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Addressing the Declining Water Level of the Caspian Sea from a Legal Perspective and a Proposal for a New Agreement

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Abstract: The Caspian Sea is currently experiencing a rapid decline in water levels, with a 46% reduction in water-covered area between 2001 and 2024. Considering the environmental and socio-economic impacts of the problem, legal responses remain fragmented. This article examines existing legal frameworks to determine why current instruments fail to mitigate the problem of water-level decline. This study employs a doctrinal and comparative legal analysis of the domestic legislations of the five Caspian littoral states, alongside a review of existing international agreements. The analysis reveals that current instruments are insufficient. Domestic legislation of the Caspian littoral states remains uneven and fragmented. Kazakhstan's Ecological Code serves as a notable model for integrating climate regulation and the response to the decline in water levels in the Caspian Sea into national legislation. While international agreements, such as the Tehran Convention, establish general cooperation principles, they lack binding rules for coordinated river-basin management and climate adaptation. Highlighting a recent surge in regional political will, this paper proposes a new agreement. The proposed agreement introduces binding obligations for reservoir release regimes, minimum environmental flows, and a permanent basin regulatory body. By shifting from ad hoc diplomacy to an integrated legal instrument, the proposal provides a plan for ensuring the socio-economic and environmental security of the Caspian region.

Keywords: Caspian Sea, water level management, water level decline, environmental law, legal response

1. Introduction

The Caspian Sea, being the Earth's largest inland water body, experienced a rapid decline in its water level in the 21st century. This decline poses a significant threat to the ecosystem and surrounding economies. Given the cultural and historical value of the Caspian Sea, its protection requires urgent legal action.

Declining water levels are not new for this region. In recent decades, the Aral Sea and Lake Urmia have experienced severe environmental crises. As one of the largest inland lakes in the 1960s, the Aral Sea underwent a catastrophic transformation by 2006, with its water level dropping by 23 m, surface area shrinking by 74%, and volume decreasing by 90%, mainly due to unsustainable irrigation projects and poor water management policies.[1] Lake Urmia shares a similar fate. Between 1970 and 1997, the decline in Lake Urmia's water level was relatively slow; however, from 1998 to 2018, the lake experienced

[1] Philip Micklin, "The Aral Sea Disaster," *Annual Review of Earth and Planetary Sciences* 35 (2007): 47, https://doi.org/10.1146/annurev.earth.35.031306.140120.

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rapid desiccation, resulting in approximately 30% reduction in its total area.[2] The cases of the Aral Sea and Lake Urmia highlight the environmental and socio-economic consequences of large-scale declines in water levels in the region.

Recent studies raised concerns about the drop in the Caspian Sea's water level, as well as its environmental and socio-economic consequences. According to Court *et al.* (2025),[3] between 2001 and 2024, the water-covered area of the Caspian Sea decreased by approximately 46%, with the shoreline retreating over 56 km (especially in the shallow northeastern area), causing severe threats to ecosystems, biodiversity, and coastal infrastructure, necessitating adaptive and transboundary management approaches. Another study[4] finds that between 1993 and 2001, the water level dropped at a rate of about 5.4 cm per year, accelerating to about 8.9 cm per year since 2005. The reasons behind the water level decline are complex, involving both natural and anthropogenic factors. Contrasting with today's downward trend, historical data highlights the Caspian's sensitivity to its drainage system, as the redirection of northern rivers and influx of glacial meltwater previously caused the sea to expand and connect with the Black Sea.[5] It has been demonstrated[6] that climate-driven changes in the Volga River's hydrology are the main cause of the Caspian Sea's water level drop. In addition, a study[7] finds that shifts in the Caspian Sea's wind regime have intensified evaporation and contributed to the decline in water levels. Further research[8] indicates that the Caspian Sea's seasonal circulation and water level changes are mainly caused by changes in winds, river discharge, and air-sea fluxes. In addition to natural causes, human activities such as dam construction, hydrocarbon extraction, and desalination projects have also played a major role in the decline of the Caspian Sea's water level.[9] Since the mid-20th

2 Mehri Shams Ghahfarokhi and Sogol Moradian, "Investigating the Causes of Lake Urmia Shrinkage: Climate Change or Anthropogenic Factors?," *Journal of Arid Land* 15, no. 4 (2023): 424, https://doi.org/10.1007/s40333-023-0054-z.

3 Rebecca Court et al., "Rapid Decline of Caspian Sea Level Threatens Ecosystem Integrity, Biodiversity Protection, and Human Infrastructure," *Communications Earth & Environment* 6 (2025): 261, https://doi.org/10.1038/s43247-025-02212-5.

4 Jianli Chen et al., "Caspian Sea Level Change Observed by Satellite Altimetry," *Remote Sensing* 15, no. 3 (2023): 703, https://doi.org/10.3390/rs15030703.

5 Sifan A. Koriche et al., "What Are the Drivers of Caspian Sea Level Variation during the Late Quaternary?," *Quaternary Science Reviews* 283 (2022): 107457, https://doi.org/10.1016/j.quascirev.2022.107457.

6 Elnur Safarov, Said Safarov, and Emil Bayramov, "Changes in the Hydrological Regime of the Volga River and Their Influence on Caspian Sea Level Fluctuations," *Water* 16, no. 12 (2024): 1744, https://doi.org/10.3390/w16121744.

7 Elnur Safarov et al., "Impact of Changes in the Wind Regime on the Caspian Sea Level Fluctuation and Its Relationship with SOI and NAO," *Scientific Reports* 15 (2025): 36380, https://doi.org/10.1038/s41598-025-20346-6.

