

*Assessing the Impact of
Climate Change on the
Level of Intangible Cultural
Heritage Provided by
Azerbaijan's Water Bodies*

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Water bodies in the mountainous and coastal regions of Azerbaijan, including rivers, lakes, springs, and waterfalls, host many cultural ecosystems. These have led to both tangible and intangible cultural heritage creation and contain a perfect level of human–nature relations. Climate change is a complex phenomenon that is affecting all areas of human life, including water-related ICH. Its effects cause existing traditions, knowledge, and skills to be gradually abandoned and forgotten, which in turn leads to the disappearance of ICH. Global climate change also affects employment among the population in other areas, such as agriculture and reduces traditional incomes. This leads to the gradual migration of the rural population to urban areas and, as a result, the loss of traditions related to intangible cultural values.

Water Resources in Azerbaijan

Azerbaijan's Third National Communication to the United Nations Framework Convention on Climate Change (IPCC, 2019; Ministry of Ecology and Natural Resources, 2015) indicates large-scale fluctuations in long-term temperature and precipitation. Climate change is expected to raise average temperatures in Azerbaijan, leading to stronger and longer summer heatwaves and droughts, as well as a significant decrease in average annual rainfall. Overall, this means that the country will likely become hotter and drier, posing serious challenges to water supply and ecosystem production. Modeling the optimistic scenario (Representative Concentration Pathway [RCP] 4.5), water resources in Azerbaijan (together with transboundary water resources) will decrease by 5–10% by 2040 and by 10–15% by 2070; in the pessimistic scenario (RCP 8.5), they will decrease by 10–15% by 2040 and by 15–25% by 2070 compared to current values (Ministry of Ecology and Natural Resources, 2021: 34).

The depletion of water resources threatens water-related ICH (Willems and van Schaik, 2015). These threats include pollution of water sources (Abbasov and Cervantes, 2021: 4), increasing demand for water, and climate change. The main purpose of this study was to determine the impact of climate change on the ICH created by water bodies. As is well known, water bodies show the main manifestations of climate change and are more sensitive to changes in temperature and precipitation levels than other ecosystems.

ICH and Water Bodies in Azerbaijan

The cultural benefits of freshwater ecosystems include a broad palette of values. It would be very hard to imagine many recreational activities without the contribution of freshwater ecosystems (Ahmad, 2006: 298; Dorfman, 2011: 16). Generally, freshwater ecosystems have important functions that support tourism and recreation (Hall et al., 2016: 15), hosting activities including river-rafting, kayaking, hiking, swimming, and fishing. Cultural services are becoming increasingly important as people's incomes and leisure time increase.

Existence value is a willingness to pay for only the existence of environmental resources. For example, donations toward the protection of Caspian seals can be considered the existing value of these species. Option values, meanwhile, are related to uncertainty and irreversibility, and primarily consider water as an asset rather than as a flow of services. The option value sees the value of freshwater ecosystems as a potential source of benefits that can be realized in the future.



Istisu hot spring in the Small Caucasus Mountains of Azerbaijan. The temperature of the water, which emanates from the magmatic layers under the earth is close to 60°C and is used to treat various diseases. 2022 © Elshad Askerov

Although Azerbaijan is located in an arid area, it is also home to the largest rivers in the Caucasus, the Caspian Sea, and coastal ecosystems, as well as abundant mountain rivers. Azerbaijanis have been living in close contact with these water bodies for

centuries. Rivers, lakes, springs, the Caspian Sea, and wetlands have profoundly affected people's lives (Abbasov and Smakhtin, 2012: 74). The species of fish and birds in the various water bodies and other animals that live in close relation with water have played a very important role in human life. The diverse values associated with hunting, fishing, and water use have also had a profound effect on local culture. Proverbs, tales, ceremonies, rituals and traditions, food, and various forms of water use have created a broad range of forms of ICH related to water in Azerbaijan (Figure 1).

