

WATER, ENERGY AND ENVIRONMENT IN EURASIA

Edited by
Oktay F. Tanrısever
Halil Burak Sakal



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Chapter 4

Water and Energy Security in the Case of Armenia

Mehmet Çağatay Güler

Introduction

Water security is defined as “the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability” (UN-Water, 2013). It covers multiple subjects, varying from agriculture, the environment, health, economics, political science, energy, etc., and has been regarded as the most significant topic for a country, as without it, its existence and survival cannot be maintained. In this subject, the main factors that determine water security are the available water resources and accessibility to clean water. The total water resources available in the world are estimated at 45,500 km³ / year (Oki & Kanae, 2006), although only 2.5 percent is accounted for by clean water resources, among which only a small percentage is accessible, with the remainder being locked in glaciers and in groundwater storage (Shiklomanov, 1993, pp. 13-15).

The major determinants of clean water resources are the rate of precipitation and rivers. Globally, 263 rivers and lakes are transboundary (half the Earth's surface), shared by 145 countries (UN-Water, n.d.). Such conditions endanger the water security of states and their perception of security, and there are numerous examples of cases where states are in conflict with states with

which they share clean water resources. There are conflicts and unidentified rights claims between the upper and lower part of the stakeholders (riparian states) eg. Uzbekistan-Kyrgyzstan, Sudan, Egypt and other riparian countries, Mexico and United States, etc. and these are often regarded as threats to survival, since they have the potential to affect not only the issue of water itself but also energy security, health, food security, etc. Hence, countries ascribe crucial importance to water security, contributing to the importance of hydro-geopolitics as the field that deals specifically with this subject.

The hydro-geopolitical situation in Eurasia resembles the geopolitical situation in Eurasia, but is a more specific topic that puts hydro-politics at the center of analyses. Hydro-geopolitics focuses on water resources, water conflicts and their effects on the geopolitical situation. After the collapse of the Soviet Union, the separation of water resources emerged as a serious problem in the Eurasian geography. During the Soviet era, the agreements and management systems under the Union ensured its harmonious functioning. In the post-Soviet era, however, the share of these resources has emerged as an unsolvable problem, like many other problems, as most of the resources satisfying water demand in the region turned into transboundary rivers (Guler, 2018, pp. 54-60). This gave birth to the need for effective and solution-oriented hydro-politics. Since these countries have failed to achieve cooperation in the water politics area, the need for a concrete pathway has become more crucial. To be more specific, the Southern Caucasus contains eight main rivers (Ubilava, n.d.). Almost 40 percent of the total regional territory is located on transboundary river basins. Given the lack of applicable laws related to this issue and the fact that countries are trying to maximize their shares, resolving the problem has become impossible. The issue of water security in these cases thus becomes directly related to a political problem.

Regarding the Armenian case, conflictual circumstances born out of its transboundary water status, are frequently

seen. There are two main rivers in the region, the Araks and the Kura, whose tributaries account for all of Armenia's renewable water resources (FAO, 2016). While three-quarters of the country is located in the Araks Basin, the remainder falls within the Kura Basin (FAO, 2016). The Kura River is shared by five countries, two of which, Armenia and Azerbaijan, are in a long-standing direct conflict, while Armenia also has historical hostilities with Turkey (FAO, 2009, p. 1). Similar to the Kura River, the Araks River is shared by four countries, and the same duo, Azerbaijan and Turkey, are again among those countries. Only around 16 percent of the basin created by these rivers is located within Armenia's borders, although it covers all parts of the country (FAO, 2016). Since its water demands are dependent on the outflow from these transboundary rivers, its existence and critical sectors are vulnerable and prone to external effects. Transboundary rivers should not necessarily be accepted as a source of conflict however, in the Armenian case the dispute over Nagorno-Karabakh is directly related to water security, and the conflict has been created over the sharing of resources. Additionally, Armenia's hostile relationship with Turkey makes the situation even less manageable, so as the probability of achieving a common regime that lays out the utilization conditions of the shared water resources.

