A NATION RUNNING DRY:

GROWING CROSS-SECTOR IMPACTS OF LEBANON'S DROUGHT

العمل ضد الجوع
ACTION AGAINST HUNGER

OVERVIEW

50%
2024-25 Season

RECORD LOW RAINFALL

Lebanon is facing its worst drought on record, with the crisis set to continue as the summer heat subsides. Rainfall in the winter 2024-25 was down 50% from the preceding year, drastically cutting snow melt and river flows and reducing water levels in critical reservoirs and aquifers to their lowest in decades. With no snow and insufficient rain expected over the autumn, there is little relief on the horizon.

1.85M - Nearly one-third of total population

POPULATION AT RISK

Communities are suffering the consequences across the country. Lebanon's WaSH sector assesses that approximately 1.85 million people – nearly one third of the population – are living in areas highly vulnerable to drought (precise numbers of those directly affected are difficult to determine due to a lack of real-time monitoring data). Public water systems are under severe strain due to depleted aquifers, damaged infrastructure and frequent power outages. Major springs are running low and local wells are increasingly under pressure, fuelling fierce competition for resources.

44%
of the national population rely on water trucking

WATER SYSTEM UNDER STRAIN

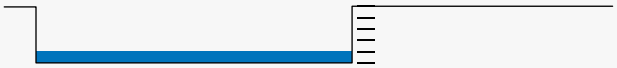
Mitigation measures present their own challenges: in several areas harsh water rationing is in place, and the national population is increasingly reliant on costly and often unsafe water trucking services – a dependence that is expected to rise. The prolonged dry conditions have also intensified wildfire risks, threatening livelihoods for farmers already struggling with the lack of irrigation. The climatic conditions place another layer of pressure on a country yet to recover following the conflict escalation, with many critical water systems and farmland resources badly damaged or destroyed.

Water level at Lake Qaraoun, Lebanon's largest reservoir, is critically low

FALLING LEVELS, RISING NEEDS

Lake Qaraoun

Lebanon's largest reservoir, critical for agriculture irrigation and hydroelectric power generation



currently storing only 50 million m^3 of water, down **64%** from last year's 138 million m^3 (total storage capacity around 220 million m^3)

Assi (Orontes) River

One of the country's major rivers, critical to agriculture in the Bekaa

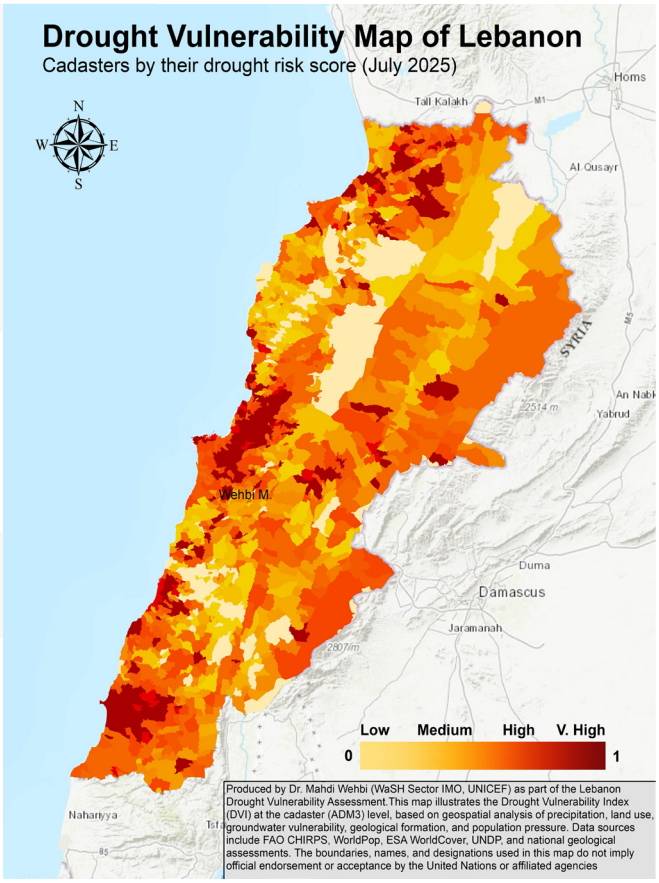
flow at >60% below seasonal average

of wells dried up across the country

Wazaani Spring, South Lebanon

Serves around 40 villages or 140,000 people (with Taybeh regional station)

Yield down to 160 m^3/h, from 6000 m^3/h



1.85 million people in Lebanon are assessed to live in drought-vulnerable areas

274 cadasters (of around 1600 nationwide) identified as highly or very highly vulnerable by the WaSH sector

MULTI-SECTOR RISKS AND IMPLICATIONS

DETERIORATING HYGIENE

With limited water availability in households and schools, hygiene practices are often compromised, including reduced hand-washing and unsafe food preparation. It is an increasing challenge to keep homes and community spaces clean, as any available water is prioritised for drinking.