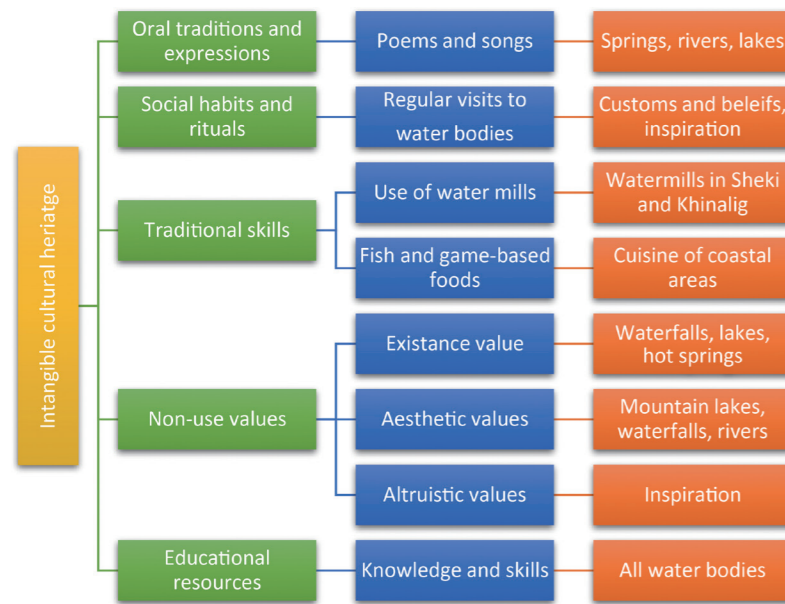


Figure 1. ICH provided by water bodies of Azerbaijan

Oral Traditions and Expressions

Many examples of poems, songs, and folklore are dedicated to various water bodies in Azerbaijani literature and folklore. Poems and songs related to the Isa spring, Caspian Sea, Göygöl (Blue Lake) and the Kura and Araz rivers are pertinent examples of water-related ICH. These types of expression often appear in traditional *ashuk* songs and sayings.

Social Habits and Rituals

Regular visits to water bodies in Azerbaijan occur for several reasons. For example, in most parts of the country, going to the lake or river on the morning of Novruz (New Year celebration) and bathing there has long been a traditional ritual. In many cases, visits to water bodies are for tourism and recreation purposes. For



Left. On the last Wednesday of Novruz, people march to Göygöl lake. It is believed that visiting at this time will bring peace and happiness in the new year. 2021 © Rovshan Abbasov

Right. People from the mountain villages of the Guba district regularly visit the lake near Mount Tufan to conduct both rain- and sun-calling rituals. 2019 © Aslanov Feyruz

example, water bodies such as the lakes Göygöl and Maralgöl hold aesthetic, spiritual, and recreational significance. Estimates show that, on average, more than thirty thousand tourists visit Göygöl every year. The existence of these lakes in their current state, with a clean and healthy ecosystem, also creates a very important existence value for the Azerbaijani population.

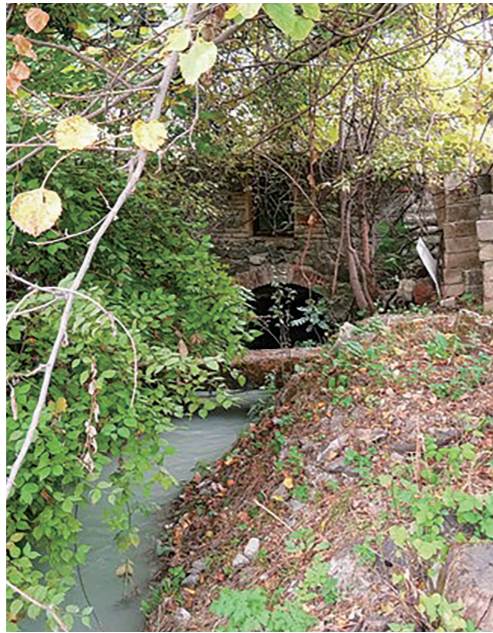
People from mountain villages of Guba District regularly visit the lake near the mountain Tufandağ to perform both rain- and sun-calling rituals. During long droughts, people visited the lake Tufangöl, prayed for rain, and offered sacrifices. The ceremony for summoning the sun was similar and also took place around Tufangöl.

Water has been considered sacred in Azerbaijan since ancient times. For this reason, water pollution is always considered a serious sin by local communities. One of the four Wednesdays celebrated during the Novruz holiday is dedicated to water. Rainfall has always been considered a divine miracle in Azerbaijan, and various examples of folklore about rain have been noted. These patterns became more common at a time when rain-fed farming was widespread.

