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AMID LEBANON'S PERFECT STORM OF CRISES, WATER DEMANDS ATTENTION

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Lebanese crises have repeatedly made international news since October 2019, when the country witnessed the start of a popular revolution against a stagnant and corrupt political elite. The issues raised by the protesters subsequently proved even more critical than expected due to the 2020 Beirut port explosion, unprecedented levels of inflation, and the ongoing fuel and food emergencies. Much less discussed but no less critical is the issue of water. The problem has been slumbering for years but has recently come to light along with other failings of the Lebanese government.

The issue of water takes two forms. First, Lebanon is experiencing a *water resource management crisis*. Climate change and the unsustainable use of water resources are harming the health of people and the environment. Lebanon is suffering increasingly frequent droughts as well as overexploitation and pollution of groundwater and rivers, in turn threatening the country's future food security. Second, years of mismanagement and the current fuel and financial crises have caused a *public water service crisis*, with Lebanon's water supply sector having come to the brink of total collapse and threatening access to safe and sufficient drinking water for much of the population. These two issues urgently need to be addressed to avoid even bigger problems in the near future. But the competing challenges Lebanon is currently grappling with are blocking decisive action on both.

The water resource management challenge

Thanks to its snowcapped mountains, whose seasonal melt and runoff feeds a variety of rivers and aquifers, Lebanon always enjoyed abundant water resources compared to many of its neighbors. The country counts 40 rivers, of which 16 carry water throughout the year. They mainly flow from the centrally located Mount Lebanon into the Mediterranean Sea and neighboring countries. Major rivers include the Litani (170 kilometers long with a basin area of nearly 2,200 square kilometers), the Assi (known in English as the Orontes, flowing into Syria, Turkey, and the Mediterranean Sea), and the Wazzani and Hasbani (found in southeastern Lebanon, they are two of the main tributaries of the Jordan River, and flow into the Dead Sea). Aquifers cover more than half of Lebanon's total territory, an area of over 5,600 sq km. The Food and Agriculture Organization estimates that the country possesses a total of [4.5 billion cubic meters](#) of renewable freshwater annually.

Despite the country's rich water resources, climate change is causing similar issues in Lebanon as in many other places across the region. Year after year, Lebanon experiences an increasing number of [heatwaves](#). With a 2°C temperature increase, the snow cover on the Mount Lebanon mountain chain is expected to [reduce by 40%](#). As this range feeds

the majority of Lebanon's rivers and aquifers, there is a legitimate risk of those rivers drying up and groundwater levels falling, contributing to further aridity and erosion of the land. Climate-induced extreme weather events, like the fires and floods that are already a yearly challenge for Lebanon, will also increase. The combination of these gradually worsening climate pressures and the regulatory challenges discussed below explains why the yearly available freshwater resources per person decreased from 1,400 cubic meters 30 years ago to [600 cubic meters today](#) — with 1,000 cubic meters considered the threshold for water stress.

Besides ravaging ecosystems, droughts strain agricultural production and undermine food security. Ready access to food is already under threat for millions of Lebanese as the country is a net food importer, [purchasing](#) almost 100% of critical products like rice, vegetable oil, refined sugar, and over 80% of its cereals from abroad. When it comes to grain imports in particular, [80% and 16%](#) are imported from Ukraine and Russia, respectively, exposing Lebanon's high vulnerability to global upheavals like the current Russo-Ukrainian war. By 2030, the Lebanese agricultural sector is expected to [lose](#)

[nearly 50% of the value](#) it had in 2010 — especially as one of the regions most affected by water scarcity will be the Bekaa Valley, the country's leading agricultural center. This problem will increase as agricultural production declines, leading to rising food prices and fewer jobs. The burden is falling on rural and lower-income families in particular, as they are most often employed in agricultural work and rely largely on local production for their food intake. As lower-income families also spend a relatively higher share of their earnings on food, rising food prices disproportionately affect them. Notably, lower-income households include many of the estimated 1.7 million Syrian refugees in Lebanon, of whom approximately [40%](#) live in the poorer Bekaa Valley and are hit particularly hard by the economic situation.