Examples from the Qaa Baayoun Informal Tented Settlement (ITS) in the Bekaa illustrate how families are forced to resort to negative coping mechanisms, putting their health at risk. After a borehole that previously served three nearby settlements completely dried up, one woman has had to look elsewhere for water to meet the domestic and drinking water needs for her family of six, and to significantly cut back on their overall consumption. Instead of filling her 1200 litre tank every six days, she now fills it only once every 15 days, impacting the family's personal hygiene, cooking, and cleaning routines. She gives her baby a shower only every three days instead of daily, and she no longer cleans her tent every day as she used to. These changes have affected the hygiene conditions inside the tent and added to the stress of managing daily life with minimal water access. Another family of 10 in the same settlement have had to reduce their daily consumption from 200 liters to 100, risking multiple diseases as a result of poor hygiene. Significant refugee movements into and out of Lebanon during 2025 following the change of government in Syria have led to the depopulation of some ITSs and a surge in demand elsewhere[1], making this a critical moment to ensure continuity of support, including adequate WaSH facilities for those in need.

[1] *https://www.unhcr.org/sites/default/files/2025-06/Lebanon-flash-update-new-arrivals-syria.pdf*

Local water supplies are becoming increasingly contested: before the drought this borehole would have provided water for ten households, comprising 53 individual, who now need to source it elsewhere

A tent in Qaa Baayoun: with no connection to the water network, households must fill their tanks from a limited number of depleted wells, using containers like those pictured

WATERBORNE DISEASE RISKS

When water scarcity drives people to resort to unsafe water sources, such as unregulated wells and stagnant or low-flow water systems, a high-risk environment for disease outbreaks quickly develops. In recent years Lebanon has fallen victim to several waterborne disease outbreaks, and national surveillance systems supported by the Ministry of Public Health and international partners indicate a heightened risk during drought periods.[3]

ACUTE WATERY DIARRHEA (AWD)

A major public health risk during droughts, notably among children under five. If untreated, it can result in severe dehydration and death. In Lebanon, AWD cases historically surge during water stress, particularly in ITSs and collective shelters, due to inconsistent water trucking and poor sanitation, and in urban slums, due to ageing water networks and intermittent supply.

HEPATITIS A

Can result from using contaminated water systems, as demonstrated by outbreaks in recent years. In 2022 hundreds of cases in Tripoli and Akkar were traced to sewage water being mixed with drinking water, due to crumbling infrastructure and a lack of proper treatment systems. In West Bekaa in 2024 over 40 confirmed cases were linked to contaminated water sources.

CHOLERA

Classified as endemic in Lebanon due to the reporting of locally-transmitted cases within the last three years, remains a concern. The environmental persistence of pathogens, compounded by reduced water flow, heightens the risk of cross-contamination between sewage and drinking water systems, particularly in areas with deteriorating infrastructure.

TYPHOID FEVER

An elevated risk due to the increased reliance on unsafe water trucking and storage. In mid-August Lebanon's Public Health Ministry reported 282 cases this year so far[4], including a cluster of 20 in Mais al Jabal, a village in the South[5].

HEALTH SYSTEM UNDER PRESSURE

Lebanon's health system is already fragile – strained by economic collapse, the ongoing refugee crisis and the lasting impacts of the conflict escalation. It is poorly equipped to manage large-scale outbreaks of AWD or cholera.

Key limitations include a shortage of trained health personnel and inadequate treatment facilities, especially in high-risk regions such as Bekaa, North Lebanon, and Akkar.

The 2022 cholera outbreak revealed systemic vulnerabilities in water and sanitation infrastructure, especially in underserved and displaced communities. As water scarcity reaches critical levels, these vulnerabilities are further magnified.

