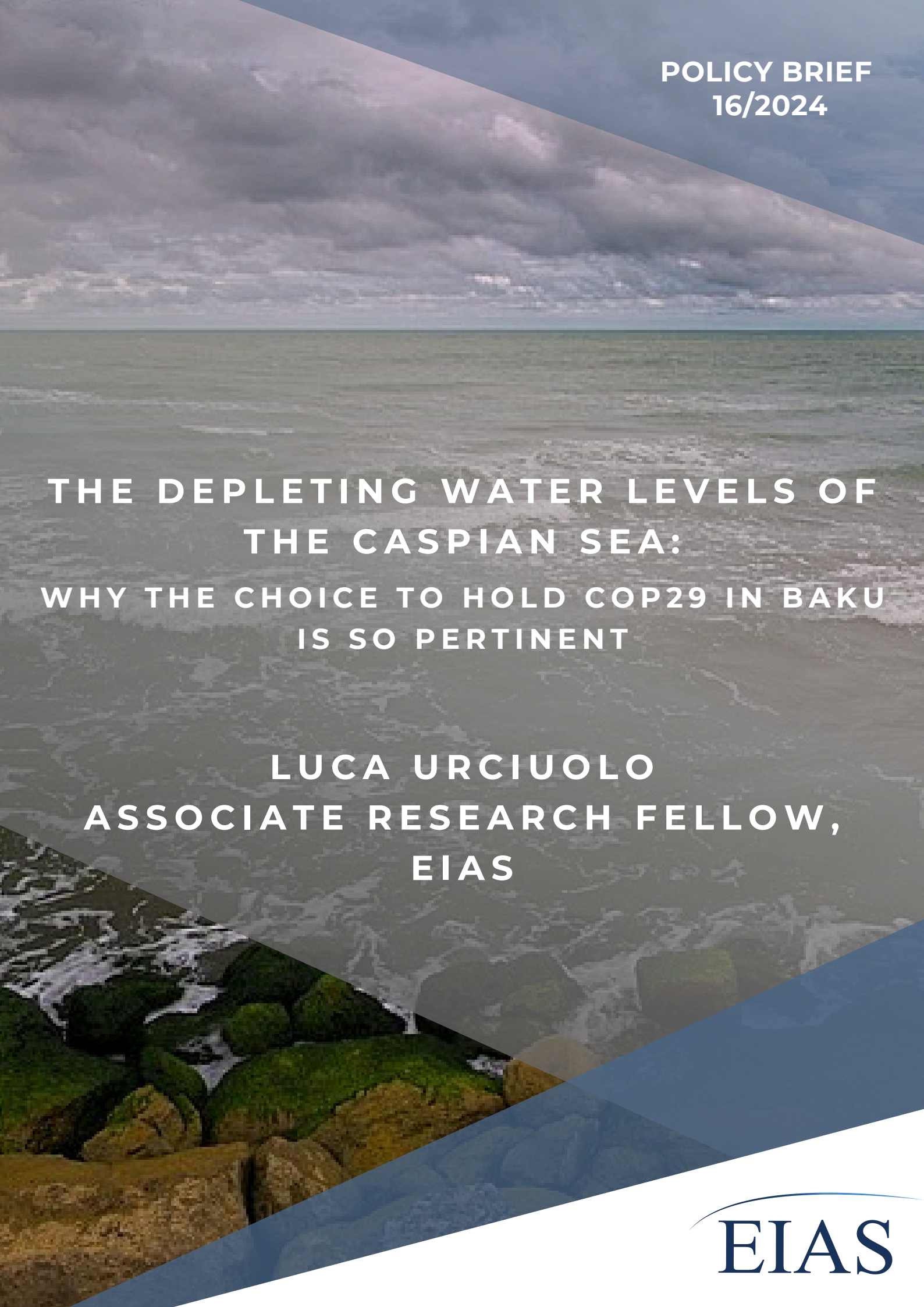

POLICY BRIEF
16/2024

THE DEPLETING WATER LEVELS OF THE CASPIAN SEA:

WHY THE CHOICE TO HOLD COP29 IN BAKU IS SO PERTINENT

LUCA URCIUOLO
ASSOCIATE RESEARCH FELLOW, EIAS

EIAS

The Depleting Water Levels of the Caspian Sea: Why the Choice to Hold COP29 in Baku is So Pertinent