The other significant issue that should be mentioned is Armenia's reliance on hydropower. Hydropower, or hydroelectricity, is relied upon to satisfy over one-third of Armenia's total electricity demand (IAEA, 2019). Natural gas-based thermal power plants satisfy another 1/3, although the country has no natural gas or oil reserves, and this absence of fossil fuels gives it no choice but to rely on imports, mainly from Russia and Iran. The remainder of the electricity demand is generated by nuclear power plants, for which fuel is imported from Russia. Overall, only 30–35 percent of the total energy demand is satisfied from domestic resources, and almost all is from hydroelectric power plants. In short, without the current water flow and precipitation, the Armenian energy sector would be 100

percent dependent on foreign fuel, making it much more vulnerable to external effects. Besides being domestic resources, energy demand in the country is dependent on hydropower, and so the importance of water increases exponentially.

In short, transboundary rivers, water conflicts and the importance of water security for Armenia occupy a pivotal role in both its domestic and foreign policies. These policies are usually related to such crucial sectors as energy, agriculture, industry and healthcare, all of which have a parallel relationship with water security. In the Armenian case, however, the link between energy and water security is more prominent and distinctive. Hence, water security and energy security will be scrutinized in separate chapters, while others will be investigated as intertwined.

Water security in Armenia

At the outset, let's briefly clarify Armenia's clean water resources. The country receives approximately 592 mm of precipitation per year, or in other words, 18 billion m³ of annual rainfall (FAO, 2016), of which 11 billion m³ is lost to evaporation (FAO, 2016). Its total renewable water resources amount to around 7.7 billion m³/year (FAO, 2016), although 1.4 billion m³ is the overlap between the renewable surface water (3.9 billion m³) and the renewable groundwater (4.3 billion m³), meaning that its annual internal renewable water resources actually amount to 6.8 billion m³ (FAO, 2016), which is equal to the annual flow of the Kura and Araks River Basins. There are 14 major sub-basins created through these two main river basins (See Table 1). The number of rivers within these basins exceeds 10,000, although many are small and short. Almost 3/4 of Armenia's territory lies within transboundary river basins.

The majority of dams in the country are left over from the Soviet era. The stored water is mostly utilized for irrigation and hydropower, and occasionally for fisheries. More than 80 reservoirs are operating in the country with a capacity of more than 1 billion m³ (FAO 2016). The largest of these is on the

Arpacay River, which forms the border with Turkey, and has a joint storage capacity with Turkey of more than 500 million m³ and provides water for the irrigation of around 30,000 ha in Armenia. The rest are small reservoirs (FAO, 2016).

Table 1. River basins in Armenia

River Basin	Area (km ²)	Precipitation (million m ² per year)	Evaporation (million m ² per year)	Flow (million m ² per year)	Flow Volume Module (million m ² per km ²)	Reservoirs (2004, in operation)
Debet - within Armenia	3895	2726	1457	1203	0.309	1
Aghstay - within Armenia	2480	1569	979	445	0.205	5
Small tributaries of Kura - within Armenia	810	510	354	199	0.106	4
Akhuryan - within Armenia	2784	1653	972	392	0.140	8
Kasakh	1480	979	486	329	0.222	6
Metsamor, without Kasakh	2240	N/A	N/A	711	0.317	25
Hrazdan	2565	1572	876	733	0.286	7
Lake Sevan Basin	4750	N/A	N/A	265	0.056	4
Azat	952	607	306	232	0.244	2
Vedi	998	573	340	110	0.111	1
Arpa - within Armenia	2306	1643	768	764	0.331	11
Vorotan - within Armenia	2476	1828	811	725	0.293	7
Voghji - within Armenia	1341	1097	448	502	0.374	2
Meghri	664	470	241	166	0.250	-

Source: FAO, 2016.

According to Falkenmark indicator, which is accepted by the United Nations for the assessment of the clean water situation in certain countries or regions, if the annual water supply is higher than 1,700 m³ per capita, then the country is categorized as water-abundant (Falkenmark et al., 1998). Any country with amounts below the 1,700 m³ per capita threshold is considered water-scarce, and there are several degrees of water scarcity depending on the population and the amount of the water drops per capita (Falkenmark et al., 1998). The water availability in Armenia for its population of 2.9 million is enough for the classification of Armenia as a water-rich country. This richness, however, is a relative concept, as two significant factors make water supply a dependent variable, being the share-based water resources and natural disasters.

Share-based water resources, in other words, transboundary rivers, play a pivotal role in defining a country's water security. In recent history we have witnessed dozens of water-related conflicts related to transboundary issues that could be addressed through proper/recognized regulatory regimes. The disagreements over the Euphrates and Tigris Rivers involving Turkey-Iraq-Syria, the dispute over the Syr Darya river between Uzbekistan and Kyrgyzstan, and Kazakhstan and Uzbekistan (Guler, 2018, pp. 60-63), the clashes over the Nile Basin among Sudan, Egypt and other riparian countries, and the transboundary water issues between Mexico and the United States are all examples of such conflicts (Swain, 2004, pp. 34-35).