8 Rashit A. Ibrayev et al., "Seasonal Variability of the Caspian Sea Three-Dimensional Circulation, Sea Level and Air-Sea Interaction," *Ocean Science* 6, no. 1 (2010): 311–29, https://doi.org/10.5194/os-6-311-2010.

9 Aida Amangeldina, "The Caspian Sea is Under Threat of Desertification: What Are the Causes and Consequences?," Central Asia Climate Information Portal, November 12, 2024, accessed March 19, 2026, https://centralasiaclimateportal.org/publications/the-caspian-sea-is-under-threat-of-desertification-what-are-the-causes-and-consequences.

century, the Caspian Sea's long-term water decline has been partly driven by human activities that reduce the freshwater entering the basin, in addition to climate-related changes in evaporation and precipitation.[10] Furthermore, shipping operations and weak enforcement of environmental regulations have intensified emissions, pollution, and evaporation, contributing to the drop in water levels.[11] These factors led to a decline in the Caspian Sea level, raising serious concerns about its future. Further research[12] predicts that, due to climate change and increasing evaporation, the water level will drop by up to about 14 m by 2100, causing major ecological and economic impacts even under low-carbon emission scenarios.

Despite growing concern, a limited number of papers have explored clear policy and legal solutions to the Caspian Sea's environmental challenges. UNEP working paper[13] warns of the rapid decline of the Caspian Sea and urges coordinated scientific research, transboundary adaptation planning, and institutional cooperation among all Caspian littoral states to protect coastal ecosystems and infrastructure from the impacts of water-level decline. According to another policy brief,[14] addressing the Caspian Sea's declining water level requires coordinated regional water-conservation efforts, scientific cooperation, and active engagement of the international community. Further study[15] recommended regional cooperation on scientific monitoring, water management, and legal adaptation to mitigate the decline in water levels.

Addressing the crisis of declining Caspian Sea water levels requires more than just scientific monitoring and research; it requires a unified legal response. This study fills this gap by analyzing the domestic legislative frames of Caspian littoral states and international legal instruments to identify systemic gaps. Ultimately, it proposes a new international agreement designed to harmonize regional efforts and mitigate both anthropogenic and natural factors.

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10 Hamid Lahijani et al., "Caspian Sea Level Changes during Instrumental Period, Its Impact and Forecast: A Review," *Earth-Science Reviews* 241 (2023): 104428, https://doi.org/10.1016/j.earscirev.2023.104428.

11 Black Sea Institute, "Aral Sea Syndrome: Why Is the Caspian Sea Shrinking?," August 21, 2024, accessed March 19, 2026, https://blacksealaw.org/aral-sea-syndrome-why-is-the-caspian-sea-shrinking/.

12 Rohit Samant and Matthias Prange, "Climate-Driven 21st Century Caspian Sea Level Decline Estimated from CMIP6 Projections," *Communications Earth & Environment* 4, no. 1 (2023): 297, https://doi.org/10.1038/s43247-023-01017-8.

13 United Nations Environment Programme, "Caspian Sea Fluctuations and Climate Change" (Working Paper, UNEP DHI Partnership – Centre on Water and Environment, Nairobi, 2024), https://unepdhi.org/wp-content/uploads/sites/2/2024/11/Caspian_Sea_working_paper.pdf.

14 Allan Mustard, Aizhan Abilgazina, and Akbota Karibayeva, *The Silent Threat of Falling Caspian Sea Levels: A Caspian Policy Center Policy Brief* (Washington: Caspian Policy Center, 2021), https://api.caspianpolicy.org/media/ckeditor_media/2021/11/04/the-silent-threat-of-falling-caspian-sea-levels.pdf.

15 Rodrigo Labardini and Nazrin Baghirova, *Desiccation in the Caspian Sea: On the Need to Implement Domestic and Regional Countermeasures, Analytical Policy Brief* (Baku: Institute for Development and Diplomacy, 2023), https://idd.az/media/2024/01/12/idd_policy_brief_-_labardini-baghirova_22_december.pdf?v=1.1.

2. Materials and Methods

The main thesis of this article is that the existing national and international legal frameworks are insufficient to address the crisis of the Caspian Sea's water level decline. Therefore, a unified and legally binding international agreement is necessary. To test this thesis, this study employs a combination of doctrinal and comparative legal analyses. The research is structured into three phases: an evaluation of domestic legislation across littoral states, an assessment of existing international legal instruments and the formulation of a *de lege ferenda* proposal for a new regional agreement.

The comparative legal analysis focuses exclusively on the five littoral states of the Caspian Sea: Azerbaijan, Russia, Kazakhstan, Turkmenistan, and Iran. This scope is deliberately restricted to these nations because they hold exclusive sovereign rights, jurisdiction and the primary legal burden for environmental protection within their respective sectors under the international agreements. While international rivers significantly impact the sea's volume, the legal mandate to establish a unified policy rests strictly with the littoral states.

To move beyond a general description of foreign legal acts, this study evaluates the domestic legal frameworks of the littoral states against a specific catalog of regulatory factors. The analysis investigates how each national system addresses the following legal factors: constitutional and general environmental frameworks, water management, climate regulation, and implementation challenges. This factor-based approach allows the comparative analysis to function not only as a descriptive survey of foreign legal orders, but as a diagnostic tool identifying which regulatory elements are present, absent, or underdeveloped across the littoral states and which national models are most suitable as patterns for the proposed agreement.

