

The Weaponization of Water: Environmental Policy as a Tool of Russian Hybrid Warfare in the Caspian Sea

<https://doi.org/10.31713/MCIT.2025.001>

Fuad Chiragov

National Defense University of Azerbaijan
Baku, Azerbaijan
chiragovfuad@gmail.com

Abstract — This article analyzes the Russian Federation's strategic weaponization of environmental policy in the Caspian Sea region as a sophisticated, non-kinetic instrument within its general hybrid warfare strategy. Avoiding the general assumption of environmental degradation as a byproduct of war, this analysis assumes that Russia is taking conscious measures in applying natural resources and environmental disasters as an heterogenous policy to accomplish political and economic objectives. By dominating the Caspian's principal water source, the Volga River, Moscow acquires the ability to inflict disproportionate, cumulative harm on the economies and legitimacy of governments of littoral states—specifically Kazakhstan, Azerbaijan, Turkmenistan, and Iran—without crossing the threshold of formal armed conflict. This piece outlines the mechanisms of this weaponization of the environment in physical and economic arguing that it is a central and expanding frontier of international competition, a key challenge to traditional understandings of national security.

Keywords—*Hybrid warfare, environmental weaponization, Volga River, Caspian Sea, non-kinetic instruments, hydropolitical leverage*

Introduction

The traditional concern of national security, which has long been preoccupied with seeming and tangible military threats, is being fundamentally disrupted by the intensifying convergence of geopolitical competition and the accelerating ecological shift. The imperative of this shift is underscored by the experience of national policymakers directly confronting these forces. For instance, last September, Azerbaijani President Ilham Aliyev, addressing the UN General Assembly, reported that the Caspian Sea was drying up very fast, stating that the main reason is not global warming and that the regional ecology is becoming a great security concern [6]. It is not coincidence that immediately after the Second Karabakh War, Azerbaijan hosted COP-29 signifying the increased strategic importance of environmental security.

Within the broader context of hybrid war—having as its hallmark the combined use of non-kinetic capabilities to attack the vulnerability of an adversary—the environmental sphere provides a unique operational environment. Hybrid threats are distinguished by co-ordinated action aimed at attacking systemic vulnerabilities, operationally existing in the "grey zone"

short of declared armed conflict. The environmental sphere is best suited for this kind of conflict on account of its complexity, protracted character, and intrinsic connection to matters of vital national interests such as food and water security.

The central argument of this analysis is that Russia uses the environmental domain to pursue its main hybrid warfare goal of destabilizing the legitimacy and functional capacity of Caspian littoral nations. This article argues that Russia is strategically recalibrating the environmental threat of the Caspian Sea's shrinking from a basic threat multiplier to an immediate, low-attribution vehicle of coercive power and system destabilization. It is not a case of environmental degradation as a consequence of war but an instance of investigating intentional, conscious methods where natural resources are used as a tool of statecraft, at times divorced from actual ecological concerns. [12, 14].

Russian political interests are underpinned by the settled intentionality of regulation of flow for national priorities, announcement of unilateral legal jurisdiction, and official public accusations from Kazakhstan, Azerbaijan, and Iran. As global environmental changes actively shape power balances, the Caspian Sea crisis demonstrates how these "actorless challenges" become reshaped from passive security multipliers into active agents of strategic influence.

A. THEORETICAL FRAMEWORK OF HYBRID WARFARE IN THE ENVIRONMENTAL DOMAIN

Hybrid conflict is a complex mixing or blending of conventional military force with unconventional instruments of subversion. It is defined by the widespread and synchronized use of non-kinetic operations, from economic pressure to cyber operations, diplomatic coercion, and increasingly, manipulation of the natural environment. Ultimately the larger strategic objective of hybrid war is political, subverting the legitimacy and capability of an intended target state to act. By systematically eroding the social compact which binds the state and its people together, hybrid actors diminish the basis of public trust. [8, 13].

In practical terms, hybrid activity occurs in the contested "grey zone," a phenomenon that is understood as a continuum ranging from peaceful influence through various forms of interference up to war. The current situation where environmental challenges are described in the collective sense as "actorless" benefits the hybrid

actor as ambiguity becomes a source of power. Environmental change can significantly damage and compromise the economy, political stability, or resource base of a country. These kinds of environmental challenges act as vulnerability multipliers and may escalate danger in the domains of food security, energy shortages, and land conflicts. By meaningfully integrating strategic policy manipulation with the backdrop of seemingly inevitable climate change, perpetrators can deliberately deny and avoid from responsibility. The diffusion of lines informs the instability with a natural or incidental quality that meaningfully prevents the establishment of retaliatory or preventative counter-responses. [3, 11].

