THE SILENT THREAT OF FALLING CASPIAN SEA LEVELS

A CASPIAN POLICY CENTER POLICY BRIEF

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CPC CASPIAN POLICY CENTER

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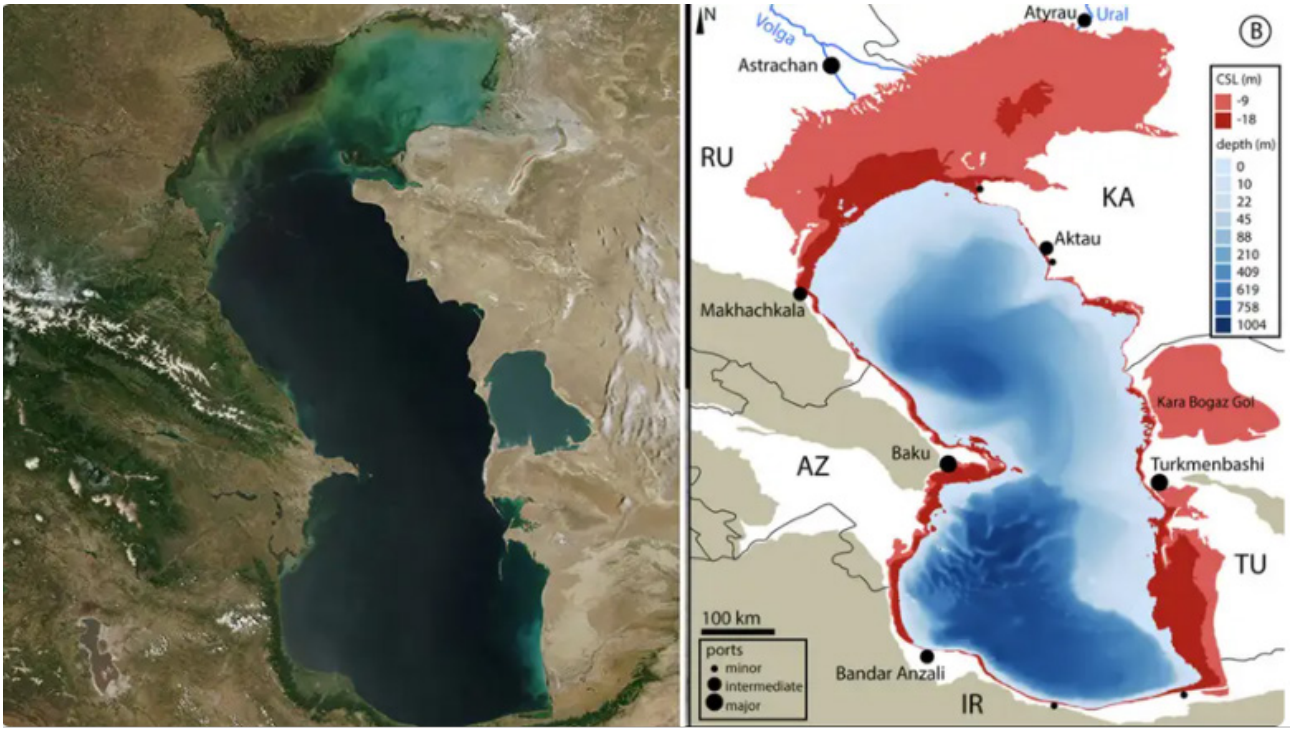
Introduction

The water level of the Caspian Sea, the world's largest inland body of water, is falling dramatically, and this is likely to intensify in the coming years. If left unaddressed, this problem will pose significant environmental, economic, and social problems for the Caspian region. The Caspian Sea boasts abundant natural resources and is a strategically important trade corridor connecting Asia and Europe. It presents enormous economic opportunities for its littoral states–Azerbaijan, Iran, Kazakhstan, Russia, and Turkmenistan–to diversify their export and import channels. The Caspian offers considerable benefits that could play a particularly crucial role in the post-COVID economic recovery, but growing concerns over the Caspian's falling water levels presage disruptions.

A recent study by German and Dutch researchers has set off alarm bells with its projection of an unprecedented drop in water level.[1] The study predicts that, due to increased evaporation rates, largely driven by greenhouse gas-induced climate change, water levels in the Caspian Sea will drop by 9 to 18 meters by the end of the twenty-first century. Substantially lower water levels will create serious problems for the region, including threats to the Caspian's fishing industry and water infrastructure, as well as the food and energy security of littoral states.



Comparison of water levels of the Caspian Sea in 2010 (left) and the projected water loss by the end of the 21st century (right). Source: NASA.