The primary sources of this research include: national legislation (official legal acts taken from platforms such as "e-qanun.az," "adilet.kz," "consultant.ru," "minjust.gov.tm"), international legal instruments (such as agreements, conventions, memoranda), and decisions of international courts (such as Pulp Mills on the River Uruguay [Argentina v. Uruguay; 2010] and Gabčíkovo-Nagymaros Project [Hungary v. Slovakia; 1997]). Secondary sources include scientific research papers, policy documents and earth science literature on Caspian hydrological dynamics.

The study acknowledges limitations in the accessibility of updated legal regulations in certain jurisdictions (especially Iran) and in relying on translations of national legal acts.

3. Results and Discussion

3.1. Analysis of National Legal Frameworks

This section analyzes the legal dimensions of the Caspian Sea's water level decline by examining how existing national legislative frameworks regulate the natural and anthropogenic drivers of the crisis. While all littoral states possess foundational environmental laws, their approaches to climate regulation and water management vary in scope and enforceability.

3.1.1. The Republic of Azerbaijan

The Constitution[16] plays a role in Azerbaijan's legislative framework primarily by setting the general principles and key objectives for environmental regulation. Article 39 establishes the right to a healthy environment and mandates the state to maintain ecological balance, while Article 78 enshrines the duty to protect the environment.

The central legislative act is the Law "On Environmental Protection."[17] While it addresses broad concepts, such as ecological balance and economic protection tools, it lacks specific enforcement mechanisms for climate regulation. Notably, Article 49 ("Protection of the Climate and Ozone Layer") functions as a declarative provision, deferring to international agreements rather than establishing domestic obligations. Similarly, while the Law "On the Protection of Atmospheric Air" prohibits projects damaging to the climate, it fails to define specific criteria for what constitutes "damage." Further laws on "On the Use of Renewable Energy Sources in the Production of Electric Energy," "On Energy," and "On Electro-energy" include provisions to promote renewable energy sources and reduce greenhouse gas emissions, without setting clear obligations.

The Water Code[18] designates the Azerbaijani sector of the Caspian Sea as part of the State Water Fund (Article 5). However, it does not establish a dedicated regulatory regime for the Caspian Sea; instead, it relies on general national acts. Although the "National Strategy on the Efficient Use of Water Resources"[19] obligates authorities to evaluate climate impacts on the Caspian, Azerbaijan currently lacks a dedicated climate law,[20] addressing the issue primarily through non-binding policy strategies.

3.1.2. The Russian Federation

Russia is a Caspian littoral state that controls the Volga River, the primary water source of the Caspian Sea. Therefore, the analysis of its legislation is crucial. The Constitution (1993) establishes the right to a favorable environment (Article 42) and the obligation to preserve natural wealth (Article 58)[21] of the Russian Federation, and determines the right to a favorable environment as a human right. Furthermore, Article 58 obligates people to preserve nature and the environment, and to carefully manage natural resources.

The Federal Law "On Environmental Protection"[22] (2002) serves as the core framework. While it sets standards for monitoring and liability, it does not specifically include

16 Constitution of the Republic of Azerbaijan (1995), https://e-qanun.az/framework/897.

17 Law of the Republic of Azerbaijan No. 678-IQ "On Environmental Protection" (1999), https://e-qanun.az/framework/3852.

18 Water Code of the Republic of Azerbaijan (1997), https://e-qanun.az/framework/46940.

19 National Strategy on the Efficient Use of Water Resources (2024), https://e-qanun.az/framework/58119.

20 Emin Alimusayev, "Analysis of Legal Challenges in Climate Regulation of Azerbaijan and Proposal for Climate Law," *Law. Human. Environment* 16, no. 4 (2025): 42–58, https://doi.org/10.31548/law/4.2025.42.

21 Constitution of the Russian Federation (1993), https://www.constitution.ru/en/10003000-01.htm.

22 Federal Law of the Russian Federation No. 7-FZ "On Environmental Protection" (2002), https://www.consultant.ru/document/cons_doc_LAW_34823/.

climate regulation. Water management is governed by the Water Code,[23] which establishes "basin districts" (Article 28) and mandates "schemes of complex use" (Article 33). Crucially, Article 45 regulates reservoir operations. While the legal basis for monitoring exists, the framework is often criticized for ineffectiveness. According to Sivakov[24] (2020), gaps in the legal framework enable corrupt practices that hinder the preservation of water bodies. Another research analyzed how ecosystem services are currently neglected in Russia's water policy and argues for their institutionalization to address environmental problems.[25] Furthermore, Venitsianov (2019) noted that key challenges in Russian water protection include ineffective wastewater treatment, deteriorated monitoring systems, outdated legislation, and a failure to transition to the best available technologies.[26]

Regarding climate, Russia adopted the Federal Law "On Limiting Greenhouse Gas Emissions"[27] in 2021. However, it is often criticized for lacking clarity, being vague, and framework-based.[28] Further research refers to Russia's climate legislation as "climate obstructionism."[29] According to another article, the absence of a comprehensive climate law in Russia undermines effective climate governance, necessitating the adoption of a strong climate law.[30]

3.1.3. The Republic of Kazakhstan

Kazakhstan represents the most advanced legislative model among the littoral states. The Constitution (Articles 31 and 38)[31] establishes the foundation, which the 2021 Ecological Code operationalize.[32]

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23 Water Code of the Russian Federation No. 74-FZ (2006), https://www.consultant.ru/document/cons_doc_LAW_60683/.

24 Dmitry O. Sivakov, Viacheslav V. Sevalnev, and Yuri V. Truntsevsky, "Use and Protection of Water Bodies: Corruption Cases," *E3S Web of Conferences* 203 (2020): 02016, https://doi.org/10.1051/e3sconf/202020302016.