Water resources also suffer from years of unsustainable and inefficient use. Private citizens, agriculture, and industries use to excess both ground and surface waters in most regions in Lebanon. In addition to the known overexploitation practices, households, farmers, and companies have dug over 60,000 unregulated private wells across the country to compensate for the insufficiency of public utilities. The Lebanese government



Photo above: A young boy seen selling clean water in a shop in Tripoli, Lebanon. Photo by Susanna D'Aliesio/SOPA Images/LightRocket via Getty Images.

has also fallen behind in investments needed to improve the efficiency of the aging water infrastructure and to fix the many leakages in the system. Moreover, years of unregulated dumping of waste and pollutants from households, agriculture, and industry have left Lebanon's rivers contaminated. An example is the Litani River, where, last year, the heavily polluted water caused [40 tons of dead fish](#) to wash up on the shore of Qaraoun Lake. Carcinogenic pollutants and heavy metals can be found in the water, soil, and across the food chain, and [90% of wastewater remains untreated](#) and flows directly into Lebanon's main rivers and the Mediterranean Sea.

As these issues worsen, so do harmful human responses to them. In Lebanon, the decrease in groundwater reserves pushes people to dig deeper wells to reach the water, further eroding the land. Farmers continue their excessive use of pesticides and fertilizers to save their decreasing crop yields, which harms the soil in the long run and increases the levels of nitrogen and heavy metals in aquifers.

The public service crisis

These challenges are not unique to Lebanon but are widespread across the Middle East and North Africa region. As the climate crisis worsens, many governments are gradually realizing that they need to take faster and more determined action to break these harmful cycles. Lebanon, even if endowed with relatively abundant water resources, needs to prepare for the inevitable sharp decrease in water availability in the near future. But the Lebanese government and society as a whole do not currently have the capacity or willingness to undertake these actions.

Since October 2019, when Lebanese protesters took to the streets to denounce years of corruption, financial mismanagement, and political stagnation, Lebanon has experienced a series of compounding crises. The economy collapsed, crushed by an astronomical [\\$100 billion in public debt](#) and the consequences of the COVID-19 pandemic. The Lebanese pound (LBP) has now [lost 95% of its value](#) against the U.S. dollar, while [food prices have increased seven-fold](#) since 2019. As a consequence, 80% of the population now lives in poverty. The Beirut port explosion in August 2020 — which killed at least 218 people, caused \$15 billion in damage to homes and businesses, and whose victims are yet to receive compensation — further eroded the trust between Lebanese citizens and their leaders. Due to the loss of the LBP's value, the Lebanese government has been unable to afford fuel,

causing a widespread energy crisis and rendering public electricity and water infrastructure across the country nonfunctional. The current volatile food and energy prices on the international market have only added to the desperate economic and political situation.

The water sector was already fragile before the start of the crisis in 2019. The Water Establishments — the four regional government bodies under the Ministry of Energy and Water responsible for public water service provision and wastewater treatment — were understaffed and [lacked the autonomy](#) to carry out many of their responsibilities, including hiring and firing staff. Some rural areas in Lebanon did not have sufficient access to electricity to make water pumps and wells function properly. And much of the water was lost to widespread leakages across the aging pipe network. The financial crisis and lack of fuel have exacerbated these issues. Since 2019, public water supplies have fallen significantly, from an [average of 120 liters per capita per day](#) to below the necessary [daily quantity per person of 35 liters](#). [Over 70%](#) of the Lebanese population currently faces critical water shortages. These are especially severe in regions that are already more remote and have historically received less investment in public infrastructure, like the Bekaa Valley and North Lebanon. The lack of electricity has caused frequent [shutdowns of several wastewater treatment facilities](#), discharging untreated sewage into the already heavily polluted rivers.

The national currency's sharp drop has itself generated a cascade of negative effects on the reliability of the domestic water transmission and distribution system. Due to government wages being paid in the massively devalued LBP, large numbers of staff at the Water Establishments, like those at other government institutions, have stopped showing up for work. Moreover, maintenance equipment for the water network is mainly imported in U.S. dollars, which the Water Establishments are no longer able to afford. Lebanese residents still pay their water usages fees in the devalued LBP, which now cover only a fraction of the Water Establishments' running costs. Finally, widespread financial strain has caused some citizens to stop paying their water bills altogether, further impeding the Water Establishments' functioning and eroding public trust in the government's ability to carry out its duties.