These are not the first bleak projections that researchers have presented on the future of the Caspian. In 2017, a paper published in the Geophysical Research Letters Journal reviewed three major sources influencing the Caspian Sea levels, water flows of rivers emptying into the Caspian Sea, precipitation, and evaporation, and cited evaporation

as the main reason for a decline in water levels.[2] Given that evaporation is contingent on temperature, adaptation rather than mitigation strategies will be critical for countries affected by these changes. Air and water temperatures, and, hence, evaporation levels, will continue to rise regardless of local efforts to reduce emissions. The case of the Caspian Sea is illustrative of the destructive effects of greenhouse gas emissions.

Implications for the Region

Biodiversity

Falling water levels in the Caspian Sea will further reduce already endangered species of flora and fauna, including the endemic seal populations.[3] While the sturgeon populations have already crashed by around 90 percent due to overfishing,[4] pollution, and poaching, continuous water level drops are likely to put additional stress on aquatic animal life since shallow-water habitats, necessary for breeding and feeding, will be at particular risk.[5] With the fisheries industry playing a significant role in the livelihoods of coastal populations, the sharp reduction of biodiversity could jeopardize food security and increase poverty in and outmigration from these communities.[6]

Fishing at the Caspian Sea shore in Baku. Source: New Straits Times.

Climate

In addition to the adverse effects on wildlife and industries directly dependent on the body of water, the decreasing sea levels could dramatically alter climate patterns in the region more broadly. The Caspian plays an important role in Eurasian rainfall patterns,

and the sea's reduced size could make rainwater scarcer. Even in areas where rainfall is currently abundant, such as southern Azerbaijan and Iran's Caspian coast, agriculture and ecosystems could be severely threatened.[7]

Legal Status

Diminishing water levels could also change maritime borders, affecting fishing rights of littoral states and their claims on abundant energy resources in the Caspian basin, estimated at around 48 billion barrels of oil and 292 trillion cubic feet of natural gas in proven and probable reserves.[8] Concerns about the distribution of energy resources have already been discussed during the negotiations on the legal status of the Caspian Sea, a point of contention in the region for almost 30 years.[9] As a result of the Convention on the Caspian Sea in 2018 held in Aktau, Kazakhstan, the Caspian Sea has been granted a special legal status, giving each littoral state exclusive control extending 15 nautical miles from the coastline and a further 10 miles for fishing.[10] Although the agreement is a positive development in a series of long-standing negotiations and marks the beginning of a more cooperative environment around the Caspian Sea, it is still unclear how the seabed, containing most of the oil and gas reserves, will be divided among the coastal countries. Rapidly dropping water levels could place an additional burden on future talks and lead to prolonged negotiations on the distribution of offshore hydrocarbon deposits.

Heads of Azerbaijan, Iran, Kazakhstan, Russia, and Turkmenistan Sign the Caspian Convention. Source: Website of the President of Azerbaijan

