

Unraveling Azerbaijan's Water Crisis

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Azerbaijan is classified as the eighteenth most water-stressed country in the world and sixty-first in terms of being in danger of experiencing severe natural disasters. It is thus a country affected by the global water crisis. Water scarcity is becoming a growing threat to its sustainable future, due to the negative impacts of climate change as well as several other factors, including the fact that around 70 percent of the water used in Azerbaijan originates in other countries.

This analytic policy paper examines the current state of Azerbaijan's water-related problems by surveying its fundamental causes, raising awareness about its broad future effects, and outlining potential policy options to mitigate risks and lessen their severity.

The main issues facing the country's water governance system include:

- An excessive use of water supply by the agricultural sector, which is characterized by unsustainable irrigation practices.
- Poor collaboration between state agencies and an unclear division of responsibility.
- Environmental degradation, which is resulting in decreased rainfall and increased droughts.
- A lack of transborder cooperation and other anthropogenic sources.

Enabling transborder collaboration, enhancing the regulatory environment, participating in virtual water commerce, implementing contemporary methods to combat water pollution, and developing climate-adaptive solutions are presented as keys to direct future action on this issue.

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The Biggest Problem?

Although Azerbaijan is the largest and most populous country in the South Caucasus, it accounts for only 10 percent of the region's total water resources. The rivers Kura and Araz are the country's main water sources, accounting for 80 percent of overall water usage. In 2017, scientist Mehman Rzayev published findings indicating that there was a risk of the Kura not reaching the Caspian Sea by 2050. However, almost 30 years before the forecasted date, this risk is already becoming reality. In 2020, the river's level had dropped so much in some parts that instead of the Kura flowing into the Caspian Sea, the salty seawater had started flowing into the river.

The foregoing illustrates the perils of a business-as-usual approach to water resource management: it will almost certainly ensure that Azerbaijan's water-stress will further increase in the time to come, resulting in a plethora of political as well as socio-economic challenges. As one ADA University faculty member has put it, "in only ten years, the water crisis could become the biggest problem facing the country."

Access to safe drinking water and sanitation is considered a fundamental human right, according to various international instruments to which Azerbaijan is a party as well as the country's Constitution. The shrinking of water resources results in complex problems that influence all stages of a given society. It is sufficient to mention five of the most representative here:

First, the absence of safe drinking water and sanitation services leads to serious health consequences.

Second, water plays a vital role in Azerbaijan's national economy. The agricultural sector alone provides employment to 38 percent of the population, while water plays a critical role in meeting 89 percent of the total economic needs of the country.

Third, as socio-economic development leads to higher water demand in different sectors, many of these will face difficulties in their operations, resulting in food and electricity shortages, a rise in unemployment, and income insecurity. It is estimated that over 67 percent of the irrigation demands in some regions of Azerbaijan will not be met by 2040.

Fourth, water shortages throughout the country will deepen social inequality by turning water into a commodity that marginalized groups will not be able to afford.

Fifth, the scarcity of water resources will also modify the demographics of the country, leaving many villages empty. If the situation persists, more than 200,000 people in Neftchala and Salyan districts are likely to be forced to relocate in the coming years.

The conclusion writes itself: the problems underlying the water crisis are multidimensional and pose great challenges to the country's future.

The Complexity of the Regulatory Framework

The complexity of the overall regulatory framework in the country is one of the main obstacles to effective water resource management. Simply put, this suboptimal state of affairs unnecessarily complicates any attempt at effective policy coordination.

Despite valiant efforts in previous years, the overall system remains outdated and is characterized by its inefficiency. We can provide just a few examples.

- The governance of water-related sectors like agriculture and energy are separated from each other, which prevents a centralized approach when responding to water-related problems.
- Because water resources are improperly managed, up to half of the Kura's water is lost within the canals before reaching its final destination.
- Although groundwater and surface water resources are interconnected, the fact that the management of each is regulated by different entities results in inconsistencies during the course of action and leads to disjointed policy action plans.
- Policymakers disregard the initiatives of local grassroots organizations and expect communities to adapt to technical solutions that do not take into account their traditional practices.

Anthropogenic Drivers of Water Scarcity

Most of Azerbaijan's water is used in agriculture for irrigation, amounting to approximately 70 percent of total usage, followed by industry (24.3 percent), households (3.2 percent), and other (0.7 percent) purposes.

One of the main reasons for water scarcity in Azerbaijan stems from unsustainable irrigation practices in agriculture. Under-maintained canals built during the Soviet era, lack of investment in modern technology and infrastructure, and the bureaucratic nature of local governments all serve as obstacles to improving the irrigation system. According to results of a survey on agricultural water supply, almost 75 percent of agriculture and irrigation throughout the country had either challenging or poor water supply.

As surface temperatures continue to increase (due to global warming), the situation is only expected to worsen in the future. Considering that the primary water sources of the Kura and Aras rivers originate from rainfall, melting snow, and glaciers in the mountains, an increase in the intensity of precipitation resulting in more intense floods and a decrease in snow are expected to cause water scarcity in rivers and aquifers.