The Caspian Sea is gaining increasing centrality in new trade routes between Asia and Europe playing a fundamental role in promoting economic connectivity between the two regions. The conflict in Ukraine and the rising tensions in the Middle East and Red Sea have highlighted the vulnerability of current supply chains for essential commodities. Consequently, it has underscored the potential significance of the Caspian Sea and its surrounding states — especially Azerbaijan, Kazakhstan, and Turkmenistan — whose energy reserves and potentials could help the EU diversify away from reliance on the Russian energy sector. Additionally, these countries are expected to play a crucial role in the Trans-Caspian International Transport Route (TITR), also known as the 'Middle Corridor.' The TITR aims to integrate the economies of Central Asia, the South Caucasus, and Europe to transport goods while bypassing Russian territory. Thus, the 'Greater Caspian Region' and its littoral states have emerged as a geoeconomic linchpin amidst the ongoing geopolitical instability in the region.

Nevertheless, the Caspian Sea faces an impending ecological crisis. In addition to longstanding challenges like overfishing and pollution from petrochemical exploration, it now also confronts emerging threats related to water loss and increasing salinity. Changes in the Caspian's water levels have significant environmental and socioeconomic impacts, including damage to coastal businesses, loss of livelihoods, forced migration, and infrastructure deterioration which could far outweigh any trade benefits the Middle Corridor might bring.

While the European Union and other international players have concentrated on leveraging the Caspian Sea to achieve strategic objectives—such as diminishing Russia's geostrategic relevance over trans-Eurasian cargo movement and energy supplies—the littoral states will ultimately bear the brunt of the consequences if this approach fails to recognise the sea's ecological fragility. Specifically, the threat of excessive desalination of Caspian seawater is currently not addressed by the 2018 Convention on the Legal Status of the Caspian Sea signed by Azerbaijan, Kazakhstan, Turkmenistan, Russia and Iran. The Caspian Sea's critical importance for various purposes underscores the necessity of its preservation through coordinated efforts. While external parties can offer support, the future of the sea ultimately depends on the cooperation of the littoral states that share its resources.

In this context, the choice to hold the Conference of the Parties (COP29) in Baku, Azerbaijan, scheduled from 11 to 22 November 2024, is so pertinent, as it could be a

crucial catalyst for the states of the Greater Caspian Region in addressing the challenges of the depleting water levels of the Caspian Sea. It offers a key opportunity to gain international support and develop a unified strategy to address the ecological threats facing the region. Protecting the Caspian Sea's ecosystem and depleting water levels by ensuring a sustainable future for all littoral nations will require concerted collaboration and support from the global community. Baku's COP29 hosting underscores the economic and political consequences of the Caspian Sea drying up; emphasising the urgency of addressing these threats. The combined impacts of evaporation from dams, climate change, and increased water extraction are destabilising the Caspian Sea level, threatening ecosystems, economies, and local livelihoods. Effective solutions demand a comprehensive and coordinated approach among the Caspian littoral countries, a challenging task given the political, economic and social differences in the region.

What is at Stake if the Caspian Sea's Water Levels Decline

As Baku hosts this year's COP29, considerable attention will be drawn to the Greater Caspian Region, where the Azerbaijan Presidency has the momentum to elevate international engagement by emphasising regional priorities and encouraging active participation and support. However, the severe impact of climate change on the countries in the Greater Caspian Region is poorly understood elsewhere. Air temperatures in Central Asia have been rising two times faster than the global average, leading to more frequent and intense extreme weather events, while desertification and worsening air pollution are further exacerbating health issues.

Moreover, recent geopolitical developments have propelled the Greater Caspian Region into a period of significant opportunity. More specifically, the Middle Corridor has emerged as a potential game-changer for intercontinental trade and therefore the region as a whole. Linking China and Central Asia to Europe via the Caucasus, Türkiye and the Black Sea basin, the importance of this corridor extends beyond being a mere trade route. It is crucial in enhancing the economic resilience and trade diversification in Central Asia and the South Caucasus and the connectivity of these regions with Europe and the Indo-Pacific.

The Middle Corridor holds significant untapped potential for global supply chains. Yet, uncertainties linger over its capacity and function. Challenges vary and include balancing trans-Eurasian cargo with intra-regional trade, low trade volumes, and governance complexities across the Caspian Sea. Nevertheless, its promise lies in fostering

connections between Central Asia and the South Caucasus, diminishing dependence on the New Eurasian Land Bridge (NELB) or 'Northern Corridor,' passing through Russia. It offers an alternative for sanction-compliance issues, provides access to new markets, and offers new opportunities for business-to-business (B2B) and business-to-government (B2G) engagements in logistics, transportation, and infrastructure construction. Therefore, strategic coordination and investment alignment in key infrastructures are essential for realising long-term benefits and solidifying the Middle Corridor's role as a catalyst for regional prosperity and connectivity.