25 Timofey D. Moiseev and Sofia T. Garipova, "Water Use and Ecosystem Services: A Case of Russia," *Environmental Dynamics and Global Climate Change* 13, no. 2 (2022): 60–69, https://doi.org/10.18822/edgcc105930.

26 Yevgeniy V. Venitsianov, "Modern Problems of Water Protection in Russia," *IOP Conference Series: Earth and Environmental Science* 321 (2019): 012033, https://doi.org/10.1088/1755-1315/321/1/012033.

27 Federal Law of the Russian Federation No. 296-FZ "On Limiting Greenhouse Gas Emissions" (2021), https://www.consultant.ru/document/cons_doc_LAW_388992/.

28 Natalia G. Zhavoronkova and Vyacheslav B. Agafonov, "The Role of National Climate Law in Ensuring the 'Energy Transition,'" *Lex Russica* 17, no. 2 (2022): 151–62, https://doi.org/10.17803/1994-1471.2022.135.2.151-162.

29 Marianna Poberezhskaya and Ellie Martus, "Climate Obstruction in Russia: Surviving a Resource-Dependent Economy, an Authoritarian Regime, and a Disappearing Civil Society," in *Climate Obstruction across Europe*, eds. Robert J. Brulle, J. Timmons Roberts, and Miranda C. Spencer (New York: Oxford University Press, 2024), 214–42, https://doi.org/10.1093/oso/9780197762042.003.0009.

30 Aleksey Anisimova, Yulia Isakova, and Olga Volkonskaya, "Trends and Prospects for the Formation of a National Model of Climate Legislation (Using the Russian Federation as an Example)," *Vniversitas Jurídica* 74 (2025), https://doi.org/10.11144/Javeriana.vj74.tpfn.

31 Constitution of the Republic of Kazakhstan (1995), https://adilet.zan.kz/eng/docs/K950001000_.

32 Environmental Code of the Republic of Kazakhstan No. 400-VI (2021), https://adilet.zan.kz/eng/docs/K2100000400.

Unlike its neighbors, Kazakhstan's Ecological Code includes a dedicated Chapter 19 regarding the Northern Caspian Sea. Recognizing that this shallow zone is most vulnerable to water-level decline, the Code establishes a "State Conservation Area" with strict prohibitions on destructive activities such as water discharge and polluting construction. Furthermore, Chapter 20 integrates climate change directly into national law, establishing carbon budgeting, quota-trading systems, and a target to reduce emissions by 15% by 2030.

In 2025, Kazakhstan further strengthened its regime with the adoption of a new Water Code,[33] which introduces the concept of "water security" into national legislation.[34] A key innovation is Article 39, which defines "ecological runoff" as a mandatory proportion of river runoff intended to preserve river, lake, and marine ecosystems, and to be left in nature. It emphasizes ecological runoff as a priority that must be respected. The Code mandates comprehensive water planning, requiring both national and river-basin management plans. Chapter 2 is dedicated to the water sector's adaptation to climate change. This chapter establishes a system for preventing and managing floods and other harmful water-related effects, and defines drought adaptation measures, including monitoring, alternative water sources, and water conservation and storage. Despite these robust laws, challenges remain. According to the UNDP article[35] (2025), fragmented governance remains the biggest obstacle in Kazakhstan's water management. Furthermore, Sopykhanova *et al.* (2023) examine how legal regulation and state policy in Russia and Kazakhstan remain fragmented and insufficiently aligned with the United Nations 2030 Agenda for Sustainable Development, particularly in environmental protection and natural-resource management.[36]

3.1.4. Turkmenistan

The Constitution of Turkmenistan guarantees the right to a healthy environment and obliges the state to ensure the sustainable use of resources.[37] The Law "On Nature Preservation"[38] addresses climate protection in Article 47, setting objectives to stabilize greenhouse gas concentrations. While there is currently no dedicated climate law, a draft "Law on Climate Change" was presented in 2025.[39]

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33 Water Code of the Republic of Kazakhstan No. 178-VIII (2025), https://adilet.zan.kz/eng/docs/K2500000178.

34 Uchet.kz, "New Water Code Entered into Force," June 10, 2025, accessed March 19, 2026, https://uchet.kz/news/novyy-vodnyy-kodeks-vstupil-v-silu/.

35 Yerassyl Kalikhan, "Water Management in Kazakhstan: A Systems Approach for a Secure Future," United Nations Development Programme, March 18, 2025, accessed March 19, 2026, https://www.undp.org/kazakhstan/blog/water-management-kazakhstan-systems-approach-secure-future.

36 Assel Sopykhanova et al., "Problems of Legal Regulation and State Policy Measures Related to Nature Management in the Framework of Achieving the SDGs: Examples from Russia and Kazakhstan," *Sustainability* 15, no. 2 (2023): 1042, https://doi.org/10.3390/su15021042.

37 Constitution of Turkmenistan (2016), https://minjust.gov.tm/ru/hukuk/merkezi/hukuk/1.

38 Law of Turkmenistan "On Nature Protection" (2014), https://minjust.gov.tm/ru/hukuk/merkezi/hukuk/154.

39 State News Agency of Turkmenistan, "Presentation of the Draft Law 'On Climate Change' Was Held in Ashgabat," Turkmenistan: Golden Age, June 6, 2024, accessed March 19, 2026, https://aarhusashgabat.org/blog/v-ashhabade-sostoyalas-prezentacziya-zakonoproekta-ob-izmenenii-klimata/.

