences rather than transfer arrangements uncritically or without regard to context.

First, infrastructure and regional cooperation evolve together, but governance does not need to start with a comprehensive legal framework. The ETB shows how large-scale projects can produce competing regional visions and reshape negotiation dynamics. Türkiye's extensive upstream infrastructure, particularly the massive South-eastern Anatolia Project (GAP), has influenced basin politics, reinforcing asymmetries and shaping allocation debates.[54]

Despite the absence of a basin-wide treaty, interaction has continued through flexible and often non-binding arrangements, including Joint Technical Committee meetings, Track II initiatives, and MoUs on water governance.[55] For the Kura–Aras Basin, where the main challenge is institutional fragmentation rather than infrastructure dominance, the lesson could be that basin governance does not require immediate legal consolidation. A functional and gradual approach can still manage interdependence under political constraints. However, such an approach must move beyond the currently ad-hoc and patchy modus of bilateral agreements and contacts without an overall framework of action or indeed a clear objective for such cooperation.

Second, a data-first approach is a viable entry point in contested basins. Although never implemented, Türkiye's proposed *Three-Stage Plan* recognized that joint inventories and shared methodologies are prerequisites for equitable and reasonable water and land use in the ETB.[56] Across the basin, the riparian states continued exchanging hydrological data and coordinating reservoir operations even during tense periods, helping to stabilise expectations and reduce uncertainty. Recent research on hydro-transparency in the basin, however, suggests that such practices do not necessarily reflect cooperative norms as riparian states engage in selective disclosure and concealment of water data according to geopolitical interests.[57] While desecuritisation tends to be associated with greater state disclosure and data sharing, there is little evidence of concerted reductions in hydro-transparency during periods of heightened

[53] Amir Safaee, Arda Bilgen, and Saeed Morid, "Conflictual Cooperation in Transboundary Waters: Insights from the Euphrates–Tigris Basin," *Water International 51*, no. 6 (2026): 741–764.
[54] Arda Bilgen, "The Southeastern Anatolia Project (GAP) Revisited: The Evolution of GAP over Forty Years," New Perspectives on Turkey 58 (2018): 125–154.
[55] Amir Safaee, Arda Bilgen, and Saeed Morid, "Conflictual Cooperation in Transboundary Waters: Insights from the Euphrates–Tigris Basin," Water International 51, no. 6 (2026): 741–764.
[56] Dogan Altinbilek, "Development and Management of the Euphrates–Tigris Basin," *International Journal of Water Resources Development* 20, no. 1 (2004): 15–33.
[57] Arda Bilgen and Michael Mason, "Hydro-Transparency and Transboundary Water Governance: Addressing Information Deficits and Asymmetries in the Euphrates-Tigris Basin," Environmental Science & Policy 180 (June 2026).

water securitization.[58] In the Kura–Aras, co-produced datasets, interoperable monitoring stations, and harmonized indicators could provide the cooperation mechanisms currently missing. Although such mechanisms do not resolve allocation questions, they help create the analytical foundation needed to address them more rationally.

Third, upstream–downstream asymmetries shape outcomes, but they do not eliminate cooperation. In the ETB, Türkiye's geographic position and asymmetrical hydraulic capacity give it considerable influence over basin flows and enable it to maintain information advantages regardless of shifts in the intensity of water securitization. Downstream states therefore prioritize allocation security and environmental protection, while the upstream state emphasizes sovereignty and cross-sectoral integration. This divergence helps explain why comprehensive agreements remain difficult to achieve.

By contrast, although Türkiye remains the basin's dominant hydraulic actor,[59] the Kura–Aras faces a more fragmented governance landscape, with its main constraints stemming from political mistrust and fragmented bilateral relations rather than from Turkish water abstractions alone. Indeed, the basin's challenges reflect fragmented and increasingly resource-intensive approaches to water and land management across the riparian states. The comparison suggests that while hydropolitical asymmetry can complicate basin governance, fragmentation and the absence of a shared knowledge base can be equally limiting. In both basins, technical cooperation serves as a lowest common denominator.