Water Mills

Historically, water mills have been widely used in Azerbaijan to grind grain. An example of these mills is located in Sheki. The water mill there has both tangible and intangible significance, and

is currently used for grinding rice, which is used in baking halva, a very popular dessert in Sheki and wider Azerbaijan. Making halva involves a lot of knowledge and skill, which have been accumulated over hundreds of years. Currently, the mill at Sheki, discussed further below, is the only rice mill not only in Azerbaijan but



The water mill at Sheki is the only rice mill not only in Azerbaijan but also the wider region. Rice is ground here for use in baking halva, a very popular regional dessert. 2021 © Rovshan Abbasov

also the wider region. This water mill is one of the most striking examples of the use of ICH and ecosystem services. The use of water power and design of the mill race is also of great historical significance.

Food Traditions and Dishes

The people living on the shores of the Caspian Sea in Azerbaijan, as well as around the Kura and Araz rivers, are known for their variety of fish-based dishes. Fish dishes have become very important in the life of this population and remain so today. One of the best known is *kutum lavangi*, a white-fish-based dish popular in the southern regions of the country, especially Lankaran. The preparation of this dish requires a lot of knowledge and skill and is considered a ritual. Kutum lavangi is served on the last Wednesday of Novruz, and is considered the main ceremony of this holiday.

Black caviar, one of the most expensive and scarce delicacies, is mostly obtained in spring and autumn from sturgeon living in the Caspian Sea and its tributary rivers, one of the main areas for caviar production in the world. The black caviar harvesting season begins when species such as sturgeon (*Huso huso*) and trout (*Salmo trutta*) go to the rivers to spawn, so it is very important the

water levels there are sufficient. Throughout history, the people living on the shores of the Caspian Sea in Azerbaijan, at the mouth of the Kura River, have been involved in the preparation of black caviar.

The people living on the western shores of the Caspian Sea, wetlands, and river banks have historically had very good hunting and fishing skills. These skills and knowledge include many ICH qualities. For example, the values associated with food made from coots (*Fulica*) are directly related to the existence of marine and swamp ecosystems in which this particular bird lives. The same can be said of various fish dishes and ceremonies in which these dishes feature. Skills such as boat-making, net-making, fishing, and fish-drying can also be considered ICH (Figure 2).

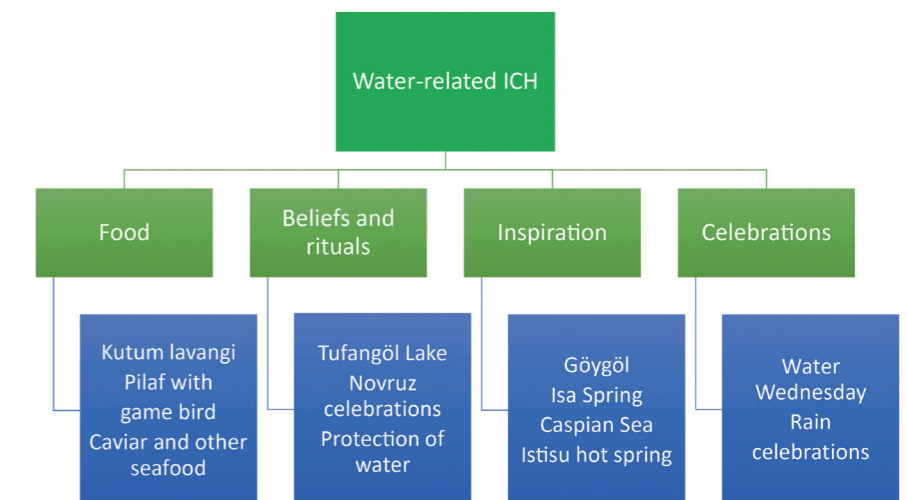


Figure 2. Examples of ICH related to water

Climate Change and Intangible Natural Heritage

There is no area of human life that is not affected in one way or another by climate change. In this regard, water-related industries, human life, and traditions are more sensitive and vulnerable to climate change (Fatorić and Biesbroek, 2020: 210; Fatorić and Seekamp, 2017: 229).

The impact of climate change on water-related ICH is both direct and indirect (Fatorić and Biesbroek, 2020: 310; Fatorić and

Seekamp, 2017: 230; Maldonado-Erazo et al., 2021: 70). These effects cause existing traditions, knowledge, and skills to be gradually abandoned and forgotten, which in turn leads to the disappearance of ICH (García, 2019: 115; Kim, 2011: 280).