The Water Code[40] includes the Turkmen sector of the Caspian Sea in the State Water Fund, but lacks specific provisions for managing water-level fluctuations. International observers note a significant gap between policy and practice. According to the UN Economic Commission, weak enforcement of existing laws remains one of the biggest challenges in Turkmenistan's environmental legislation. In addition, the NAP Global Network[41] highlights the absence of a permanent technical secretariat and a formal legal framework to systematically mainstream adaptation priorities into sectoral planning, particularly within the water and agriculture industries, which remain the biggest obstacles to Turkmenistan's climate regulation. Further research[42] identifies significant gaps between Turkmenistan's high-level climate strategies and the specific regulatory mechanisms needed for effective enforcement on the ground.

3.1.5. The Islamic Republic of Iran

Iran's Constitution (Article 50)[43] declares environmental protection a public duty and strictly prohibits activities that cause irreparable damage. While Iran lacks a dedicated climate law, it adopted a "National Climate Change Management Plan" in 2025 to bridge this gap, though scholars continue to call for binding legislation.[44]

Water regulation is regulated by the Water Law[45] and the Law on Equal Distribution of Water.[46] While these laws do not include specific provisions on the Caspian Sea's water level, Voynova (2023) notes that Iran's environmental legislation has gradually evolved into a comprehensive framework aimed at protecting the Caspian Sea's water resources, biodiversity, and marine environment across six historical stages.[47] Furthermore, corruption and weak enforcement of laws hinder the effectiveness of water regulation in Iran.[48]

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40 Water Code of Turkmenistan (2016), https://minjust.gov.tm/ru/hukuk/merkezi/hukuk/527.

41 Bunafsha Mislimshoeva et al., *Institutional Analysis of the Current National System and Processes Related to Climate Change in Turkmenistan* (International Institute for Sustainable Development, 2021), https://napglobalnetwork.org/wp-content/uploads/2021/06/napgn_en_2021_institutional-analysis-of-the-current-national-system-and-processes-related-to-climate-change-in-turkmenistan.pdf.

42 Yolbars Kepbanov, *Legal Protection of Climate in Turkmenistan: Assessment of the Current Situation and Development Prospects: Research Report in Sociology of Law*, 2023:4 (Lund: Lund University, 2023), https://www.researchgate.net/publication/375923460.

43 Constitution of the Islamic Republic of Iran (1979), https://www.shora-gc.ir/en/news/87/constitution-of-the-islamic-republic-of-iran-full-text.

44 Ali Khalili, "Climate Changes and Iran's 7th Development Plan at a Glance," *Journal of Agricultural Meteorology* 11, no. 2 (2023): 1–3, https://doi.org/10.22125/agmj.2023.186488.

45 Iran Water Law and the Manner of Water Nationalization (1968), https://www.cawater-info.net/bk/water_law/pdf/iran1968.pdf.

46 Law of Fair Water Distribution (1982), https://fa.wikisource.org/wiki/Law_of_Fair_Water_Distribution.

47 Maria V. Voynova, "Main Stages of Developing Environmental Legislation of Islamic Republic of Iran on Environmental Protection of Caspian Sea," *Oil and Gas Technologies and Environmental Safety* 2 (2023): 69–82, https://doi.org/10.24143/1812-9498-2023-2-69-82.

48 Kamyar Kayvanfar, "Iran's Water Crisis: Historical Roots, Ideological Dimensions and Policy Challenges," ORF Middle East, November 12, 2025, accessed March 19, 2026, https://orfme.org/expert-speak/irans-water-crisis-historical-roots-ideological-dimensions-and-policy-challenges/.

Table. Comparative analysis of national legislations of Caspian littoral states

State	Key legislative acts	Primary legal challenges
Azerbaijan	The Constitution (Articles 39, 78); The Water Code; Law "On Environmental Protection."	No dedicated laws on climate or the Caspian Sea water level decline; vague provisions.
Russia	Constitution (Articles 42, 58); Federal Law "On Environmental Protection"; The Water Code Federal Law N296-FZ "On Limiting GHG Emissions."	Legislation is framework-based and lacks clarity on enforcement; deteriorated monitoring systems; gaps enable corrupt practices.
Kazakhstan	Constitution (Articles 31, 38); The Ecological Code; The Water Code.	Fragmented regulation.
Turkmenistan	Constitution (Articles 15, 53); Law on Nature Preservation; The Water Code; Draft Law "On Climate Change."	Institutional void; enforcement gap.
Iran	Constitution (Article 50); National Climate Change Management Plan; Water Law; Law on Equal Distribution of Water.	No dedicated climate law exists; general water laws do not include specific provisions addressing fluctuations in the Caspian water level; corruption and weak enforcement hinder the effectiveness of existing environmental frameworks.

Source: systematized by the author.

3.2. Legal Status of the Caspian Sea and Environmental Regulation Agreements

Historically, the Caspian Sea was regulated by bilateral agreements between Persia and the Russian Empire. With the collapse of the Soviet Union in 1991, three new littoral states emerged. As Azerbaijan, Kazakhstan, and Turkmenistan regained their independence, debates on the legal nature of the Caspian Sea were sparked. Due to the different interests of the littoral states, total consensus was not easily reached. In the early stages of discussions, northern states signed a series of bilateral agreements.