Fourth, issue-linkage can both politicize and enable cooperation. As a popular strategy for addressing transboundary water issues, issue-linkage involves exchanging concessions in areas of relative strength by linking otherwise distinct issue areas.[60] In the ETB, water diplomacy increasingly intersects with trade, energy, security, and infrastructure finance. Such linkages raise the political stakes of negotiations, but they also embed water cooperation within broader patterns of interdependence that can incentivize compromise. The implication for the Kura–Aras is not to isolate water from other sectors entirely, but to design cooperation so that technical routines—such as monitoring, data exchange, early warning—are insulated from day-to-day political volatility, even if they coexist with parallel economic and security dialogues.

Finally, the coexistence of conflict and cooperation should be treated as the baseline. Despite periodic breaks in cooperation, the ETB shows that sustained interaction can continue without a comprehensive treaty and despite recurring tensions. In divided regions, basin governance often develops incrementally through verifiable joint workstreams. Cooperation can then spill over into other areas, gradually moving from technical issues to include more political ones.

The ETB has thus sustained a provisional regime characterized by memoranda of understanding, technical committees, data exchange, and issue-linkage across sectors despite persistent disputes and the absence of a permanent basin-wide allocation treaty. Surface water allocation remains contested, and climate change intensifies scarcity risks. Yet the basin has

[58] Ibid.
[59] Zeitoun, Mark, and Jeroen Warner. "Hydro-hegemony–a framework for analysis of trans-boundary water conflicts." *Water policy* 8, no. 5 (2006): 435-460.
[60] Ines Dombrowsky, "The Role of Intra-Water Sector Issue Linkage in the Resolution of Transboundary Water Conflicts," *Water International* 35, no. 2 (2010): 132–149.

avoided "water wars,"[61] demonstrating that cooperation can endure even in highly securitized contexts, provided it is anchored in practical routines rather than maximalist legal integration.

6. Towards more coordinated basin governance

The Kura–Aras Basin requires a basin-scale approach to water governance, with riparian states revisiting their water management paradigms to better balance the economic, social, environmental, and cultural values of water alongside related concerns, including soil quality, biodiversity, and energy.[62] Such a transition is essential as water-related risks accumulate and propagate across borders, increasing the risk of irreversible changes associated with regional water bankruptcy. However, political tensions and realities in the region make a comprehensive multilateral treaty unlikely in the near term. This does not preclude progress towards more sustainable and equitable basin management. Rather, riparian states and third-party actors can pursue pragmatic policy measures that strengthen cooperation, improve coordination, and gradually build the foundations for more integrated basin-wide governance.

6.1 Prioritize bilateral and multilateral discussions on data and monitoring methodologies, standards, and protocols. While data sharing and joint monitoring are important for transboundary water cooperation, they need to be preceded by the standardization of measurement and analytical methodologies and frameworks. Without harmonized protocols, shared data may generate divergent interpretations and undermine the trust and cooperation they are intended to foster. At the same time, efforts to strengthen hydro-transparency should not be treated as purely technical or politically neutral initiatives. They need to account for underlying political dynamics and power asymmetries, as greater disclosure can otherwise reproduce existing upstream–downstream inequalities. This suggests complementing standardized data and monitoring arrangements with institutional safeguards, such as joint monitoring systems and third-party verification, as well as broader incentives, including issue linkages and benefit-sharing arrangements, to ensure that greater transparency contributes to more equitable governance of shared waters.[63]

6.2 Institutionalize technical routines. Regular technical interaction builds trust and ensures continuity. Riparian states should commit to routine publication of seasonal flow and water-quality bulletins, coordinated reservoir operations, and agreed incident-response procedures. Establishing permanent technical committees or high-level cooperation councils keep communication channels open and ensure continuity even during high political volatility.