Caspian Sea Drainage (Photo Credits: Wikimedia Commons)

At the same time, the Caspian Sea faces the looming threat of an ecological collapse, the cost of which could easily dwarf any trade benefits the Middle Corridor could produce. The shrinking water levels are thereby posing a significant risk of limiting vessel sizes. While a temporary reprieve from the late 1990s to the mid-2010s masked the long-term decline, recent decades have seen a significant decrease in the sea's surface level and area. Various factors, including malmanagement of inflow rivers and increasing evaporation rates due to climate change, have contributed to this alarming trend.

Dams constructed on the Volga River since Soviet times have significantly impaired the river's inflows, crucial for maintaining the Caspian Sea level. Covering an expansive catchment area of approximately 1.38 million km^2, the Volga River basin hosts nine dams within the Caspian Sea basin. These dams account for over 75% of the total discharge into the sea, with a combined reservoir capacity of 223 km^3. Since the 1980s, fluctuations in Volga River discharge have been linked to reduced upstream rainfall and the construction of dams in the catchment area. For instance, the average annual water discharge from the Volgograd power station declined from 10,654 to 5,609 $m^3 s\text{-}1$ (per second) between 1993 and 1996, leading to an important yearly decline in sea surface.

Furthermore, intensified wind speeds foster increased evaporation over the sea, with moisture carried eastward, resulting in a net loss for the Caspian Sea drainage basin. Overall, rising air temperatures and heightened winds, compounded by reduced Volga River inflows, exert a notable impact on Caspian Sea level dynamics. By 2017, the water level barely exceeded its historic low in the 1970s. The sensitivity of the sea level to climatic conditions within its catchment area is evident, with a one-degree Celsius increase in average yearly surface temperature recorded between 1979-1995 and 1996-2015, which is largely attributed to climate change. Projections suggest further temperature increases in the Central Asian region, exacerbating Caspian Sea evaporation rates. Addressing this escalating evaporation necessitates, at the very least, an equivalent increase in river discharge into the sea.

The rapid construction of desalination plants by countries in the region for human consumption, cotton production and agriculture further adds to the complexity. Desalinated water is gradually gaining importance as a supply source for the Greater Caspian Region's countries. It has, for instance, played a pivotal role in the development of Kazakhstan's Magystrau province, including the port city of Aktau. Furthermore, Turkmenistan's new port city of Turkmenbashi and Azerbaijan's port of Alat, lacking local freshwater sources, plan to rely on desalination. As a result, there is a direct relationship between desalination policy and Middle Corridor viability. Nevertheless, estimates suggest that the northern portion of the Caspian Sea, where water depths are less than 5

m, could disappear within 75 years if the water level continues to decrease at a rate of 7 cm per year. This poses a significant threat to fragile ecosystems and could severely impact the region's climate and local economy. Another study indicates that 25,000 km² of the sea is vulnerable to fluctuations, with 70% of this area located in Kazakhstan. Moreover, this rush not only risks exacerbating water loss but also jeopardises the delicate salinity balance of the Caspian Sea. Unlike the Aral Sea, which suffered a continuous decline in water levels, the Caspian Sea's decade-long stability raised questions about cyclical patterns, but recent evidence suggests otherwise. Despite being an expensive and less favoured option for the lower-middle-income countries bordering the sea, the severity of the regional water crisis has compelled these states to view Caspian saltwater as a potential freshwater resource. With several desalination projects in progress or planned, continued extraction from the Caspian Sea risks accelerating its depletion. Models predict significant water loss and ecosystem damage, emphasising the urgency of coordinated action.

Another concern related to desalination is the emergence of green hydrogen production through electrolysis. Among these initiatives, the Hyrasia One project in Kazakhstan stands out, aiming to supply a significant portion of the EU's future hydrogen needs, as it presents an opportunity for Europe to diversify energy sources and reduce reliance on Russian imports. Nevertheless, the notion of hydrogen being inherently cleaner than conventional fuels is under scrutiny. While Kazakh-produced hydrogen could support the EU's CO2 reduction goals, the potential strain on scarce resources, including Caspian seawater, warrants strong consideration, particularly concerning global ecological sustainability. It raises questions about the equitable distribution of ecological burdens, especially as the global north looks to the global south for resource-intensive solutions.