The existing legal framework of the Caspian Sea rests on two distinct pillars: the 2018 Convention,[49] which serves as a political constitution for legal status, and the 2003 Tehran Convention,[50] which serves as the primary environmental framework for ecological cooperation. In 2018, the Convention on the Legal Status of the Caspian Sea was signed by all littoral states. This Agreement created a *sui generis* legal status. The Convention divides the Caspian Sea into 15-mile sovereign territorial waters and 10-mile exclusive

[49] Convention on the Legal Status of the Caspian Sea, signed August 12, 2018, https://tehranconvention.org/system/files/web/convention_on_the_legal_status_of_the_caspian_sea_en.pdf.

[50] Framework Convention for the Protection of the Marine Environment of the Caspian Sea, signed November 4, 2003, https://tehranconvention.org/system/files/tc-interim-secretariat/tehran_convention_text_final_pdf.pdf.

fishing zones for each state, while treating the central water surface as a common area for navigation. For seabed and subsoil, delimitation into national sectors must be agreed upon by the states. Despite the Convention's provisions for the general protection of the environment, it does not specifically address the decline in water levels in the Caspian Sea. Furthermore, in scientific literature, this Agreement is often criticized for unresolved legal and practical questions that require further clarification and could lead to interstate tensions.[51]

The Tehran Convention, formally known as the Framework Convention for the Protection of the Marine Environment of the Caspian Sea, was adopted in 2003 and became enforceable in 2006. It is the first legally binding, multilateral environmental agreement among the five Caspian littoral states. It establishes a framework for preventing pollution, protecting biodiversity, and promoting regional cooperation. The Preamble of the Convention notes that the contracting parties are mindful of the dangers to the marine environment of the Caspian Sea and of its unique hydrographic and ecological characteristics, particularly in relation to sea level fluctuations. Article 3 defines the scope of the Convention, stipulating that it shall apply to the marine environment of the Caspian Sea, taking into account fluctuations in water levels and pollution from land-based sources. Article 11 states that the contracting parties shall take all appropriate measures to reduce the possible negative impact of anthropogenic activities aimed at mitigating the consequences of the sea level fluctuations on the Caspian Sea ecosystem. Furthermore, Article 16 of the Convention obligates the parties to collaborate on scientific research and practical measures to mitigate the environmental and socio-economic impacts of Caspian Sea level changes. However, despite the acknowledgment of the risk of water level fluctuations in the Convention, many of its obligations remain ambiguous, lacking concrete enforcement mechanisms, binding targets, and detailed implementation procedures. As a result, state compliance largely depends on political will, which has limited the Convention's effectiveness in addressing the accelerating environmental challenges facing the Caspian Sea. Moreover, given that climate-related factors largely drive contemporary Caspian Sea-level decline, the Convention lacks specific provisions addressing climate change impacts or adaptation measures, further limiting its practical effectiveness.

In 1994, the Coordinating Committee on Hydrometeorology and Pollution Monitoring of the Caspian Sea[52] (CASPCOM) was established by the littoral states. Its main purpose is to coordinate, standardize, and improve regional hydrometeorological research and pollution monitoring in the Caspian Sea. Furthermore, CASPCOM regularly issues bulletins[53] on the Caspian Sea water level. In 2013, the Memorandum of Understanding between CASPCOM and the interim Secretariat of the Tehran Convention was signed.

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51 Michał Pietkiewicz, "Legal Status of Caspian Sea – Problem Solved?," *Marine Policy* 123 (2020): 104321, https://doi.org/10.1016/j.marpol.2020.104321.

52 Coordinating Committee on Hydrometeorology and Pollution Monitoring of the Caspian Sea (CASPCOM), *Statute of the Coordinating Committee on Hydrometeorology and Pollution Monitoring of the Caspian Sea* (2025), http://www.caspcom.com/wp-content/uploads/2025/05/Statute_CASPCOM_eng.pdf.

53 Co-Ordination Committee for Hydrometeorology and Pollution Monitoring of the Caspian Sea (CASPCOM), *Information Bulletin on the State of the Caspian Sea Level No. 30* (2025), http://www.caspcom.com/wp-content/uploads/2025/12/CASPCOM-Bulletin-No.30.pdf.

The Memorandum is intended to facilitate cooperation in addressing the environmental challenges of the Caspian Sea, such as pollution, habitat loss, and the effects of climate change. In 2016, the Agreement on Cooperation in the Field of Hydrometeorology of the Caspian Sea was signed. It established a binding framework for cooperation among the five Caspian littoral states in the observation, monitoring, forecasting and exchange of hydrometeorological and environmental data related to the Caspian Sea.

In 2014, littoral states signed an agreement[54] on cooperation in cases of emergency. It aims to establish a cooperative framework for preventing and responding to natural and anthropogenic disasters in the Caspian Sea region. It establishes procedures for requests, transit, costs, liability, and operational cooperation, while respecting national laws and international obligations. Furthermore, in 2014, another Agreement[55] on the conservation and sustainable use of the Caspian Sea's aquatic biological resources was signed. This Agreement commits the five Caspian states to cooperate to conserve and sustainably use aquatic biological resources through ecosystem-based management, scientific research, data sharing, and combating illegal fishing, while enabling economic activities.

Beyond regional accords, the 1997 UN Convention on the Law of the Non-Navigational Uses of International Watercourses[56] provides a critical normative benchmark for the proposed agreement. Although the Caspian littoral states are not parties to this instrument, its core principles of "equitable and reasonable utilization" (Article 5) and the "obligation not to cause significant harm" (Article 7) represent customary international law.