The distribution of the water potential of the transboundary Araks and Kura Rivers is not yet subject to legal regulation among the five interested parties, being Turkey, Azerbaijan, Iran, Georgia and Armenia. The lack of any multilateral agreement on what drives the quantity and quality of sub-basin water still prevents consensus from being reached on the benefits of improved and collaborative water management at a

regional level. Prior to the dissolution of the Soviet Union, bilateral agreements existed between Turkey and the Soviet Union (ECC, n.d.), and between Iran and the Soviet Union over the use of the Araks River (FAO, 2009, p. 5). However, since Georgia, Azerbaijan and Armenia gained their independence, there is nothing left but disorganization. Despite the passing of many years since the dissolution of the Soviet Union, there is still no control or management mechanism governing the quantity and quality of the water.

The Water Code was adopted by Armenia in 1992 (updated in 2002), and Azerbaijan and Georgia in 1997 (FAO, 2009, pp. 5-6). In 1998, an environmental protection agreement was signed between Azerbaijan and Georgia, and a year later Georgia signed the same agreement with Armenia (FAO, 2009, pp. 5-6), envisaging cooperation in the specific protection of transboundary ecosystems. In 1999, Armenia developed an integrated water resources management plan that was funded by the World Bank (FAO, 2009, pp. 5-6), being a reform plan regarding the usage of water resources to maintain projection and development. In 2002, Armenia established a Transboundary Water Resources Commission to ensure the protection of its rights and to resolve any problems with the neighboring countries (FAO, 2009, pp. 5-6), and while several cooperation agreements were signed and monitoring issues were addressed, no concrete steps were taken toward the establishment of a multilateral binding regime.

In the post-Soviet era, in the absence of any mutual agreements, several water-based conflicts have broken out that have deeply affected Armenia's water security, and the disharmony between Armenia and Azerbaijan is directly related to the transboundary status of the Araks and Kura Rivers (GPE, n.d.; Shikhali & Safarova, 2016). The Nagorno-Karabakh region, which was under Armenian occupation, has significant water

resources over which both countries claim sovereign rights. For years, as a downstream country, however, Azerbaijan had been negatively affected by Armenia's unilateral actions in this regard. Since this region is regarded as Azerbaijan's territory by the international community and law, the utilization of water resources under or over the soil is under Azerbaijani jurisdiction. Nevertheless, due to its previous de-facto status, the water resources were also under Armenian occupation. On the other side, Armenia claims rights over the region and the water resources attached to it, which are considered to be some of the cleanest and high-quality water resources in the region (GPF, n.d.). The tension and hot clashes between Azerbaijan and Armenia threaten the water structures. E.g. following the border clashes involving the two countries in 2014, Armenians intended to target the dams through the military build-up along the border. The Sarsang Reservoir, within the boundaries of Karabakh, used to provide drinking and irrigation water not only to 17 mountainous regions, but also to six surrounding regions until it was occupied by Armenian and separatist forces (Shikhali & Safarova, 2016). Among these is the mostly Azerbaijani region of Tartar, a land of rolling hills which was situated on the line of contact between Azerbaijani and Armenian forces (Shikhali & Safarova, 2016). Sarsang Reservoir has a capacity of 560 million m³, and was under Armenian control, and the residents of Azerbaijani towns that depend on water from the Tartar River and the Sarsang Reservoir abandoned their homes as their farming and stockbreeding activities, and their residence becomes impossible in the absence of water (Shikhali & Safarova, 2016). These varied humanitarian problems are clear evidence of the importance of water security, and its use as a political tool. Though Armenians was once holding the winning hand, not only the transboundary status but also the disputes over sovereignty rights among the

two countries, place the significant water resources at high risk. As such, following the second Karabakh War, the water reservoirs under de-facto Armenian control liberated by Azerbaijan, and the winds have changed. At the current stage, Azerbaijan liberated most of the water reservoirs located in Karabakh including Sarsang reservoir. This further shows us the extent of fragile water security structure in the region and the extent of its loss in terms of water and energy.