In fact, throughout the last decade, the amount of rainfall in the country has decreased by 30 percent. Projections forecast that by the year 2100, water resources will decline by 25 percent compared to the year 2000. The presence of hydrological infrastructure such as dams and reservoirs on Azerbaijan's rivers cause disruptions in their natural flows, further escalating seawater intrusion and resulting in habitat homogenization. To prevent further harm to their crop fields, many villagers are forced to buy water every two to three days at their own expense, while many people lack access to water due to financial constraints.

Poor Quality of Water Resources

Sources of pollution of rivers and groundwaters in Azerbaijan include:

- Discharge of waste originated in manufacturing.
- Runoff from the massive use of fertilizers and pesticides in the agriculture sector.
- Leakage of oil and other chemical substances.

All these pose serious challenges to the country's water quality. Furthermore, the pollution of water bodies in Azerbaijan, especially the Kura River, by individuals is one of the unpleasant realities of the current day. The most widespread form of pollution by people is the littering of riverbanks with plastic.

The fact that there are no waste management facilities in most of Azerbaijan's regions leads to landfill discharges polluting the rivers.

Transborder Challenges

It is both obvious and underappreciated that water recognizes neither political borders nor administrative boundaries. While local pollution is a problem that internally disrupts the quality of water resources, the external challenges stemming from transborder rivers affect not only Azerbaijani citizens, but also the lives of people in neighboring countries.

There are two main aspects regarding these challenges: one has to do with the quality and quantity of water; the other is related to the lack of internal and shared management over water resources. Consider in this context that 65 percent of the Kura-Aras basin is located in the South Caucasus, while the rest is split between Iran and Türkiye. Azerbaijan is downstream of the sources of both rivers, which makes it inevitable that all the repercussions of upstream water extraction and contamination pass into Azerbaijan.

The main obstacle to the shared management of transborder water resources revolves around the lack of an inclusive regional arrangement due to existing political tensions between the states that share the Kura-Aras basin. The conflict between Armenia and

Azerbaijan is a case in point. Thus, Azerbaijan’s bilateral contracts on the water issue with some of its neighbors has only led to a partial solution to the problem. There remains a wide gap in transnational cooperation within the region.

The example of the Convention on the Legal Status of the Caspian Sea is useful to keep in mind in this regard. And at least two out-of-region examples can also be mined for best practices that could be applicable to the South Caucasus.

The first is the *Agreement on the Nile River Basin Cooperative Framework bringing together its 11 riparian countries and establishing the Nile River Basin Commission*, which “serves as the institutional framework for cooperation among Nile Basin States in the use, development, protection, conservation and management of the Nile River Basin and its waters.” The state parties to the Agreement carry a legal obligation not to cause damage to the Nile’s ecosystem and to ensure the equitable protection and preservation of the river basin. Along similar lines, coordinated transnational action for the management of water resources of the Kura and Aras Rivers could prevent further harm to downstream countries and allow each user to benefit from the river basins equitably.

The case of the Great Lakes Water Quality Agreement, involving Canada and the U.S., is a second such example. The agreement focuses on issues like lake management, pollution control, ecosystem maintenance, and climate change impacts. Its success stems from extensive monitoring, periodic meetings of government officials, and the joint vision and expectations of the state parties. Also of relevance is that one of the Agreement’s provisions called for the removal of several dams and road crossings, which resulted in an increase in fish species in the waters falling under its jurisdiction. The relevance of this policy approach for the riparian states of the South Caucasus region can be related to the presence of a large number of dams on the Kura and Aras rivers, whose presence worsens the problem of water shortage in downstream countries—particularly Azerbaijan. The adoption of a similar integrated approach to transborder water management could discourage the construction of the dams by countries such as Türkiye and Georgia and improve the experience of all neighboring states.

Improving the Regulatory Framework

As discussed above, one of the core problems underlying the water crisis is the inadequacy of the current water resource management system, which is both too complex and uncoordinated. In order to solve this problem and maintain a sustainable regulatory framework, effective coordination must be assured between government agencies and other stakeholders.

International best practice in this regard is known as integrated water resources management (IWRM), which is defined by the UN Environment Programme as a “process

that promotes the coordinated development and management of water, land and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.”

One of the main factors of this model is the involvement of water users and interest groups in the management and formation of water policy. In Azerbaijan’s case, these would be farmers, civil society groups or NGOs, and the private sector. This can include public consultations and discussions before building dams on rivers, or the inclusion of farmers in the formation of irrigation reforms.

In Azerbaijan, special attention should also be given to waste management to address the negative consequences of unregulated landfills on the quality of water resources. IWRM principles could also be applied to the regional context (see below).

Since the main source of water usage is agriculture, Azerbaijan should prepare an emergency policy for using water. One of the best examples of policies from the agricultural perspective can be taken from Spain. Madrid implemented emergency policies as part of its national plan on agricultural water usage, which had three objectives: rationalizing the consumption of water through technological advancement; improving the landscape from social and environmental perspectives; and increasing productivity.