The Geopolitics of Caspian Sea Crisis

With its colossal hydrocarbon resources, the Caspian Sea is also on a geopolitically crucial crossroads and alternative transport routes—such as the East-West which is known as Middle Corridor and the North-South Corridor. Over 10 million livelihoods depend on this world's largest enclosed inland water body in fragile balance of nature. The crisis with historically low water level has started to aggravate geopolitical tensions among the Caspian littoral states. Sea level has been in constant decrease with extremely accelerated intensity over the last decades, already becoming a record low. Projections forecast another drop of 9 to 18 meters by the close of the 21st century, reducing the surface area of the sea by 25%. [1].

Its primary causes are increased evaporation with increased temperature and decreased inflows from the rivers, primarily the Volga River, which contributes some 80% of the sea's water [2, 5]. Technologically the Volga is a Russian river and has only Moscow as the only sovereign steward of the lifeline of the Caspian Sea. The enormous structural reliance of the whole basin on the Volga River places the water security of the entire region under Russian decision-making.

The impact is deep and serious. The disintegrating coast and receding water level are making it hard for ships and tankers to reach such principal ports as Baku (Azerbaijan), Aktau (Kazakhstan), and Turkmenbashi (Turkmenistan), necessitating expensive and constant dredging. For offshore production, the falling water levels threaten to strand facilities, like Kazakhstan's multibillion Kashagan oil field, high on dry land onshore, and these need expensive, and complicated re-engineering. The steady deflation interferes with operations and transport, and export and hydrocarbon production become more burdensome and costly, threatening most of the region's economy.

II. MECHANISMS OF ENVIRONMENTAL WEAPONIZATION IN THE CASPIAN

The implementation of environmental weaponization by Russia relies on a carefully coordinated set of non-kinetic tactics executed across strategic domains, designed to leverage ambiguity and maximize long-term systemic damage.

Hydropolitical Leverage and Control

The legal imbalance which grants Russia the capability to apply leverage through its unilateral management of

the Volga River turns standard state resource administration into an ongoing instrument of geopolitical domination. [10]. Russia does not even have to make explicit threats to shut off the water supply, its mere continuance of the legal status quo, when it puts domestic objectives first, is sufficient leverage. Hence, other coastal nations cannot even demand from Russia for water management legally they only can bargain and ask for the cooperation on this problem.

The Russian officials publicly acknowledge directing flows for local commercial and ecological uses, so as to facilitate spawning of commercially relevant sturgeon in valuable habitats of the Astrakhan region. This policy decision, one which benefits profitable domestic commercial fishing interests to the detriment of downstream Caspian health, is interpreted as a politically driven disregard for regional stability and sovereign interests of the other four littoral states.

This advantage of Russia is agonizingly magnified by the escalating climate crisis. While climate change is a main reason for the sea level reduction, the ecological uncertainty generated by this same aftereffect exponentially increases the strategic value of the Volga water under Russian control. As the globe warms Russia is not missing this opportunity to weaponize the ecological disaster through controlling the critical relief valve, thereby making its hydropolitical advantage increasingly stronger in the region where it has geopolitical ambitions.

Other Caspian countries have complained about politically motivated flow reduction. The head of Iran's Department of Environment, Ali Salajegheh, issued a rare public declaration that the "closure of important gates to the Caspian Sea" and thus the Volga River is a main cause of the crisis. In Kazakhstan, the diplomatic strain arose following parliamentary hearings of the Volga's flow ahead of a resignation by a deputy water resources minister, pointing to the geopolitical nature of this issue. [7].

Inflicting Structural Economic Damage

The most immediate victim of the ecological catastrophe which is weaponized by Russia is Kazakhstan. Between 2001 and 2022, the northeastern Caspian surface of the Kazakh shoreline shrunk by 39%, while the shoreline receded by up to 37.25 kilometers.