Furthermore, international jurisprudence and general principles of international law offer essential precedents for managing shared water crises. The principle of good neighborliness obliges states to exercise their sovereign rights over shared natural resources in a manner that does not cause significant harm to neighboring states. For example, in the Pulp Mills on the River Uruguay (2010) case,[57] the International Court of Justice established that states sharing international waterways bear binding procedural obligations before authorizing activities capable of causing transboundary environmental harm. Similarly, the Gabčíkovo-Nagymaros Project (1997) ruling[58] emphasizes the need for sustainable development and ecological necessity when managing shared river systems. Integrating these judicial standards into the Caspian legal framework would provide the mechanisms currently missing from the Tehran Convention, ensuring that any anthropogenic activities affecting water levels are subject to rigorous, multi-state legal scrutiny.

54 Agreement on Cooperation in the Field of Prevention and Elimination of Emergency Situations in the Caspian Sea, signed September 29, 2014, https://e-qanun.az/framework/28996.

55 Agreement on the Conservation and Sustainable Use of Aquatic Biological Resources of the Caspian Sea, signed September 29, 2014, https://tehranconvention.org/system/files/web/bioresources_2014.pdf.

56 Convention on the Law of the Non-navigational Uses of International Watercourses, signed May 21, 1997, https://legal.un.org/ilc/texts/instruments/english/conventions/8_3_1997.pdf

57 ICJ Judgment of 20 April 2010, Pulp Mills on the River Uruguay (Argentina v. Uruguay), 135–20100420-JUD-01–00-EN, p. 14, https://www.icj-cij.org/case/135.

58 ICJ Judgment of 25 September 1997, Gabčíkovo-Nagymaros Project (Hungary/Slovakia), 092–19970925-PRE-01–00-EN, p. 7, https://www.icj-cij.org/case/92.

3.3. Necessity of a New International Agreement

As mentioned above, the decline of the Caspian Sea's water level is scientifically proven and an intensifying crisis for the region. Despite the Caspian historically experiencing natural fluctuations, recent scientific evidence indicates that the current trend represents an accelerating decline rather than a cyclical pattern. Natural (climate change altering the balance between evaporation and precipitation) and anthropogenic (dam construction, hydrocarbon extraction, desalination, shipping operations, and weak environmental regulations) factors are jointly reshaping the hydrological balance of the Caspian Sea. In this context, reliance on the existing legal instruments is no longer sufficient.

Existing international legal instruments regulating the Caspian Sea establish important principles of sovereignty, delimitation, and cooperation. However, they do not contain binding and efficient rules specifically designed to address water-level decline, coordinated river-basin management, or climate regulation. At the national level, the littoral states have adopted environmental and water legislation to address various aspects of environmental regulation. However, these national legislations face significant challenges of implementation, enforcement, and institutional capacity. In most Caspian states, climate change is addressed primarily through policy rather than through comprehensive, binding climate legislation. Kazakhstan's Ecological Code constitutes a notable exception, as it integrates environmental protection with climate regulation and provides a more advanced normative basis for addressing the impacts of the Caspian Sea's decline. Overall, domestic legal regimes remain territorially limited and uneven, whereas the causes and consequences of the Caspian Sea's water level decline are regional and transnational in nature. The absence of specialized provisions reveals a clear normative and institutional gap between the scale of the environmental risk and the current legal response.

The problem's transnational character further underscores the need for a new agreement. As the Caspian Sea is a closed basin, any alteration in inflows or coastal development within one littoral state inevitably affects the ecological balance of the other littoral states. As discussed above, water level decline causes significant environmental, economic, and political impacts to the region, including biodiversity loss, salt storms,[59] reduced shipping and infrastructure capacity, fisheries collapse, and border disputes.[60] These impacts cannot be prevented or mitigated through unilateral action, but require coordinated collective action. As a result, the decline in the Caspian water level constitutes not only an environmental problem, but also a matter of regional development, economic security, and social stability.

Recognizing the environmental and geopolitical risks posed by the declining water level, the leaders of the littoral states have addressed the issue on various occasions.

[59] Aigerim Duisembay, "How the Shallowing of the Caspian Sea Affects the Economy of Coastal Regions and Logistics," Kazinform, January 7, 2026, accessed March 19, 2026, https://www.inform.kz/ru/kak-obmelenie-kaspiya-vliyaet-na-ekonomiku-pribrezhnih-regionov-i-logistiku.

[60] Umud Shokri, "Caspian Sea Decline Harms Iran and Raises Regional Tensions," Stimson Center, November 7, 2025, accessed March 19, 2026, https://www.stimson.org/2025/caspian-sea-decline-harms-iran-and-raises-regional-tensions/.

For example, on October 18, 2025, the President of Azerbaijan, Ilham Aliyev, called on the Caspian littoral states to strengthen cooperation, exchange scientific data and develop coordinated measures in response to the rapidly declining level of the Caspian Sea. On September 8, 2025, the President of Kazakhstan, Kassym-Jomart Tokayev, announced the launch of an international program calling on Caspian littoral states to unite scientific efforts and policy measures to save the Caspian Sea from its rapidly declining water levels. Similarly, the President of Turkmenistan, Serdar Berdimuhamedov, highlighted the crisis of declining water levels and initiated the Caspian Environmental Initiative, a platform for dialogue on protecting the Caspian ecosystem. Moreover, Russia's Prime Minister, Mikhail Mishustin, stressed that Russia is taking active measures in response to the lowering water levels and that a joint working group with Azerbaijan has been established to address the problem. In addition, Iran's Foreign Minister urged the five Caspian Sea littoral states to adopt a unified, scientific approach to address the lake's receding water levels caused by climate change, dam construction, and reduced river inflows.