The direct effects are primarily a decrease in the amount of fresh water and an increase in temperature. Decreased water levels do not allow ecosystems to function properly and in many cases weaken food pyramids. For example, declining river water levels impact the routes of fish migrating to rivers from the Caspian Sea to spawn. Although such cases are more typical for small mountain rivers (Abbasov and Smakhtin, 2012: 76; Abbasov and Smakhtin, 2009: 1070), during spawning in 2018–21, even large rivers such as the Kura dried up. As a result, the natural spawning grounds of fish in the Azerbaijani sector of the Caspian Sea have almost completely disappeared. Of course, this posed a serious threat to all ICH associated with fish, and in many cases led to its loss. Similarly, in lakes and the Caspian Sea, there has been a sharp rise in water temperature as a result of climate change (Arpe et al., 2014: 50). This has led to a decrease in the amount of oxygen in the water and, as a result, the deterioration of environmental conditions for fish.



Springs used to be a source of water and held certain values. Alxasli spring near Khinalig village releases water only during summer, when local people come to the pastures. 2021 © Rovshan Abbasov

The socioeconomic effects of climate change are manifesting gradually and may take a rather long time to become fully apparent, but it is already leading to both a gradual abandonment of traditional life within the community and a gradual migration from rural to urban areas. For example, declining pasture productivity and loss of traditional incomes have led people in the northern regions of Azerbaijan to abandon their traditional lives and move to larger cities. This is evident in the villages of Gryz, Khinalig, Haput, Zarat, Burovdal, Ahan, and others, which are historically associated with agriculture and nomadic livestock.

Locals confirm that only eight of the two hundred existing farms in Burovdal remain. In many cases, even if migration does not occur, the drying up of springs, deforestation, and increased erosion is leading to the abandonment of traditional life (Figure 3).

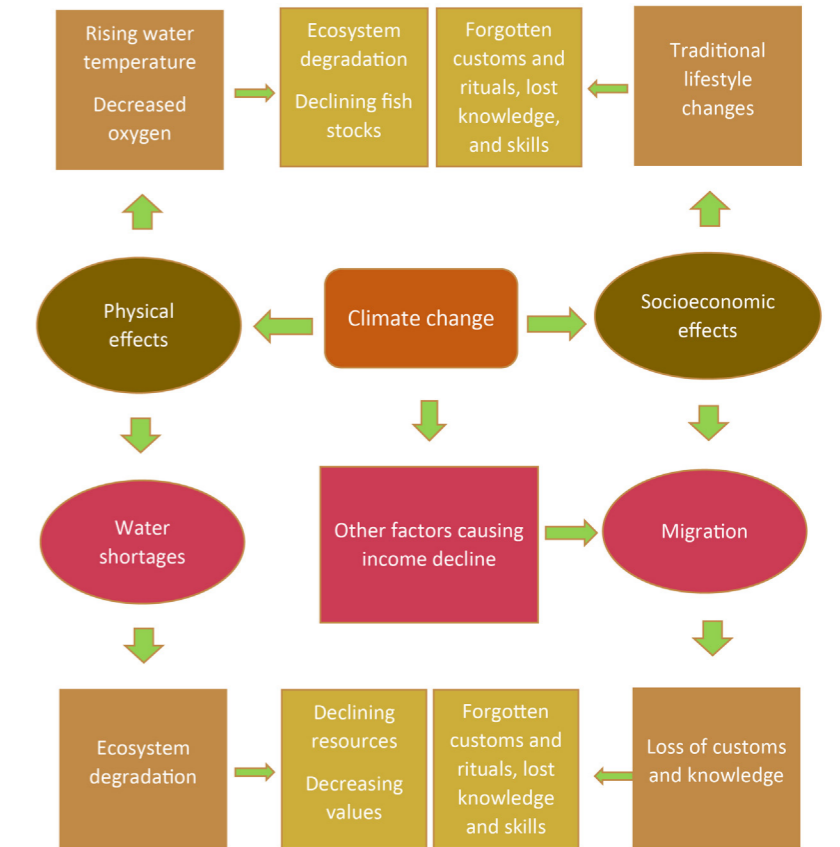


Figure 3. Impact of climate change on ICH

Water-Related ICH and Community-Based Management Practices

Sheki Water Mill and Dayirman Canal

The water mill located in the city of Sheki dates back to the eighteenth century. A special canal, the mill ditch, was built to operate this mill. Today, the water mill, which is still in operation, is of historical importance as well as remaining functional. Currently, the mill is protected by the state as a historical monument. Today, the mill mainly grinds rice for the rice flour used in making halva. Currently, this mill is the only one that

grinds rice not only in Sheki and Azerbaijan but also in the wider region. The canal was restored in 2018 at the initiative of the local community.

