When Bombs Turn the Taps Off

The Impact of Conflict on Water Infrastructure in Lebanon

October 2023-April 2025

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Executive summary

Action Against Hunger, Insecurity Insight and Oxfam have worked collectively to document the impact of the escalation of conflict in Lebanon on water infrastructure since October 2023. Civilians in Lebanon already faced challenges in accessing sufficient clean water at an affordable price prior to the conflict escalation. For many, these challenges have now been seriously exacerbated. Based on key informant interviews across South, Nabatieh, Bekaa and Baalbek-Hermel governorates; satellite imagery analysis; in-country partner contributions; and the remote monitoring of online sources, the research shows the following:

- Between October 2023 and November 2024, water infrastructure in Lebanon was repeatedly struck, damaged, and frequently rendered inoperable for multiple months as a result of Israeli attacks that primarily involved the use of air-launched explosive weapons. In a small number of incidents, the use of bulldozers was also reported.
- The attacks directly affecting water infrastructure were most frequent in southern Lebanese communities along the Israel-Lebanon border in Nabatieh and South governorates, where incidents were recurrent between October 2023 and November 2024. In these governorates alone at least 26 water pumping facilities associated with public networks and 28 water pipeline networks have reportedly been at least moderately damaged since October 2023.
- Incidents were also reported in Bekaa and Baalbek-Hermel governorates, but at lower levels, and were concentrated between September and November 2024.
- Some water infrastructure and associated solar panels for pumping water that were damaged or destroyed in attacks were surrounded by large open areas of agricultural land, raising questions about whether the infrastructure was directly and specifically targeted.

Long-term and foreseeable reverberating effects from the attacks:

- Large-scale disruption of water supplies has often continued many months after infrastructure was initially rendered inoperable, because security and financial barriers have prevented repairs.
- In areas most affected by water supply disruptions such as southern Lebanese border villages and towns, residents have frequently become entirely dependent on financially costly trucked-in water, while some have reportedly rationed their water intake.
- Insufficient water supplies have acted as further barriers to food production among farming and agricultural communities, many of which have also been unable to access their farmland due to insecurity.
- Damage to sewerage and water networks in some locations in southern Lebanon raises concerns about risks to public health.

"[L]ife in the town has completely changed due to a total water outage, which occurred after the solar panels powering the wells in the town were targeted. Additionally, the town has been experiencing a power outage."

Local official, Tayr Harfa village, southern Lebanon, April 2025

Introduction and context

Often known as the "water tower of the Middle East", Lebanon possesses significant water resources, including 40 rivers, 16 of which flow throughout the year.[1] As of late 2022, around 80% of Lebanese households received water via national water supply networks.[2] However, decades-long political and economic issues have created serious obstacles to reliable access to clean water. Electricity blackouts – including a nationwide outage in August 2024 – have repeatedly occurred, especially since the summer of 2021, amid the country's ongoing socio-economic crisis that started in 2019.[3] Consequently, water pumping has been disrupted and, in some cases, water authorities have requested users to ration supplies.[4] In 2022, UNICEF stated that since 2019, per capita water supplies from Lebanon's public water authorities had decreased considerably, "falling short of the 35 litres a day considered to be the minimum acceptable quantity".[5]

To compensate for the inadequacies of the public system, over 60,000 unregulated private wells have reportedly been dug, trucked-in water from private providers is common and most households use bottled water due to concerns about the quality of tap water.[6] However, the average price of bottled water increased three to five times in the year prior to April 2022, and the average price of trucked-in water increased by 50% over the same period, increasing financial barriers to water access at the same time that unemployment and inflation were rapidly increasing.[7] There are also increasing concerns about reduced rainfall levels, including a particularly dry January 2025, a month that typically falls within the rainy season, as well as significant drops in groundwater levels and low levels of water in critical reservoirs.[8]

The serious escalation of hostilities between Israel and Hezbollah-Lebanon since October 2023 and intense Israeli attacks, especially in southern Lebanon, following Israel's ground invasion that started on 30 September 2024, has severely exacerbated the challenges Lebanon faces. More than 9,000 air or drone strikes and over 6,000 instances of shelling, artillery, or missile fire have been reported in Lebanon since October 2023.[9] Israel conducted over 96% of these attacks. Around 85% of the air and drone strikes and 99% of the shelling, artillery, and missile fire occurred in the southern governorates of Nabatieh and South, which border Israel.[10] Although a ceasefire between Israel and Lebanon came into force on 27 November 2024 specifying a 60-day cessation of hostilities, over 400 Israeli-launched air or drone strikes and over 300 incidents of Israeli-launched shelling, artillery, or missile fire have been reported in Lebanon since this date.[11] Meanwhile, Israeli troops have remained in locations in southern Lebanon despite a February 2025 deadline for their withdrawal.[12]

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Israel's attacks have killed over 4,000 people in Lebanon, and almost 900,000 people had been displaced in late November 2024 following the ground invasion of southern Lebanon two months previously.[13] Simultaneously, civilian infrastructure and services designed for supporting civilians in times of crisis have been relentlessly attacked. Since 8 October 2023, Insecurity Insight has identified over 500 incidents of violence against or obstruction of access to health care in Lebanon, including the killing of over 400 health workers and damage to health care facilities on over 200 occasions.[14] Following the escalation of conflict in Lebanon, Insecurity Insight's monitoring also revealed repeated attacks on water infrastructure, which provides a resource to Lebanon's citizens that is indispensable to daily life.