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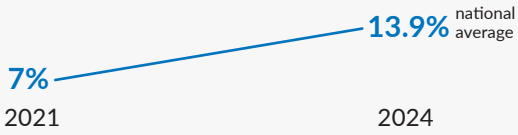
[3] *Document - Early Warning: 2025 Waterborne Disease Risk Map for Lebanon*
[4] *https://www.moph.gov.lb/userfiles/files/Esu_data/Esu_currentyear/Lebanon.htm*
[5] *These cases were reported to ACF by the Ministry, and subsequent tests on 12 different source points revealed nine to be non-conforming, of which five indicated possible faecal contamination. ACF followed up with distribution of hygiene kits, bottled water, Oral Rehydration Solutions (ORS) and chlorine tablets, alongside water-safety awareness sessions.*

RISING MALNUTRITION

Stunting (Chronic Malnutrition)
Children under 5 years



6% infants under 5 wasting (acute malnutrition)
16% children in ITSs underweight

~50% of all children — **Micronutrient Deficiencies**: iron, vitamin A, zinc, vitamin D

Water scarcity exacerbates malnutrition, particularly in ITSs and among vulnerable communities. In 2024 stunting (chronic malnutrition) among children under five was found to have doubled since 2021, rising from 7% to 13.9% nationally, and reaching 39.2% in ITSs. Wasting (acute malnutrition) was found to affect 6% of infants under six months, while 16% of children in ITSs were underweight.

Micronutrient deficiencies (iron, vitamin A, zinc, vitamin D) affect nearly half of all children, with iron-deficiency anemia particularly severe among Syrian refugee children and those in food-insecure households[6].

These conditions are directly linked to poor water and sanitation services in displacement settings, where children are more exposed to disease and unable to absorb nutrients effectively due to repeated infections.

IMPACT ON AGRICULTURAL PRODUCTION

In the agricultural sector, the drastic reduction in rainfall and snowmelt has both reduced yields and driven up costs, due to the need for additional irrigation. Wells and springs that farmers depend on have run dry, forcing them to cut back on planting or abandon it altogether. Some have shifted to buying drought-resistant seed varieties, which threatens food security and rural livelihoods due to the resulting economic pressure and reduction in biodiversity. The situation for farmers has been compounded by the lasting impact of the conflict. Water installations remain damaged and services disrupted in many areas, particularly in the south, making irrigation impossible, while explosions and large-scale fires have rendered significant agricultural areas inaccessible and inoperable.

'This year we had to irrigate winter crops like wheat and legumes up to four times instead of the usual two'.
Aref Abdalla, farmer from Sariin Fawka

"My entire livelihood depends on my 12 dunums [1.2 hectares], but this year I lost the whole summer season to drought. I'm now over $5,000 in debt, and our well has completely dried up. The Ras Ain spring is no longer accessible either; what little water remains is reserved for drinking."
Hassan, farmer from Ras Ain

The impact has also been felt by the agro-food industry, with one producer noting a significant drop in both the quality and yield of produce such as vine leaves, eggplants and figs. Rising costs in food production have inevitably led to increasing food prices for consumers, increasing the risk of negative coping mechanisms and malnutrition among the most economically vulnerable.

[6] *Lebanon Integrated Micronutrient, Anthropometry and Child Development Survey (LIMA), 2023-2024*

PRESSURES ON SOCIAL COHESION AND PROTECTION

Food prices increased 20% in July

Electricity costs $0.257/kwH (2025)

Water makes up 5-40% of household income

The competition for resources that are increasingly in short supply drives up prices of essential provisions, notably water, food and energy, intensifying pressure on communities and raising the potential for confrontation at a local level, or wider. In July, food prices in Lebanon were up by over 20% year-on-year, a reflection of reduced crop yields and higher production costs. With energy and water bills already far above the global average and the highest in the Arab world, prices have been driven up further by reduced water availability in reservoirs used for hydroelectric power. This has led to electricity rationing and an increasing reliance on expensive and polluting private diesel generators, prohibitively expensive for many households.

With some regional water supplies suspended, villages are increasingly competing for access to local wells, themselves already depleted. There are reports of isolated violent disputes breaking out due to competition for water, and a number of local protests against the water shortage.

Strained household circumstances often correlate with an increase in domestic violence, as seen during Covid-19 and the financial collapse, as well as gender-based exploitation by landlords and utility providers. As women and girls are often those responsible for collecting or purchasing water, they are increasingly at risk when they have to travel longer, unfamiliar routes to do so. Other protection concerns include limited menstrual hygiene management and restrictions on access to services as competition increases, particularly for persons with disabilities.

Electricity from private diesel generators is increasingly unaffordable

There are examples across the Middle East in recent years of social tensions rising in times of drought, not least in Syria, which suffered its worst drought in modern history in 2006-10. This led to a surge in internal displacement from rural areas, resulting in overcrowded cities, unemployment and stretched services, all of which contributed to the unrest & subsequent civil war that erupted in 2011. While there are differences in Lebanon's current situation, there is a real risk that the strain on communities from water shortages and food insecurity could build into more widespread social tension.