6.3 Foster basin-wide coordination and link incentives. Once foundational data and routines are in place, move from fragmented bilateral engagement toward structured multilateral

[61] Peter H. Gleick, "Water, War & Peace in the Middle East: 30 Years On," *Environment: Science and Policy for Sustainable Development* 66, no. 5 (2024): 7–10.
[62] Shahana Bilalova, Jens Newig, and Sergio Villamayor-Tomas, "Toward Sustainable Water Governance? Taking Stock of Paradigms, Practices, and Sustainability Outcomes," *WIREs Water 12*, no. 1 (January/February 2025).
[63] Arda Bilgen and Michael Mason, "Hydro-Transparency and Transboundary Water Governance: Addressing Information Deficits and Asymmetries in the Euphrates-Tigris Basin," *Environmental Science & Policy* 180 (June 2026).

technical meetings. Start with narrow, actionable tasks such as monitoring, forecasting, and emergency response, and expand over time into broader coordination.

6.4 Support multi-track water diplomacy initiatives. Informal and semi-formal platforms for dialogue, joint research, and professional exchanges among scientists, water agencies, and civil society can sustain cooperation when formal diplomacy is limited. Just as the *Blue Peace Initiative* seeks to close knowledge gaps, build trust, and maintain interaction during periods of high tension in the Middle East and beyond,[64] similar approaches can strengthen capacity and continuity in the Kura–Aras Basin. Whereas civil society dialogues between Armenia and Azerbaijan have taken place in recent years, participation has generally been confined to a small circle of actors.[65] Expanding dialogue to include water practitioners from both Armenia and Azerbaijan and other basin countries could provide a practical and non-political platform to build trust, share knowledge, and strengthen transboundary cooperation. Third parties support to soft governance measures, trust building, and science and water diplomacy can have a measurable impact in this area.[66]

6.5 Strengthen the science-policy interface. Weak interaction between scientific and policy communities, both within and across riparian states, undermines data availability, encourages information distortion, and limits the extent to which scientific knowledge informs transboundary water governance. To address this, scientific communities should have a stronger voice in policymaking, and their inputs should be systematically integrated to ensure both rigor and inclusivity. Newly established bottom-up initiatives, such as the South Caucasus Water Academics Network (SWAN), should be supported alongside top-down policy and decision-making structures to democratize transboundary water governance in the basin.[67]

6.6 Enable regular exchanges on effective water management practices. Such exchanges could not only be about transboundary cooperation but also about water use, efficiency, and treatment within each riparian. Azerbaijan, for instance, is making significant investments in irrigation and urban water infrastructure and practices. Reviewing these and learning from these investments can benefit water use practices across the basin. Such reviews and exchanges on practices can become another focus area for the science-policy interface.

6.7 Digital Twins for science-policy action research. Developing a digital twin (a virtual analogue) of the Kura-Aras Basin, or its sub-basins, would allow scientists and researchers to analyse interconnections between water quantity and quality, land use, energy, and other system components and help policy makers make informed decisions. While too ambitious as a starting point for cooperation, developing a Digital Twin could serve as a boundary object

[64] Blue Peace Middle East, "Blue Peace Middle East."
[65] Arzu Geybullayeva, "Armenia and Azerbaijan, dialogue or performance?", *Osservatorio Balcani e Caucaso Transeuropa*, 1 December 2025.
[66] Farhad Mukhtarov, "Trust comes on foot and leaves on horseback," *International Institute of Social Studies*, 8 May 2025.
[67] Farhad Mukhtarov and Douwe van der Meer, "Navigating the stormy waters: How the South Caucasus Water Academics Network (SWAN) is furthering discussions on water diplomacy in the South Caucasus and beyond," *ISS Blog – Bliss*, 11 June 2024.

for maintaining ongoing cooperation, helping build interpersonal trust as well as diplomatic skills.