Virtual Water Trading

The “virtual water” concept was conceived in 1993 by John Anthony Allan, a British geographer and an emeritus professor at King’s College London, who argued that water should be seen as liquid capital. The basic premise is that virtual water is traded every time goods and services are exchanged. In other words, virtual water is the hidden flow of water in food or other commodities that are traded from one place to another.

On the basis of such reasoning, Allan was able to explain how a society can endure even if it does not have enough water resources to supply its population’s foundational water-related demands. His argument, in a nutshell, is that such societies can survive by adopting a strategy whereby they buy water-intensive crops and products from foreign sources. The resulting “savings” in indigenous water usage can thus be used for another purpose.

For countries where water-related issues pose risks to the future security of resources such as Azerbaijan, this policy could be among the solutions. In fact, various countries around the world have already been using this policy, including China, various Middle Eastern states, Mexico, and countries abetting the Mediterranean.

There are several prerequisites to the implementation by Azerbaijan of virtual water trading. First, the country would need to identify the water footprint of products and

the main areas where the policy could be implemented to ease the burden of water shortages. The products that require a great amount of water could be imported from other countries, and the focus could be given to growing crops and producing goods that are not as water-intensive.

For instance, cotton is a crop that demands a substantial amount of water yet does not produce enough significant economic benefits for the country. Instead, cotton and similar water-intensive crops could be imported from other countries, and the water saved could be put to more efficient use. Moreover, since the changing climate of the country makes it suitable to grow more tropical and subtropical crops, these could be chosen as substitutes.

Forming Climate Adaptive Solutions

Another important challenge of the water crisis in Azerbaijan is related to the pitfalls of climate change. These could be addressed through the embrace of relevant climate adaptive solutions.

The central problem associated with climate change is obvious and straightforward: insufficient water supply to meet the needs of people and the environment.

Thus, to prevent climate-induced water shortages, it is essential to take action to improve the quality and quantity of water as well as to minimize the effects of climate change in the long run. For instance, one way to tackle the water shortage issue involves investing in modern water storage facilities such as rain harvesting systems. The rain harvesting method (RWH) is simple and straightforward: collecting rainwater during heavy rain periods and storing it for later usage. Countries like Cambodia, Haiti, China, Thailand, India, and Brazil all use RWH to meet the needs of their populations during drought seasons or period of water shortage.

Another relevant policy option is the provision of drought insurance to farmers, which can mitigate the harmful impact of drought seasons on people involved in the agriculture sector. While referring to the world practice, El Niño and R4 insurances in Ethiopia can be considered notable examples. After the El Niño droughts in 2015 and 2016, almost 30,000 insured farmers and their families received a financial payout to cover their costs and expenses.

Recall the above discussion concerning farmers from the Neftchala region, who could not afford to purchase tons of water on their own account during water shortages. From this perspective, the provision of drought insurance to at-risk households could help them to sustain their livelihood until the climate problem is mitigated.

Applying Modern Practices to Combat Water Pollution

Much can also be done through targeted education and information campaigns. Demonstration projects, technical assistance, newsletters, seminars, and field days for farmers should be considered.

For example, since volunteering is widespread in Azerbaijan, the government could institute a policy on volunteering to raise awareness about water pollution. Voluntary programs are appreciated due to their low cost and low staff time commitment and are often the first choice of the government.

Consider also the example of California, where an input tax policy has been put in place to incentivize the prevention of water pollution: a fee is levied on a farm input like irrigated water, chemical fertilizers, or pesticides. This can be managed on an individual basis or across all polluters. Within this policy, regulators pay farmers a targeted subsidy when pollution drops below a certain level and penalize them if effluent or irrigation water exceeds some planned number.

Something similar could be implemented in Azerbaijan.

Recommendations

This analytic policy brief recommends five policies that relate both to internal and foreign realms of the state:

- *Apply integrated water resources management (IWRM) principles.* This comprehensive approach would require wholesale legal and administrative reform as well as a transformative shift in mindset. It would greatly improve Azerbaijan's hydrological security.
- *Substitute manual irrigation with drip irrigation wherever possible and sprinkler irrigation when necessary.* Timed and precise dosage of water in agriculture would greatly decrease the environmental impact of the sector of the economy that consumes approximately 70 percent of the country's water.
- *Study the feasibility of adopting virtual water trading principles.* No harm can come from making an assessment about which goods, services, and commodities make excessive use of Azerbaijan's water resources. On this basis, an informed decision about the political and economic costs and benefits about limiting or banning their production could be made.
- *Embrace the rain harvesting method (RHM).* A modern, scientific approach to an old-fashioned method would sustainably diversify the sources of water in

Azerbaijan. Rain collection facilities could be built in the southern parts where it rains abundantly. A system of pipes would be laid to connect this infrastructure to the country's water distribution system.

- *Undertake political, diplomatic, and lobbying efforts to establish an institutional basis for regional cooperation on transborder water issues.* As a regional leader and the riparian country of the Kura-Aras basin most affected by the actions of upstream countries, Azerbaijan has a particularly prominent interest in initiating exploratory talks on a multilateral instrument to regulate the fair use of these water resources.