Another water-related transboundary problem of Armenia has a profound effect on its water security, being between Ankara and Yerevan. The situation relates to Arpacay River and the Arpacay/Akhurian Reservoir located on the border of Turkey and Armenia. Arpacay River is 186 km long and is used as an irrigation resource by both countries (Gültekin, 2010), and is part of the Kura-Araks River Basin. In the Soviet era, an agreement was signed with Turkey in 1927 according to which the co-riparian states would have an equal share (Gültekin, 2010). After 6 decades, a joint dam was constructed to manage the quantity of the shared water (ECC, n.d.). Further cooperation and facilitation agreements were signed and remained in effect following the collapse of the Soviet Union (ECC, n.d.). Though the previous agreements addressed the quantity issue, there was no provision related to quality (ECC, n.d.). Furthermore, the ongoing conflict over Nagorno-Karabakh has ensured tense bilateral relations, not to mention historic hostility, as the two countries decreased their diplomatic communications and interactions, and the situation has become more complicated following the second Karabakh War. Aside from the hydro-ecology and quality problems, the countries failed to address this issue, and no legal framework or information sharing existed, resulting in water insecurity. Regardless of how smooth the past water-related initiatives have been, new projects over the river would not only affect the amount

but also the quality of water, as there are no restraints or provisions to prevent it.

In both similar and different manners, Iran and Armenia share the Araks River, and have begun constructing a dam, like in the Arpacay case between Turkey and Soviet Armenia. The water supply from Araks River is of great importance to both countries, if not a matter of security. What makes the difference is that the relations between Iran and Armenia in multiple areas remain unproblematic, and while the achieved cooperation mechanism continues to function, this may not always be the case, and the Iranian side occasionally accuses Armenia of polluting the water of the Araks River (Bakhtiari, 2019). Beyond the water issue, the Iran-Armenia relationship is not built on solid foundations, and is sometimes on thin ice, and the bilateral dialog is pragmatic rather than strategic. Under such circumstances, any steps taken against the interests of either side would result in a deep shock with potential repercussions on water security. Since all Armenian water resources are transboundary, their security should be considered vulnerable and fragile.

Beyond the insecurity related to the transboundary nature of its resources, there is another variable, natural disasters that essentially determines the extent of water security. For instance, in 2000, Armenia suffered a serious drought that was devastating to the subsistence farmers inhabiting the mountainous areas who depend on rain-fed irrigation. The initial losses amounted to \$110 million, while the subsequent losses of agriculture products were estimated at \$43 million, in a country where agriculture accounts for almost 30 percent of the GDP and half of the employment (World Bank, 2017, p. 14). As a result of low precipitation and high temperatures, rainfall in some areas fell by around 70 percent. Most of the crops were lost, leading also to a seed shortage the following year (World

Bank, 2017, p. 14). In 2006, another drought hit, though not as severe, and the resulting decrease in crops forced Armenia to import cereal to meet its requirements (World Bank, 2017, p. 14). In recent years, extreme weather events, droughts, floods, hot dry winds and hailstorms have become more common, and not only last longer, but also bring greater devastation. The total damage from 1994 to 2014 is estimated to have reached around \$1.5 billion (World Bank, 2018), including agricultural damage and losses; damage to property; and medical-sanitary losses. Floods caused by climate change and seasonal flows cripple all activities around rivers, particularly in the Araks River Basin, where people have lost their lives, clean water is scarce, and it has not been possible to cultivate sufficient food products. Furthermore, droughts and floods often leave farmers without access to sufficient irrigation water, which directly affects the economy in terms of national products and food security. Armenia is geographically prone to such disasters, and its water security is frequently threatened.

It can thus be concluded that water security is a multidimensional issue with influence over a broad range of subjects, including agriculture, food security, economy and humanitarian security. During times of disaster or insecurity related to outside countries, not only water is affected, but also all of the above issues. Water insecurity attributable to external variables can have significant consequences for both states and citizens in the form of food insecurity; unsustainable socio-economic development; humanitarian problems, such as inability to maintain protection against water-borne pollution and water-related disasters; unfavorable conditions for ecosystems and human well-being. More specifically in the Armenian case, water security has a direct impact on energy security, given its ability to meet its needs from domestic resources, resulting in a high reliance on hydropower, as a result of which, water

security becomes more important than ever. Energy security is analyzed more comprehensively in the following section.