THE NEED FOR A COORDINATED RESPONSE

While Lebanon's authorities are doing what they can to address these impacts, they need external support, capacity building and coordination to make plans a reality.

The Ministry of Energy and Water has issued a national water scarcity plan prioritizing strict rationing of supply, enhanced water quality surveillance, and emergency allocation strategies. This plan is aligned with the humanitarian WaSH sector's intensified focus on real-time monitoring of water quantity and quality to protect public health and maintain minimum service levels. Risk mapping exercises have targeted both the epidemiological waterborne disease risk and the geographical distribution of water scarcity , but the accuracy of these is limited due to the relative lack of monitoring data available. This introduces a degree of uncertainty in prioritizing geographical areas and limits the reliability of planning processes.

Lebanon's 2025 drought presents a compound crisis, where declining water availability intersects with fragile healthcare systems, poor sanitation, and economic precarity. The lack of reliable hydrogeological data undermines authorities' ability to plan and respond, with health consequences that are already visible, particularly among displaced and vulnerable populations. Without immediate, coordinated action across WaSH, health, agriculture, and energy sectors, the country risks facing a multifaceted humanitarian emergency with lasting consequences. There is an urgent need for coordinated preparedness, community-level resilience and cross-sector resource management to contain the crisis and address its impacts across the country.

URGENT MULTI-SECTOR COORDINATION

WaSH | Health | Agriculture | Energy

RECOMMENDATIONS FOR DONORS

DATA COLLECTION AND MONITORING OF WATER SOURCES

In the absence of data on ground and surface water reserves, Lebanon's water establishments cannot make informed prioritization decisions, implement early warning protocols and anticipate future emergencies. While the authorities understand the issues and have a clear plan to address them, they require capacity building, through both direct engagement and support in implementation, and financial support, to meet their ambitions at scale and within realistic timescales. Specific data-driven approaches will help address the information gap.

Introduce quantitative groundwater monitoring
through installing geotechnical sensors (piezometers) in existing wells and those under reconstruction, to determine the level and flow pattern of groundwater. The cost of incorporating these sensors when repairing wells is far less than installing them in those already built, making the case for all rehabilitation projects to include them by default.

Equip water establishments with CCTV systems
in order not just to monitor the water level in boreholes but to identify potential blockages and capture additional data. While more expensive than other sensors, these systems can be moved between different wells, enabling more comprehensive coverage. Having recourse to this technology would also reduce authorities' dependence on external consultants, making costs more sustainable in the long term.

Increase quantitative monitoring of surface water
such as reservoirs, through water meters to determine the water volume and the proportion that reaches the community. With ageing and damaged pipelines prevalent in the distribution network, water losses are common as the limited supplies are transported to recipients.

Scale-up systematic qualitative water monitoring
of both ground and surface water to track levels of contamination before distribution to communities. When water quantity reduces, quality also declines. Limited resources and high staff turnover in the water establishment have meant qualitative monitoring is no longer systematically carried out. There is also a need for corrective controls, such as maintaining and repairing chlorination units.

WATER MARKET PRICES MONITORING

Engage and invest in the market prices monitoring initiative led by the WaSH sector with the participation of INGOs. This aims to generate timely and accurate data on water accessibility, affordability, and pricing dynamics across Lebanon.

Regular monitoring helps inform sector planning, advocacy efforts, and coordination with partners, particularly in areas that may be affected by water scarcity, droughts, infrastructure damage, displacement, or market volatility.

MONITORING AND TREATMENT IN COMMUNITIES AND HOUSEHOLDS

Once water reaches communities, additional measures are needed to check for contamination and mitigate its effects. These can make a significant difference at community and household level, but only if implementing organizations ensure coverage is broad and high standards are maintained.

Deploy mobile water testing units

in high-risk areas to monitor for contamination. There is a particular need in Akkar, Baalbek-Hermel and the Bekaa, with refugees and other vulnerable populations living in insecure housing such as ITSs, collective shelters and urban slums.

Distribute household water treatment kits

including chlorine tablets & filters, and promote safe water storage practices.

Strengthen coordination with local municipalities

to ensure water trucking services meet minimum safety standards.

DISEASE SURVEILLANCE AND OUTBREAK PREPAREDNESS

Timely action is needed to ensure outbreaks can be detected and contained, in close coordination with local communities.

Expand surveillance systems

for waterborne diseases (AWD, cholera, hepatitis A) with real-time reporting from clinics and community health workers.

Pre-position cholera and AWD treatment supplies

(rehydration solutions, IV fluids, antibiotics) in vulnerable regions to minimize delays in response when disease is detected.

Train frontline workers

on early detection of waterborne diseases, especially in displacement settings.