Tajliq Su Water Pipe



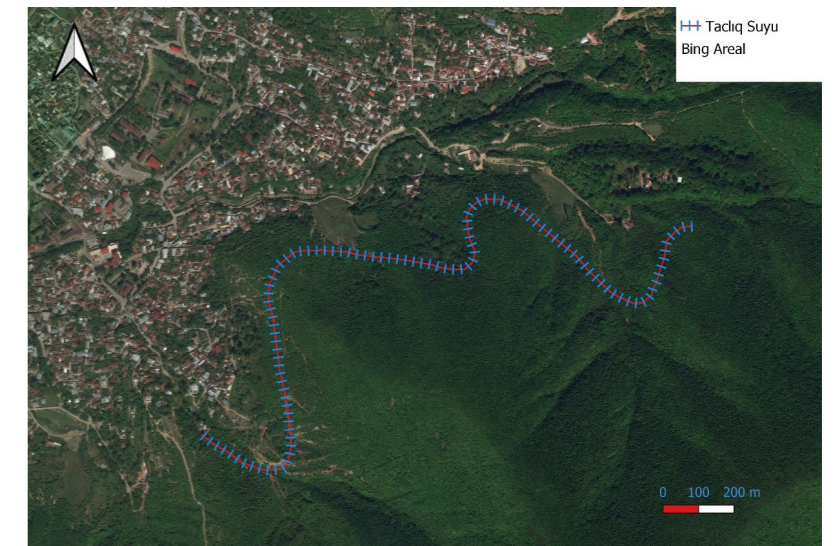
The Tajliq Su water pipe brings water to the Ganjali part of Sheki. Local residents estimate that it is at least 300 years old. 2021 © Rovshan Abbasov

The Tajliq Su is a waterway built to transport fresh water from the mountain forests around Sheki to the historical parts of the city. This water is clean and does not require any treatment. Tajliq Su was built in the Middle Ages, during the Shaki *khanate*. Currently, the pipeline, which is about 5 kilometers long, brings water to the Ganjali area of the city (Figure 4). There is no information on the exact date and details of its construction; however, local residents estimate that it is at least 300 years old.

This waterway, designed by local masters and built using clay pipes, is an underground channel laid at a depth of 1 to 1.5 meters. The gradient of the pipeline is very shallow and the flow of water is thus very weak. This is the only way to carry water under its own flow in an area with a unique relief. During the design of this underground pipeline, very accurate measurements were made of the mountainous terrain and the necessary inclinations were determined.

Currently, Tajliq Su is carefully guarded by local communities, who last performed significant restoration in 2010. They periodically clean the pipes and, if necessary, repair degraded parts. Residents who take water from the pipeline do not pay for

Figure 4. Map of the Tajliq Su waterline



any water service. They believe that as their water comes directly from nature they do not need to pay the local water company. Local resident Samad Jabbarov says that if properly maintained, the line will always be a major source of water for the local population.

In recent years, climate change has reduced the water levels in Tajliq Su. Although the local population is trying to find additional sources, so far these efforts have yielded no results.

Tufangöl

Tufangöl is the highest mountain lake in Azerbaijan, sitting 3,277 meters above sea level between the Kurvedağ and Tufandağ mountains, in the north of Qabala District near the border with Qusar District. Local people believe that Tufangöl is sacred and that the boat of the Prophet Noah is located in the lake. Historically, as noted above, locals used to visit the lake to perform both rain- and sun-calling rituals. Rain-calling ceremonies took place during droughts; conversely, when the weather was poor for a long time, the locals prayed to Qibla Mountain and wished the sun to rise.