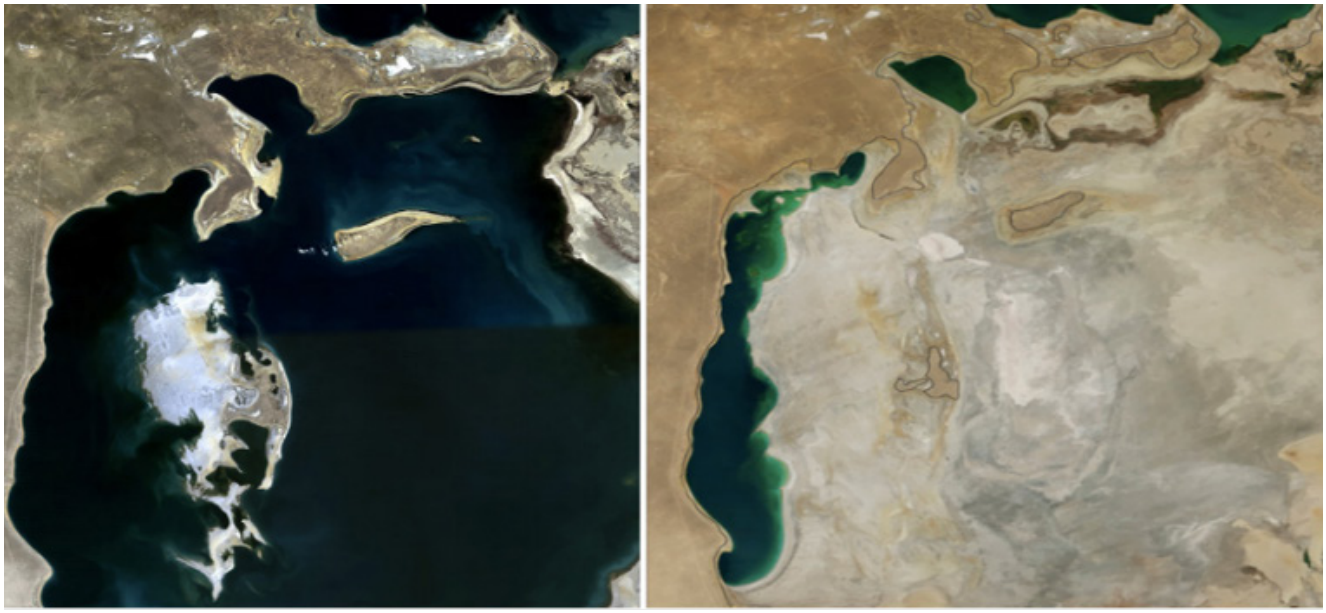
Regional Connectivity Potential

Dramatic drops in Caspian Sea levels could also disturb the operation of existing water infrastructure projects and postpone the construction of newly proposed pipelines, ports,

and canals. For example, in its approved Strategy for the Development of Russian Seaports in the Caspian Basin, Russia is looking to build a new deep-water port by 2025 and to modernize existing port facilities in order to increase international trade and strengthen connectivity in the Caspian region.[11] Disruption of these plans will adversely affect the transportation capacity and energy networks in the Caspian Sea basin. With the water level's fall accelerating, the feasibility studies of proposed Trans-Caspian gas pipelines will also need revision. This, in turn, could present significant headaches for much-anticipated plans to diversify Turkmenistan's transport options and Europe's energy supply chains.[12] Another project, the Eurasian Canal, is planned to connect the Caspian and Black Seas and to provide an alternative route for shipping goods.[13] If successfully implemented, the project could boost the importance of Russia's planned expansion of the Lagan port and transform it into an international trading hub. Still, due to the looming Caspian Sea level crisis, the likelihood of this plan coming to fruition is unclear.

Agriculture and Electricity

Diminishing water levels could also indirectly damage agricultural production and power generation along the Volga River in Russia, which has become a cascade of reservoirs hosting 13 hydroelectric stations.[14] Since around 80 percent of the Caspian Sea's waters come from the Volga, one way to compensate for the loss of water in the Caspian Sea could be to decrease the amount of water from the river used for agriculture and electricity.[15] However, this approach, while potentially mitigating the Caspian Sea crisis, would create new problems, namely food- and energy security threats to multiple Russian cities. This circumstance is further complicated by recent announcements that the Volga is experiencing excessive water level fluctuations, characterized by significant decreases in its water level.



Comparison of water levels in the Aral Sea in 1989 (left) and 2014 (right). Source: NASA.

As was the case with the Aral Sea, the dropping water levels in the Caspian will have far-reaching consequences. Beyond reducing the region's economic productivity and biodiversity, the shrinking of the Aral Sea negatively affected public health and regional agriculture. Though the Caspian Sea's outlook may not be as dire as that of its smaller cousin to the northeast, current projections should be a serious cause for concern. Decreases in Caspian Sea levels are also likely to have unforeseen effects on the region's climate and could potentially reach far beyond the Caspian littoral states. Therefore, it is critical that countries in the region and beyond come together to develop mitigation strategies to alleviate adverse effects.

Recommendations:

1. **Take Action to Mitigate Water Loss.** While little can be done by the Caspian countries alone to control climate change patterns behind water evaporation, establishing and maintaining water conservation practices should be a priority in alleviating the current crisis. For example, adhering to sustainable irrigation levels on the Ural and Volga rivers as well as installing more effective water pollution control and monitoring techniques and technologies are critical.
2. **Foster Regional Dialogue and Research the Problem**. As there is still little awareness among the littoral states of the severity of the problem, it is important to foster a regional dialogue among the affected countries and initiate deeper collaborative research on ways to effectively deal with the issue through data sharing, monitoring, and exchange of expertise. That dialogue and research cooperation should include all members of the region.
3. **Engage the International Community**. It is equally important to engage the international community in this conversation. The United States and Europe, for example, can provide their scientific expertise and technical assistance to help mitigate the growing threats posed by the declining water levels. Should the crisis continue as projected, its implications will reach far beyond the Caspian shores. International actors should also assist with establishing working groups that would examine the problem in more detail and produce relevant policy recommendations. One organization that can take up a leadership role in confronting the crisis of falling Caspian Sea levels is the Ashgabat-based United Nations Regional Centre for Preventive Diplomacy in Central Asia (UNRCCA). UNRCCA has played a prominent role in promoting sustainable water use in Central Asia since its inauguration in 2007 and could be an important convener in this new challenge.

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