The falling level of the Caspian Sea is one of the major risks for the long-term viability of the Middle Corridor. Caspian water levels could drop by 9 to 18 m by the end of the 21st century, thus losing about a quarter of its area and uncovering about 93,000 km² of dry land–an area roughly the size of Portugal. The significance of Caspian Sea water levels is underscored by the strategic investments made by Azerbaijan, Kazakhstan, and Turkmenistan in new ports, aimed at leveraging the expansion of the trans-Caspian connectivity route linking China and Europe. Coastal cities like Baku have expanded alongside these ports, mirroring developments in Kazakhstan and Turkmenistan, where new port facilities are driving urban growth and job creation. Nevertheless, the decreasing water levels present a serious challenge, increasing the risk that ships may soon be unable to reach these ports. Kazakhstan's Garysh Sapary National Space Agency has reported a 7.1% decrease in the nation's portion of the Caspian Sea from 2008 to 2023. Likewise, a 35-40 cm drop has been noted in the water level along Turkmenistan's Caspian coast.

Inevitably, siltation near the coasts is impacting both the northern and southern regions of the Caspian Sea. The northern areas are experiencing reduced transit capacity at ports in Kazakhstan and Russia. In the south, siltation is hindering operations in Turkmenistan and Azerbaijan. In Turkmenistan, these issues are causing a significant deterioration near the Turkmenbashi seaport, which is facing stiff trade and transit competition from Kazakhstan on the eastern coast. The combination of siltation and competing oil exports poses a danger for Ashgabat. These trends are also raising alarms in Azerbaijan and Iran. The severity of potential consequences is evident from the example of the Aral Sea, where similar trends have led to political clashes. The two most immediate consequences are the decline in fish harvests and the deterioration of public health due to sea winds spreading residues of rare earth minerals previously hidden along the seabed. Moreover, the economic and political consequences of the Caspian Sea drying up are more significant.

Despite the historical reluctance of regional leaders to address environmental issues, the seriousness of the situation is prompting a shift in their approach. For instance, due to the Caspian Sea's receding waters, Kazakhstan's coastal city of Aktau declared an emergency on 7 June 2023, marking a significant change in the Kazakh government's previous reluctance to acknowledge the problem. The situation in Turkmenistan also appears delicate. Despite the extensive 1.5 billion USD repairs and upgrades in 2018, the Turkmenbashi seaport could become largely unused within ten years time. Also in Azerbaijan concerns are raised as the development of the Baku International Sea Trade Port Complex in Alat, 80 km south of Baku, aims to create a modern and cohesive port facility, while at the same time, the establishment of the Alat Free Economic Zone (AFEZ) has already injected fresh momentum into cargo transportation.

However, a further decline in water levels will restrict the size of vessels that can navigate the Caspian Sea, potentially worsening port congestion and affecting the economic viability of trans-Caspian cargo services. Additionally, the operation of desalination plants may accelerate the water level decline, exacerbating the challenges faced by coastal communities and economies reliant on the Caspian Sea's resources.

Embracing Opportunities While Addressing the Challenges

The Greater Caspian Region has a crucial role to play in connecting the EU and Indo-Pacific. However, the Caspian Sea faces severe environmental challenges, threatening both the environment and regional economic stability. The construction of dams on the Volga, a crucial inflow source for the Caspian Sea, has significantly impaired

water levels. Fluctuations in the discharge of the Volga River have been influenced by the construction of dams, coupled with increased evaporation due to climate change, thereby accelerating the decline in the water level of the sea.

Continuing on this path is unsustainable for the Caspian Sea's future and its potential contribution to shared prosperity in the Greater Caspian Region and further beyond. Rather than a barrier, modern maritime efficiencies should make the trans-Caspian component of the Middle Corridor one of the most energy-efficient and cost-effective links. The sustainability of the Middle Corridor as a major trade route is at risk due to environmental degradation. Declining water levels in the Caspian Sea will severely impact port operations, disrupt trade routes, and undermine investments in regional infrastructure if left untackled. Addressing these challenges will require coordinated regional efforts and comprehensive policies to ensure long-term viability. Strategic investments in infrastructure along the Middle Corridor, such as modernising ports and improving logistics, will be essential for its success. These investments must be accompanied by policies that promote environmental sustainability and mitigate the impact of climate change.