A number of studies addressed the regulation of shared water bodies. Mitchell and Zawahri[61] showed that treaty features such as monitoring, information exchange, and enforcement provisions are statistically associated with better cooperation and reduced conflict over shared rivers. In addition, the UN Economic Commission for Europe identifies the existence of joint bodies, mechanisms, or commissions as a core indicator of whether transboundary water cooperation is operationally effective.[62] These establishments foster communication, data exchange, joint planning, and dispute resolution. Further study finds that river commissions and similar institutional mechanisms facilitate long-term cooperation, build technical knowledge and routinize structured interaction among riparian states.[63] Regimes that rely only on political declarations or *ad hoc* cooperation have proven insufficient to address complex, long-term, and climate-driven challenges. Moreover, principles of international environmental law, including the duty to cooperate, the obligation to prevent harm, the precautionary principle and intergenerational equity, support the adoption of proactive and coordinated measures in situations of serious and uncertain risk.

Considering all the above, a specialized international agreement on Caspian Sea water level management and climate adaptation is legally and scientifically justified. Such an instrument would complement existing frameworks by providing binding, operational rules, institutional capacity, and adaptive regulation tools necessary to respond effectively to the decline of the Caspian Sea.

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61 Sara M. Mitchell and Neda A. Zawahri, "The Effectiveness of Treaty Design in Addressing Water Disputes," *Journal of Peace Research* 52, no. 2 (2015): 187–200, https://doi.org/10.1177/0022343314559623.

62 United Nations Economic Commission for Europe, *Progress on Transboundary Water Cooperation under the Water Convention: Third Report on Implementation* (2024), https://unece.org/sites/default/files/2024-12/-2417627_E_PDF_WEB.pdf.

63 Dinara R. Ziganshina, "Institutional Mechanisms for Preventing and Resolving Cross-Border Water Disputes," *AJIL Unbound* 115 (2021): 195–200, https://doi.org/10.1017/aju.2021.20.

3.4. Proposal for a New Agreement

Previous sections analyzed the national legislations of the Caspian littoral states and international agreements regulating various aspects of the Caspian Sea, as well as the necessity of a new agreement. In light of the legal challenges identified above, this article proposes drafting a dedicated agreement on Caspian Sea water-level management. Such an agreement should be considered not as a replacement of the above-mentioned conventions, but as a complementary and operational framework that transforms general provisions regarding the water level of the Caspian Sea into concrete and enforceable international obligations. Drawing upon the functional comparative analysis conducted in the previous sections, this new agreement should utilize the most advanced regulatory elements found in the domestic legal frameworks of the littoral states (such as Chapter 19 of Kazakhstan's Ecological Code) as baseline patterns for regional standards.

The proposed agreement should define a clear scope that encompasses the Caspian Sea and all transboundary activities that significantly affect its hydrological regime, including river inflows, reservoir operations, and coastal development. Guided by the customary international law principles of equitable and reasonable utilization and the obligation not to cause significant harm, key obligations should include consultation and consent for new infrastructure, minimum environmental flows and reservoir release regimes, coordinated reservoir operations, adaptive planning (including climate dimension), and climate mitigation measures, as well as financing mechanisms. These obligations would ensure that new projects do not undermine basin stability, that reservoirs are operated collectively to protect water levels and ecosystems, that climate risks are addressed through both mitigation and adaptation, and that sufficient financial resources are available to support implementation. In addition, given the primary role of the Paris Agreement (2015) in global climate response, the proposed agreement focuses more on the anthropogenic drivers of the water-level decline problem. Nevertheless, considering the legal challenges in the climate legislations of the littoral states, it should include climate mitigation measures.

Joint monitoring (similar to the CASPCOM model) is crucial to ensure the continuous collection, verification, and transparent exchange of hydrological, climatic, and reservoir data, providing a common, scientific basis for decision-making and early warning of critical water-level declines. Such a system would enhance trust among the parties and enable coordinated, evidence-based responses to potential risks. The proposed agreement should also establish a permanent basin regulatory body to supervise implementation, coordinate policies, and manage technical cooperation. In addition, it must include robust compliance and verification mechanisms to ensure compliance with agreed-upon obligations, as well as clear and effective dispute-resolution procedures to manage disagreements.

The proposed agreement would address the decline in water levels by defining obligations for the Caspian littoral states to protect the basin's ecosystem. Through these obligations and institutional mechanisms, it would enable early detection of risks, ensure accountability, and promote long-term, cooperative responses to the water-level decline problem. In this way, the proposed agreement would provide the legal and institutional

mechanisms required to move from fragmented national responses to an integrated and adaptive regional regulation framework for the Caspian Sea.

4. Conclusion

The declining water levels of the Caspian Sea are no longer a scientific forecast; it is today's regional crisis. This study has demonstrated that, while the scientific reality of the decline is well-documented, the legal response regulating the basin remains trapped in a fragmented, ambiguous state.

Through a doctrinal and comparative analysis of domestic legislation, it is clear that national legislation among the littoral states lacks the harmonization required for transnational water management. Furthermore, existing international agreements, such as the Tehran Convention, primarily address pollution and biodiversity without providing robust mechanisms to manage the anthropogenic and natural fluctuations in water levels.

The findings of this research suggest that the environmental disaster in the region can be avoided through a new and specialized international agreement. This proposed framework must harmonize efforts through binding commitments on dam regulation and joint adaptive infrastructure. Without moving from unilateral, domestic policy to a unified, multilateral legal instrument, the socio-economic and ecological integrity of the Caspian littoral states is insufficient.

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