PUBLIC COMMUNICATIONS

Raise awareness of water conservation best practice

through tailored, inclusive communications nationwide. The Ministry of Energy and Water recently launched an integrated awareness campaign designed to improve safe & sustainable water usage, but they require the assistance of INGOs in preparing and disseminating the materials. Targeted donor funding and support is needed to sustain this campaign and ensure its lasting impact across rural, urban and peri-urban environments, and across a full range of settings, from commercial and educational to individual households.

Promote sustainability and climate-sensitive behavior

through a combination of education, public engagement, and effective communication strategies that help individuals and communities understand the causes, consequences, and solutions to climate-related challenges. Schools and universities play a vital role by integrating environmental science and sustainability into their curricula, while media campaigns, social platforms, and community events amplify messages that resonate with diverse audiences. Grassroots initiatives, cultural expressions, and storytelling make the issue more relatable, encouraging behavioral change and civic action.

AGRICULTURE AND LIVELIHOODS

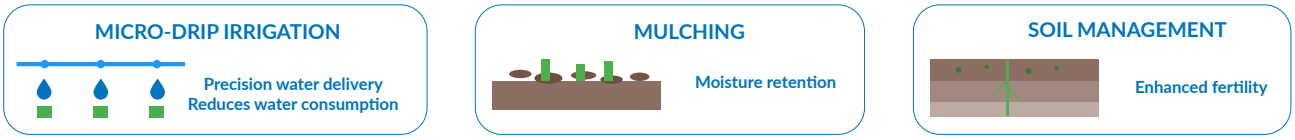
From a Food Security and Livelihoods perspective, it is essential to promote climate-smart and sustainable agricultural practices that align with agroecology principles, helping farmers adapt to prolonged drought conditions.

Introduction and scaling-up of techniques that reduce water consumption
such as micro-drip irrigation, mulching, and other soil management practices that improve retention and fertility. These measures, rooted in sustainable farming approaces, not only reduce dependency on increasingly scarce water resources but also enhance soil health and resilience, thereby supporting both agricultural productivity and the long-term sustainability of rural livelihoods.

Establish and Enhance Water Harvesting and Storage
by promoting rainwater harvesting at farm and community levels; Constructing small-scale reservoirs and underground cisterns to store water during wet seasons; and encouraging the use of treated wastewater for irrigation where feasible and safe.

Promote Climate-Smart Agriculture
by introducing drought-tolerant crop varieties suited to Lebanon's agro-ecological zones; Encouraging crop diversification to reduce dependency on water-intensive crops like potatoes and tomatoes; supporting conservation agriculture practices such as minimum tillage, mulching, and crop rotation.

Build Institutional Capacity
by supporting the Lebanese Agricultural Research Institute (LARI) in expanding drought-related research and extension services; Improving coordination between the Ministry of Agriculture, Ministry of Energy and Water, & local municipalities; and integrating drought risk management into national agricultural planning and budgeting.



SUSTAINABLE RECONSTRUCTION ALONGSIDE EMERGENCY REPAIRS

Destruction caused by the conflict, combined with a lack of resources to fund and carry out vital repairs and maintenance, render the need to rehabilitate the water system more urgent than ever.
The WaSH sector has provided a comprehensive list of humanitarian and development measures[9], including:

Uplift communities' access to water in the immediate term
through the provision of safe water trucking where shortages are most acute, while installing public drinking water points, repairing leaks and providing diesel and backup generators to sustain operations at key pumping stations.

Invest in rehabilitating water infrastructure for the future
through rebuilding and upgrading pumping stations, wells and pipeline networks, incorporating monitoring technology wherever possible.

There is a pressing need to **leverage diplomacy to make reconstruction possible,** creating space for repairs and minimizing the risk that the recovery effort be jeopardized by ongoing violence. To ensure their investments are built to last and not subject to further targeting, donors must call on all parties to respect international humanitarian law, uphold the ceasefire agreement and refrain from attacks on water facilities and other civilian infrastructure.

EFFECTIVE MULTI-SECTOR COORDINATION

With the impact of this crisis being felt across society, it is vital that the response is not delivered in isolation. Donors are encouraged to do all they can to **promote an integrated cross-sector response** in coordination with national, regional and local authorities, alongside NGOs on the ground. While the Ministry of Energy and Water has a plan, it requires close cooperation with the Ministry of Agriculture, the Ministry of the Environment and other relevant authorities to ensure all needs are considered and addressed.

[9] *https://reliefweb.int/report/lebanon/water-edge-lebanons-drought-crisis-demands-immediate-international-support-2025*

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