Climate Change-Related Vulnerabilities

Existing Vulnerabilities

The main manifestations of climate change in Azerbaijan are the decrease in precipitation due to rising temperatures, the decrease in the water level of rivers and lakes, and the warming of water temperatures in lakes and the Caspian Sea. The level of impact of these issues on different elements of life, as well as ICH, depends on the level of preparedness. While the main reasons for this impact are the depletion of water resources and the loss of existing functions of aquatic ecosystems as a result of climate change, another reason is the large number of vulnerabilities at both the community and national levels. Numerous studies have been devoted to analysis of vulnerabilities in natural disasters. Although much research has been done on the assessment of vulnerabilities to climate change (e.g., García, 2019: 115; Harrison and Rose, 2010: 40), the relationship between these vulnerabilities and ICH has not been sufficiently studied. Indeed, the study of ICH is often associated with conditions that arise under the influence of social factors, rather than the presence or absence of environmental resources (Abbasov, 2018).

“Vulnerability” means being unprepared for any natural hazard, including climate change manifestations. It is a state determined by physical, social, economic, and environmental factors or processes, which increase the defenselessness of a community in the face of hazards. On the other hand, “capacity” is the resource, skill, and strength possessed by people, communities, societies, or countries, which enable them to prevent, mitigate, prepare for, withstand, or quickly recover from negative impacts. Vulnerabilities in terms of the negative effects of climate change on ICH are mainly the lack of capacity and activities aimed at safeguarding existing heritage sites or the lack of capacity to adapt to new conditions for the safeguarding of ICH. In other words, vulnerability to climate change can be defined as a condition combining exposure and limited capacity to adapt to undesirable changes in climatic conditions.

Vulnerabilities that can arise as a result of climate change tend to be invisible, unlike other vulnerabilities, and their

negative effects can be gradual and long-lasting. Therefore, unlike tangible heritage elements, ICH losses are often invisible and unrecognizable, and may sometimes last for decades.

The vulnerabilities created by climate change are growing. For example, if fodder crops in the agricultural sector become less and less resistant to climatic conditions, the livelihood of farmers and the related community whose main income depends on that plant will gradually deteriorate and thus vulnerability will increase. This impact can lead to the gradual abandonment of traditional animal husbandry and, in parallel, the loss of any ICH in which the community is involved. If the community is able to address the fodder problem through alternative means, the traditional activity can be maintained.

Vulnerability is a factor that can contribute to the transformation of climate hazards into undesirable consequences. In this case, we see climate change not as a catastrophe, but simply as a threat, and vulnerability in this sense can play a major role in turning an expected threat into a catastrophe. For example, lack of early warning systems in case of floods, potential collapse of dams due to age, low preparedness levels among a community, lack of community evacuation plans, and poor condition of facilities are considered factors of vulnerability. Such vulnerabilities are known as structural vulnerabilities; community buildings with such issues are vulnerable to natural disasters caused by climate change (Abbasov, 2018).

Social and Economic Vulnerabilities

Vulnerabilities in the safeguarding of ICH from climate change arise for a variety of reasons, the most significant of which are social vulnerabilities. Weak infrastructure, the absence of traditions aimed at managing hazards, poverty, low levels of awareness, and shortage of supplies to help with adaptation to climate change make local communities very vulnerable to climatic hazards. Poor conditions reduce the capacity of local communities to face climate changes without the loss of traditional ways of life. The situation is also exacerbated by the long-term living styles of the local society, which are based only on routine daily maintenance rather than considering latent changes in the environment.

There are many factors contributing to social vulnerabilities in Azerbaijan, and these, in turn, result in individuals and communities being unprepared for negative changes. The most significant of these are reduced incomes in communities that are involved in support of ICH. These rapidly declining incomes in rural areas are leading to communities becoming more isolated and residents migrating to large cities. When bearers of ICH relocate to large cities to find work, existing traditions are gradually forgotten. This poverty is set against the backdrop of declining incomes due to climate change and worsening social conditions since the 1990s.

Examples of ICH related to water are thus not only threatened by water scarcity, but also as a result of declining traditional incomes.

Institutional Vulnerabilities

When analyzing existing vulnerabilities in terms of ICH protection, institutional vulnerabilities should be identified and assessed. Institutional vulnerability is manifested at both the national and local levels and covers a broad range of problems (Gruber, 2011: 150). At the national level, institutional vulnerability is primarily found in activity relating to laws and institutions aimed at safeguarding ICH. The following factors of vulnerability at the institutional level should be highlighted:

- Lack of legislation aimed at protecting ICH. The Law on Culture and the Rules for the Protection, Restoration, and Rules of use of Cultural Heritage in the Republic of Azerbaijan includes restoration activities that ensure the protection of non-cultural heritage and its sustainable transmission from generation to generation. In recent years, Azerbaijan has taken significant steps to protect ICH, and currently, fifteen ICH sites are registered by UNESCO. However, not many water-related non-cultural heritage sites have been identified so far. In this regard, it is important to register many springs, artificial waterways, and canals, as well as water-related nutrients and foods as protected examples of ICH.