To tackle these issues, the littoral states should first revise and strengthen the Convention on the Legal Status of the Caspian Sea, updating it with clear provisions for environmental protection, implementing strategies to minimise the ecological impact of activities such as desalination, safeguarding biodiversity, and preserving water quality. This includes regulating dam construction, managing water extraction practices, and mitigating the impacts of climate change. Investing in infrastructure and research is equally important. Prioritising investments in infrastructure that support sustainable water management, enhancing water distribution networks, and improving monitoring capabilities are essential steps. Striking a balance between meeting human needs and conserving ecological integrity is essential for sustainable development.

Promoting transboundary cooperation among littoral states is vital. They should collaborate closely on managing shared water resources, sharing essential data on water quantity and quality, controlling pollution from industrial activities, and collectively undertaking conservation efforts to restore and sustain the Caspian Sea's delicate ecosystem. Therefore, these states should exert pressure on Russia to decrease diversions from the Volga River. On the other hand, Russia should also recognize that it faces significant political instability due to the declining Caspian Sea level, particularly impacting the livelihood of the Republic of Dagestan.

Especially since there have been no concrete steps forward since the signing of the Convention in 2018, while littoral states should take the lead in addressing these

challenges, the international community has a crucial role to play. At COP29, the ambition of Azerbaijan is to be pivotal in enhancing international cooperation in formulating and implementing strategies to protect the Caspian Sea's ecological health and depleting water levels. This includes fostering agreements on water management, mitigating climate change impacts, and promoting sustainable development practices across the region.

The EU should leverage its expertise to assist Azerbaijan and the other littoral countries in addressing this critical environmental situation before it becomes irreversible, unless we want the Caspian Sea to suffer a fate similar to the Aral Sea. The drastic shrinkage of such a significant body of water would have severe environmental, economic, and social consequences. By leveraging its knowledge and resources, the EU should support the implementation of sustainable solutions to preserve the Caspian Sea. Capacity building efforts include assisting littoral countries in sustainable water management through training programs, workshops, and sharing best practices in environmental conservation and resource management. Supporting the development and implementation of robust environmental policies and regulations is crucial, with the EU offering guidance on legislative drafting and promoting alignment with international standards like the Caspian Sea Legal Status Convention. Financial assistance can be directed towards sustainable development projects, including infrastructure, ecosystem restoration, and investments in clean technologies to mitigate environmental impact. This effort would underscore the EU's commitment to sustainable development and environmental stewardship, bolster its leadership in the global energy transition, and set a precedent for international cooperation in addressing environmental crises.

Hosting COP29 places Azerbaijan at the forefront of efforts to mitigate also the environmental impact of energy production in the region. This will allow the country to demonstrate how a major energy producer can transition towards more sustainable practices while addressing the specific environmental threats facing the Caspian Sea. Similar to the coordination required for the Middle Corridor, a unified policy of the Caspian littoral countries together with the cooperation of all the international COP29 stakeholders will be necessary to overcome this collective action problem.

The success of COP29 in Baku in addressing these critical issues hinges on the ability of the international participants to elaborate pragmatic solutions in supporting Azerbaijan for putting the depleting level of the Caspian Sea on the agenda. Effectively addressing this issue demands a comprehensive approach for the entire region. Such an approach is necessary to manage the ecological health of the Caspian Sea, develop sustainable energy infrastructure, and ensure the stability of the Middle Corridor. Overcoming political, economic, and social differences is hence essential for achieving these goals and ensuring the region's long-term prosperity.

As the global community gathers in Baku, the outcomes of COP29 will be pivotal in shaping the future trajectory of climate action, regional stability, and economic prosperity. By embracing this opportunity, Azerbaijan and the Greater Caspian Region play a significant role in global climate efforts, setting a benchmark for regional cooperation and sustainable development. The stakes are high, and the potential for transformative impact is immense, highlighting the importance of COP29 in driving a sustainable and resilient future for the region and the world.

The concerted efforts at COP29 in Baku should herald a new era of sustainable connectivity, stability, and prosperity across Europe and Asia. By addressing the environmental challenges such as the depleting water levels of the Caspian Sea, the Greater Caspian Region significantly contributes by fostering regional cooperation and leveraging strategic opportunities to global climate goals ensuring a sustainable and prosperous future for all.

European Institute for Asian Studies - EIAS a.s.b.l.

26 Rue de la Loi, 10th floor
B-1040 Brussels

Tel.: +32 2 230 81 22
E-mail:eias@eias.org
website: www.eias.org

LinkedIn: European Institute for Asian Studies
Facebook: EiasBrussels
Twitter: @EIASBrussels

EIAS