To deal with these issues, most Lebanese make use of private water trucking operations — a booming business that ensures more reliable access to water but is far more expensive than the public water network and offers no guarantee on water



Photo above: Polluted water in the Lebanese capital, Beirut, with garbage piling up along the river bank. Photo by PATRICK BAZ/AFP via Getty Images.

quality. Even before 2019, the water trucking sector generated a [yearly revenue of \\$80 million](#). The average cost for trucked water has increased sixfold since then, making a weekly water tank refill [more expensive than the monthly minimum wage](#). Similarly, the cost of bottled water has increased eightfold in three years' time. The minority of the population that has the means to do so invests in private wells.

Climate change has not caused the public water service crisis, although it has worsened it to some degree. Instead, it is a consequence of the combination of long-term structural issues in the water sector and the financial and political crises that have deadlocked the country.

Who will take care of Lebanon's current and future water needs?

At the same time, the water service crisis indirectly hampers the government's ability to undertake much-needed climate action. When immediate issues of food, energy, and wages are at the top of the agenda, there is not much room left for seemingly less urgent discussions about sustainability. Climate

change was [barely discussed](#) during the parliamentary election campaign last May. People's belief that the economy may rebound in the near future is [abysmally low](#), and their trust in government institutions is close to non-existent as these seem unable to carry out their basic responsibilities, let alone provide leadership for planning ahead. Considering international donors' interest in climate action and the potential for funding this would bring, it is not impossible that the political class might — on paper — make such calls, especially in the context of the upcoming United Nations Climate Change Conferences in the Arab region (COP27 in Egypt this year and COP28 in the United Arab Emirates in 2023). But even if this happened, many Lebanese are not currently receptive to such ideas coming from their government. While the various energy, currency, and other crises are ongoing, discussions regarding the sustainable use of water resources come across as predominantly elitist and largely unhelpful.

Still, action is necessary to prepare the country for the effects of climate change. Realistically, solutions will not come from the government, as it would require state actors to implement, regulate, and enforce policies and plans — something the Lebanese government is incapable of doing at present.

Considering the current context in which every state agency is stretched thin and climate issues are barely addressed, it is crucial to adjust the scope of ambitions. There are some modest entry points for action, however:

1. The Lebanese government needs to prioritize resolving the power crisis, as this will (at least partially) unblock the public service crisis regarding water and electricity that the country is facing. Only after the most urgent matters have stabilized might there be renewed public support for addressing longer-term societal concerns, including climate change. In part this will require the international community to inject liquidity into the Lebanese economy. But international actors have understandably been reticent to do so because of a habitual mismanagement of funds in Lebanon's corrupt and clientelist system.
2. The Lebanese government must carry out more maintenance work on the water network to minimize leakages. This is low-hanging fruit within the government's reach. While in no way a replacement for addressing the more severe issues plaguing the water governance system, such maintenance work would boost the efficiency of the system and, therefore, increase the availability of water. It would also demonstrate that the government has some willingness and capacity to be active on this issue to benefit its population.
3. Municipalities, civil society organizations, and businesses should collaborate to raise awareness among the population regarding the shared nature (and therefore shared challenges) of water resources. As leadership is not currently coming from the top down, action needs to emerge from the bottom up. People might not have the space and energy for long-term thinking about the theoretical implications of climate change, but they are already seeing how floods and forest fires are increasing, how their rivers are drying out, and how their crop yields are decreasing yearly. Municipalities, civil society

organizations, and businesses will not fix the entire water system, but they can collaborate on small-scale responses with local effects — such as through projects to replant trees to promote a healthier water cycle or information campaigns regarding the long-term effects of pesticides on the land and water.

4. The international community should augment its climate finance to Lebanon. Of all MENA countries, Lebanon has received some of the lowest amounts of such funds. Yet as a country already strongly experiencing the effects of climate change, Lebanon is in particular need of “climate adaptation” funding, meaning financial support to help its society deal with the negative consequences of rising temperatures and more extreme weather events. Where possible, climate finance should go directly to civil society organizations and businesses in Lebanon to avoid passing through corrupt and inefficient government institutions that have repeatedly shown that they perpetuate a broken system.

Even before the start of the crisis in 2019, it was already necessary to address Lebanon's unsustainable and dysfunctional water governance system — both in terms of service provision and natural resource management. While Lebanon's water availability and quality are strained in the short run by its financial and governance crises, the problems will only increase exponentially in the long run as climate change and unsustainable water management practices persist. The compounding of governance crises with increased manifestations of climate change has only made these matters more urgent.

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