This physical degradation directly affects radical national economic exposure of Kazakhstan whose energy complex rests on the large hydrocarbon projects like the Kashagan oil field. Water levels have dropped so significantly that support vessels can no longer safely reach the drilling rigs, jeopardizing the operational viability of the entire facility. Also, the key logistic hubs, such as seaports Aktau and Kuryk, which are essential for integration into strategic corridors such as China's Belt and Road Initiative, are taking costly emergency action to reroute logistics and adapt infrastructure.

The damage to infrastructure for these essential assets itself reinforces Russian economic dominance. The increased operational risk to the Volga River due to either climate or policy induced sea level drop makes foreign investment in Kazakhstan less attractive and adds complexity to regulatory compliance.

Consequently, the uncertainty pushes Kazakhstan, de facto, to rely on Russian controlled export pipelines, namely the Caspian Pipeline Consortium (CPC). By restricting the necessary flow from the Volga River to ensure safe navigation and operations, Russia indirectly counters Kazakhstan's policy seeking economic diversification and independence without imposing direct economic sanctions.

Overt Political Pressure and Energy Obstruction

Russian politicians, propagandists and prominent members of the ruling United Russia party regularly make blatant statements denying statehood and sovereignty of the former Soviet states affirming Russian proprietorship over their territories. Their rhetoric is designed to maintain an ever-present state of political instability, reminding the former Soviet states of their vulnerabilities.

The open and overt political pressure are reinforced by structural economic levers. Russia actively uses its geopolitical influence to encircle the economic autonomy of neighbors by closing alternative energy corridors. One such target is the potential Trans-Caspian gas pipeline, which might be crucial not only to Turkmenistan and Azerbaijan but also energy security of the European continent. Moscow uses voiced environmental concerns over the pipeline's potential effect as a club to possibly "freeze the whole project," in effect exercising a geopolitical veto over its neighbors' energy infrastructure development. This kind of obstructionist demand prevents the formation of coherent regional energy policies that bypass Moscow, making Russia the unavoidable transit point. The strategy maintains strategic fragmentation among the littoral states, retaining Russia its position as the unavoidable security and energy intermediary for the region.

III. STRATEGIC RATIONALE AND OBJECTIVES

The documented statements and actions reveal a consistent strategic rationale for Russian motives in the Caspian Sea, which aligns perfectly with the goals of hybrid warfare:

Maintain Economic Dominance.

Russia aims to maintain its monopoly on regional energy transport by preventing alternatives, such as the Trans-Caspian pipeline, and allowing the environmental catastrophe to devastate the logistical viability of competing non-Russian export routes (e.g., the Middle Corridor through the Caspian Sea). By disrupting or dismantling the infrastructure of its competitors, it ensures constant dependence on its transport networks.

Impose Political Subordination

Moscow is implementing a "pincer strategy." Open threats to sovereignty among former Soviet littoral states create a climate of political instability, while more subtle actions, such as dominance over the flow of the Volga, secure lasting, systemic dependence on Russia. The goal is less direct territorial control than to establish a relationship of subordination, rendering governments more compliant when negotiating basic questions of structural dependence.

Hybrid environmental warfare is designed to be long-lasting by imposing sustained liability on the target state. Unlike conventional destruction, damage to key environmental infrastructure, such as croplands or waterworks, necessitates astronomically expensive and long-term cleanup and rebuilding. This again maximizes destabilization beyond the conflict, ensuring that the attacked society remains physically, psychologically, and economically weak - and diverts critical resources - thereby achieving the overarching hybrid purpose of destabilization in the absence of hostilities. [9].

CONCLUSION

Russia's activities represent an intricate and purposeful weaponization of environmental policy that goes beyond the traditional hybrid methods of cyber and information warfare. Russia has repurposed a commonplace ecological issue into a tool of powerful coercive action by exploiting its control of the Volga River as a mechanism to facilitate and extend the effects of a larger climatic crisis. This enables Russia to steadily undermine the economic viability, political stability, and legitimacy of its Caspian neighbors—Kazakhstan primarily, but Azerbaijan, Turkmenistan, and Iran as well—while also being able to do so with plausible deniability. The dynamics establish the validity of President Aliyev's call for international community and UN to act and statement regarding the importance of the ecology of the region as a top tier security threat mission that is, unavoidably and necessarily, nestled in the reality of diplomacy and geopolitics.