Energy security in Armenia

The concept of energy security is defined by the International Energy Agency (IEA) as “the uninterrupted availability of energy sources at an affordable price”. According to the IEA, energy security has several aspects (IEA, 2019): “Long-term energy security mainly deals with timely investments to supply energy in line with economic developments and environmental needs. Short-term energy security focuses on the ability of the energy system to react promptly to sudden changes in the supply-demand balance”. More simply (Hettiarachchi & Kshourad, 2019, p. 165), it refers to: “Reliable and affordable energy services for cooking, heating, lighting, communications and other productive uses”. Among the dozens of different conceptualizations or terminologies used, these definitions are sufficient to explain what energy security is and deals with. Natural gas, as Armenia’s primary source of energy, account for almost 60 percent of the total, while nuclear power provides 22 percent and hydropower around 10 percent (IAEA, 2019). Regarding electricity in Armenia, nearly 40 percent is provided by thermal power plants, 30 percent by hydroelectric power plants and approximately 30 percent by nuclear power plants (IAEA, 2019). In more detail, its thermal power plants have an annual capacity of 2.43-gigawatt electrical (GWe) and produce around 3.4 billion kWh electricity (IAEA, 2019). On the other side, hydropower has a total capacity of 1.33 GWe and supplies nearly 2.4 billion kWh each year (IAEA, 2019). Finally, nuclear reactors have a 0.38 GWe capacity and produce the nearly same amount as hydropower, though with less capacity (IAEA, 2019).

Having looked at Armenia's energy picture, some problematic circumstances have emerged in interdependent aspects, namely supply shortages, reliability of resources and refundable prices (ITA, 2019). With regard to the energy security definition provided above, Armenia faces serious challenges to security. To begin with, its dependence on foreign resources draws primary attention. More specifically, since it lacks any proven oil or natural gas reserves, three-quarters of the total energy demand in the country is met through imports of oil and natural gas (IAEA, 2019). Furthermore, it has very limited coal deposits and has no production. The supply problem related to Armenia's foreign resource dependency often emerges as a problem for Armenia. Electricity generation is on the other side of the coin. Even though nuclear power plants provide a high percentage of the total electricity, the fuel is imported from Russia. Moreover, thermal power plants and the necessary natural resources required to operate also fall under the same foreign resource-dependent and insecure circumstances. Georgia, Iran, Europe, and Russia are Armenia's most prominent energy import partners.

Reliable resources and prices, just like the supply shortage issue, are influenced by the nation's foreign resources dependency. As such, Armenian authorities are keen to close old-generation nuclear power plants rather than extending their lifespan (ITA, 2019), seeking more reliable and affordable electricity, and being unwilling to pay million dollars only for an extension. A significant point that should be underlined here related to thermal power plants is that Armenia is not only dependent on external countries due to its lack of resources, as two out of the three companies operating these plants are of foreign origin or operated with foreign capital. For instance, the Hrazdan Energy Company, owned by the Federal Agency for State Property Management (*Росимущество*, *Rosimushchestvo*)

operates the Hrazdan Thermal Power Plant, which has one of the most significant capacities with 1100 MW (nearly half of the total capacity) in the country (Hrazdan Energy Company, n.d.; ITA, 2019). It operates in smaller numbers than the Yerevan TPC, which also controls the market and electricity transfers, but having foreign capital-based companies in the energy sector of such sizes is a potential threat to energy security (ITA, 2019). Protests in Yerevan in 2015 in which 2000 people took to the streets to demonstrate against the electricity tariffs had a connection with the Russian influence, if not dominance, on the Armenian energy sector (Demytrie, 2015; Avedissian, 2015) which stand as a solid proof of Armenia's foreign resource dependency.

As a result of the above, Armenia's primary goal is to develop its domestic energy resources (particularly renewable energy), followed by the replacement of the existing nuclear reactors. At the same time, it is looking at ways to enhance its energy efficiency as a further means of contributing to energy security. To this end, several laws have been enacted, including the Law on Energy (IEA, 2012), which addresses inter-agency relations in the energy sector, and under the same law, the importance given to renewable energy has been increased. The Law also details a purchase guarantee for all electricity generated from renewable energy sources (ITA, 2019; Energy Community, 2017, p. 24), from which the state's desire to encourage renewable energy production can be clearly understood.