- Absence of necessary functions of institutions aimed at the protection of ICH. Although these institutions exist at the national level, the protection of ICH at the local level is not institutionalized. Local communities and municipalities often do not participate in the safeguarding of ICH in their territories. Due to the loss of traditional income associated with climate change, such safeguarding activities are not prioritized within the community.
- Absence or lack of conservation activities aimed at safeguarding the water-related tangible cultural heritage elements. Many examples of tangible cultural heritage are also associated with the existence of ICH. For example, the construction of canals and waterways requires a lot of knowledge and skills, some of which can be considered ICH (Nic Eoin and King, 2013). The loss of these skills prevents the emergence of new legacies in the future.
- Lack of mechanisms to ensure the safeguarding and transmission of ICH at the community level. In this regard, it is important to organize vocational education and take steps to safeguard this knowledge at the community level and ensure it is passed on to future generations. For example, the above-mentioned historical knowledge and skills related to the construction of canals and wells are gradually disappearing.
- Lack of protection for natural water bodies that support ICH. For example, small rivers require better protection to ensure fish species that form the basis of caviar and other food can thrive. In this sense, the provision of environmental flows by European standards, the prevention of river pollution, and other related issues are still to be resolved at the institutional level (Abbasov and Smakhtin, 2012: 78; Beroya-Eitner, 2016: 331; EU, 2015: 13). Restoration of rivers would not only ensure the sustainable use of fish resources but also protect other ICH belonging to these bodies of water.

Any climate-related disaster features two main components: climate hazard and vulnerability. As noted, a hazard is a natural phenomenon observed in nature while a vulnerability is a state of

non-preparedness in respect of such hazards. When the natural threats posed by climate change encounter vulnerability, the local ICH is bound to be threatened or destroyed. Figure 5 demonstrates the relationship between climate hazard, vulnerability, and disaster.