REFERENCES

- [1] A. Amangeldina, "Aral Sea Syndrome: Why Is the Caspian Sea Shrinking?", March 4, 2025, Carnegie Endowment, accessed September 29, 2025, <https://carnegieendowment.org/russia-eurasia/politika/2025/03/caspian-environment-crisis?lang=en>
- [2] A. Buber, M. Bolgov and V. Buber, "Statistical and Water Management Assessment of the Impact of Climate Change in the Reservoir Basin of the Volga-Kama Cascade on the Environmental Safety of the Lower Volga Ecosystem", April 4, 2023, MDPI, accessed September 29, 2025, <https://www.mdpi.com/2076-3417/13/8/4768>
- [3] C. M. Briggs, "Climate Change and Hybrid Warfare Strategies", December 2020, Journal of Strategic Security 13(4):45-57, accessed October 1, 2025, https://www.researchgate.net/publication/347699843_Climate_Change_and_Hybrid_Warfare_Strategies
- [4] D. Acemoglu, M. Golosov, A. Tsyvinski and P. Yared, "A Dynamic Theory of Resource Wars", The Quarterly Journal of Economics (2012)127, 283–331, accessed October 1, 2025, <https://economics.mit.edu/sites/default/files/publications/A%20Dynamic%20Theory%20of%20Resource%20Wars.pdf>
- [5] E. Safarov, S. Safarov and E. Bayramov, "Changes in the Hydrological Regime of the Volga River and Their Influence on Caspian Sea Level Fluctuations", June 20, 2024, MDPI, accessed September 29, 2025, <https://www.mdpi.com/2073-4441/16/12/1744>
- [6] Ilham Aliyev addressed 80th session of UN General Assembly, September 25, 2025, <https://president.az/en/articles/view/70187>
- [7] Iranian Official Blames Russia For Caspian Sea Water Reduction, August 7, 2023, Iran International, accessed September 29, 2025, <https://www.iranintl.com/en/202308071134>

Modeling, control and information technologies – 2025

[8] M. Bizzotto and A. Altomare, "Weaponization of Natural Resources" | The CoESPU MAGAZINE - the online quarterly Journal of Stability Policing" no. 2 - 2024, accessed October 1, 2025, <https://www.coespu.org/articles/weaponization-natural-resources>

[9] M. V. Kazemi, "The Negative Consequences of the Declining Water Level in the Caspian Sea", March 5, 2025, International Peace Studies Center – IPSC, accessed September 29, 2025, <https://peace-ipsc.org/2025/03/05/the-negative-consequences-of-the-declining-water-level-in-the-caspian-sea/>

[10] M. Schletterer, H. Middelkoop, S.I. Shaporenko, V.V. Kuzovlev, A.E. Minin, G.J. Van Geest, K. Górska, "The Volga: Management issues in the largest river basin in Europe", February 25, 2018, Wiley, accessed September 29, 2025, https://dspace.library.uu.nl/bitstream/handle/1874/381273/Schletterer_et_al_2019_River_Research_and_Applications.pdf?sequence=1

[11] Q. Vuong, V. La and M. Nguyen, "Weaponization of Climate and Environment Crises: Risks, Realities, and Consequences", 2023, OSF Preprints v9qrm, Center for Open Science, accessed October 1, 2025, <https://ideas.repec.org/p/osf/osfxxx/v9qrm.html>

[12] R. Ricci, "The Caspian Sea is drying up, and Kazakhstan asks Russia to collaborate in managing the Volga River", Materia Rinnovabile, accessed September 29, 2025, <https://www.renewablematter.eu/en/caspian-sea-drying-up-kazakhstan-russia-volga-river>

[13] T. Ide, M. F. Johnson, J. Barnett, F. Krampe, P. Le Billon, L. Maertens, ... I. Vélez-Torres, (2023). The Future of Environmental Peace and Conflict Research. *Environmental Politics*, 32(6), 1077–1103. <https://doi.org/10.1080/09644016.2022.2156174>

[14] Z. Shiriyev, "Russia's War in Ukraine Is Aggravating the Caspian Sea Environmental Crisis", July 23, 2024, Carnegie Endowment, accessed September 29, 2025, <https://carnegieendowment.org/russia-urasia/politika/2024/07/caspian-sea-ecology?lang=en>