Renewable energy resources, primarily hydropower, may be seen as the most significant and reliable solution for the nation's energy security, although its acknowledgment as the solution is a highly controversial topic. Indeed, the most advanced renewable energy technologies in Armenia can be found in the hydropower sector, which has a total capacity of 1.33 GW (The Ministry of Energy Infrastructures and Natural Resources of

the Republic of Armenia, n.d.). The Hrazdan and Vorotan rivers are hosts to 10 power plants that generate the majority of the country's hydroelectric power (The Ministry of Energy Infrastructures and Natural Resources of the Republic of Armenia, n.d.). The Sevan-Hrazdan cascade comprises seven power plants with a total capacity of 560 MW that are designed to generate 2.3 billion kWh electricity – being the Sevan (34 MW), Hrazdan (81 MW), Argel (224 MW), Arzni (70 MW), Kanaker (102 MW), Yerevan-1 (44 MW) and Yerevan-3 (5 MW) hydropower plants (HPPs). The Vorotan cascade, on the other hand, comprises three power plants, featuring the Spandaryan (76 MW), Shamb (171 MW) and Tatev (157 MW) hydropower plants, with a total capacity of 404 MW. In addition to these, there are 187 smaller hydropower plants with a total capacity of 370 MW.

The country has been supplying more than one-third of its total electricity demands through HPPs, and almost three-quarters of the total renewable energy are produced by hydropower. Armenia's current hydroelectric generation capacity is around 1,325 MW. While the potential water energy resources of Armenia amount to 21.8 billion kWh, the total electricity generation in 2018 was 2 billion kWh (The Ministry of Energy Infrastructures and Natural Resources of the Republic of Armenia, n.d.), indicating that the potential is far beyond the current generation, and so production may be enhanced to close the gap between the potential and actual generation.

This gap is why this topic is controversial in terms of the solution. Armenia's geography and topography prevent the nation from utilizing its full capacity. Furthermore, the annual flow of the rivers, precipitation and weather conditions directly affect the amount of electricity that can be generated, being an inevitable environmental effect. Moreover, natural disasters such as floods and drought can also have unpredictable impacts on

hydroelectric power plants and their production process. Independent from the hydroelectric power plants, these are regarded as the general cons of renewable energy resources, and the picture would not change if there were greater reliance on solar or wind power.

Overall, none of the primary energy or electricity resources of Armenia can be categorized as domestic or national, except hydropower, and the foreign dependency and external influence over the energy sector threaten energy security. Hydropower in this respect stands as the only domestic resource that could reduce the influence of foreign states. However, the water resources that hydropower in Armenia relies on are mostly fed by transboundary rivers, making them prone to the external effects of nature. Nature itself determines the water flow, and consequently, the amount of electricity. In some seasons, due to the effects of precipitation and temperature, these plants may even become inoperable, and so relying on hydropower for energy security can be dangerous considering the increasing demand. Armenia's geography and political relations also prevent a diversification of its energy supply, meaning that it has little opportunity to ensure its energy security.

Conclusion

Water security is considered indispensable due to its multidimensional nature. It is the main determinant of food security, agriculture, sustainable development, energy security, humanitarian security, sanitation, and beyond all, life itself, and all of these aspects are interdependent. An absence of water security can have a fundamental impact on survival, and so is a priority for countries.

With the dissolution of the Soviet Union, the water security issue gained greater prominence, as what were once Soviet resources became transboundary. Just like the other regional

nations, Armenia was left with no laws or regulations related to the sharing of water resources, which thus became an obstacle standing in the way of regional cooperation and the assurance of water security. Looking at Armenia's water resources and the annual flow rates, one may understand that it has no concerns whatsoever regarding water security, although two factors must be taken into account, being the shared status of all of its water resources, and the threat of natural disaster or environmental impacts. The absence of a proper, functioning regime related to water usage clearly makes Armenian water security vulnerable, given the potential for conflicts over the share of water or clashes that have consequences on water security. This issue is exacerbated by the suitability of the geography for natural disasters, which makes the situation even more complex.

For Armenia, beyond its survival, food, humanitarian, developmental and agricultural needs, the energy sector is also heavily dependent on water security, since the majority of its electricity is generated from hydropower. In the event of any decrease or uncertainty in its access to water, the country could find itself in a chaotic situation, with the potential to turn into catastrophes of different extents that could be extremely expensive for Armenia. To conclude, Armenia's water security is extremely vulnerable to threats, and its insecurity in this area makes the topic of energy security even more important. It would thus be fair to say that the global significance of water is double for Armenia.

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