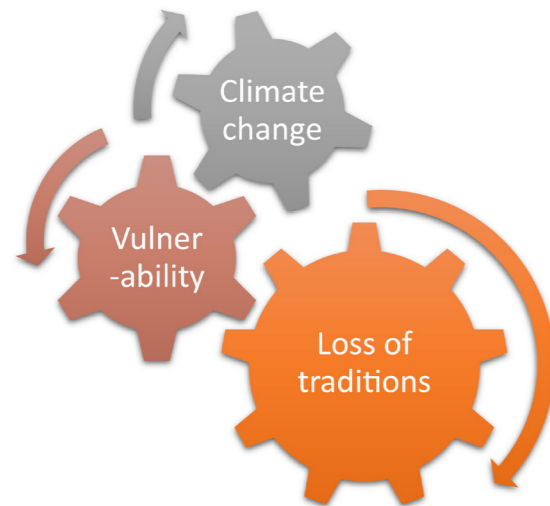


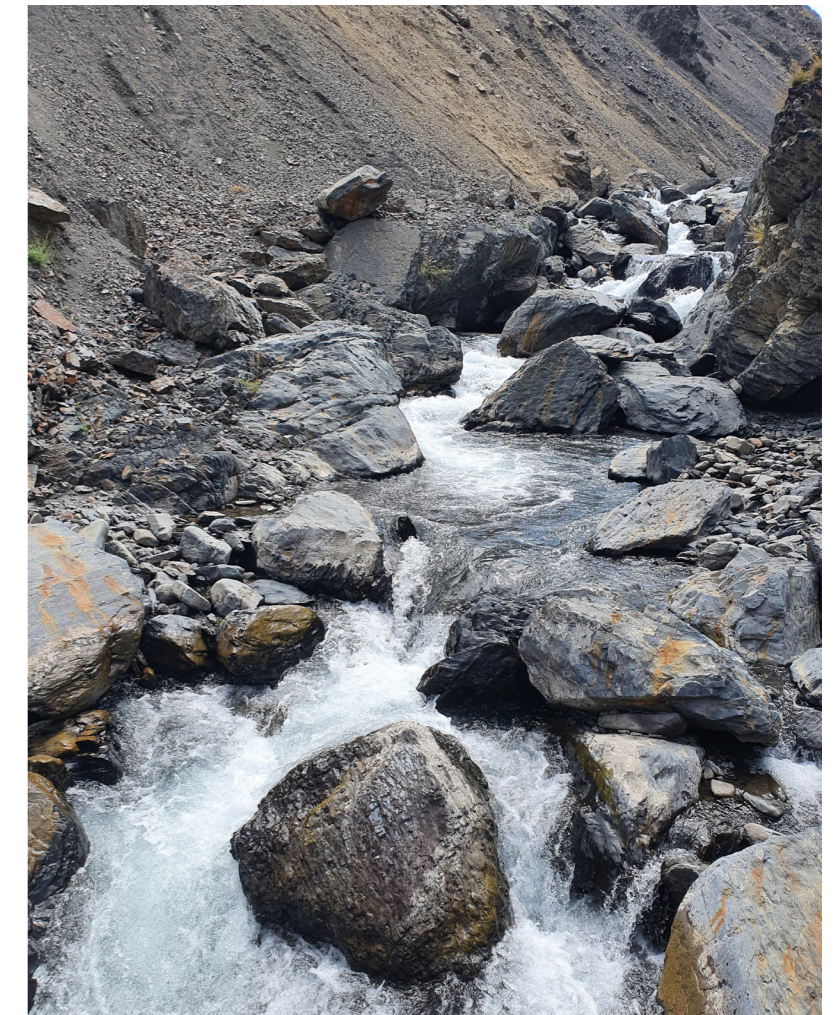
Figure 5. Climate change and vulnerability cause the loss of traditions

Several studies confirm that families and groups with low incomes are more vulnerable to the negative effects of climate change (Shirvani Dastgerdi et al., 2020: 20). For example, if a community does not have resources that can be used during times of drought, then any drought will have a greater impact on that community. To be well adapted for climate change, farms need to have a large water capacity and a lot of resources in reserve. Adaptation activities such as growing drought-tolerant plants, switching to water-efficient technologies, and being able to protect against natural hazards of course require people to have adequate capacity and resources.

Therefore, any activity aimed at reducing poverty can be considered an activity that will help to increase the ability to adapt to climate change (Goswami, 2015: 31). In this sense, these vulnerabilities need to be mitigated to increase people's ability to adapt to climate change.

Conclusion

Azerbaijan is a country rich in ICH, with a broad range of examples of elements centered around waterfalls, rivers, lakes, wetlands, and the Caspian Sea. Many of these examples are related to food, others to beliefs and customs, and some to traditional celebrations. Belief in the sanctity of water sources is one of the most ancient values for people in Azerbaijan. There are many proverbs and sayings expressing negative attitudes toward water pollution and the importance of protecting water bodies.



Gur-gur is a water monument on a mountain river. It is believed that the water of Gur-gur is very clean, and that if virgin girls drink from it, they will bear many children in the future.
© Rovshan Abbasov

Climate change has had a significant impact on Azerbaijan's rainfall patterns and water systems. The main impact of climate change on water-related ICH is declining water resources. Many

springs, which used to be a source of water and are imbued with certain values, have seen their water amount sharply decrease or in some cases dry up completely. The situation is similar with waterfalls and swamps, as well as rivers. One result is that spawning grounds for the most valuable fish species in the Caspian Sea have been destroyed. At the same time, the drying up of swamps and the reduction of water in lakes negatively affect the wintering grounds of migratory wild birds. This pattern threatens the values and ICH associated with fish and game-bird dishes. The decline around the Caspian Sea has also led to the loss of connections in river–sea ecosystems.

In addition to the direct effects of climate change, there are also indirect effects that exacerbate the associated problems. Climate change affects the employment of the population in other areas, such as agriculture, and reduces incomes. This leads to the gradual migration of rural populations to large cities and, as a result, the loss of ICH and related traditions.

The main vulnerabilities identified at the local level are the lack of value and initiatives for safeguarding activities and weak community organization. Institutional weaknesses include gaps in legislation and lack of local capacity as well as lack of relevant capacities at the national level. Numerous knowledge gaps, at both the local and national levels, are also major vulnerabilities that need urgent attention.

The vulnerabilities to climate change and natural disasters need the implementation of proper adaptation plans to safeguard water-related ICH.

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