Given water's significance to all aspects of life and water infrastructure's protection under international humanitarian law, Insecurity Insight joined with Action Against Hunger and Oxfam to collect further evidence on the impact of the post-October 2023 escalation of conflict on water infrastructure in Lebanon. The documented evidence is provided in this report, which focuses on the period between October 2023 and April 2025. It is based on key informant interviews across South, Nabatieh, Bekaa and Baalbek-Hermel governorates; satellite image analysis; in-country partner contributions; and remote monitoring of online sources.

Report outline

This report is divided into three main sections. The first demonstrates the devastating extent of the damage to and destruction of water infrastructure such as pumping stations and networks of water pipelines in Lebanon, with reference to specific examples of reported conflict incidents directly affecting water infrastructure. The second section considers the reverberating effects of these attacks. Finally, conclusions and recommendations are given. An outline of the legal framework protecting water infrastructure in armed conflict and the methodology used, including details on key informant interviews, is available in the appendix.

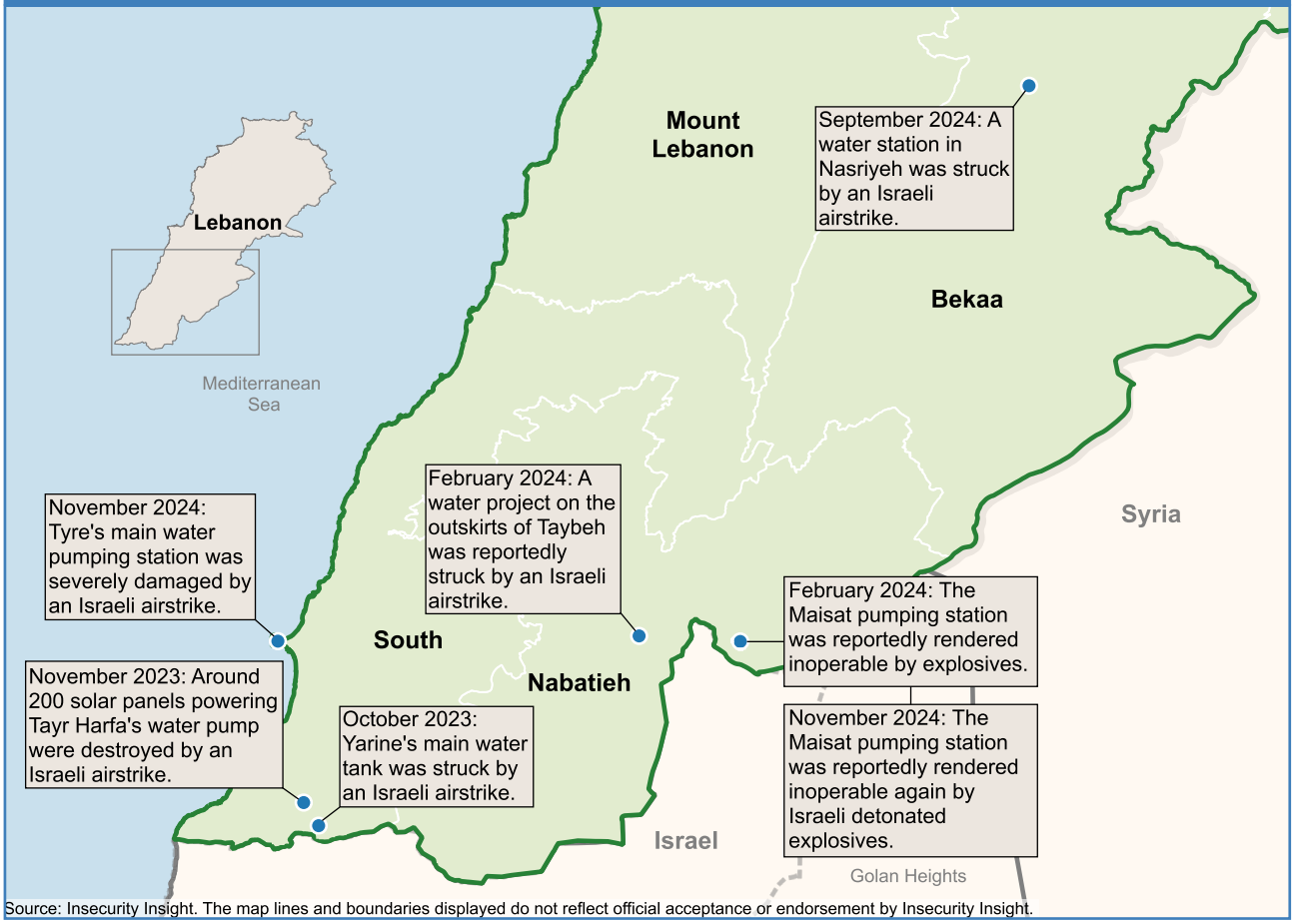
The event-based data included in this report is available for download via the **Humanitarian Data Exchange** (HDX).

The reported extent of damage to and destruction of water infrastructure in Lebanon

In line with the overall geographic concentration of Israel's military campaign in Lebanon, conflict incidents directly affecting Lebanon's water supply system have been most frequently recorded in Nabatieh and South governorates, often close to the Israeli border. They were reported repeatedly between 8 October 2023 and November 2024 and have affected infrastructure that includes water distribution pipelines, water tanks and water pumping stations, and energy stations and solar panels used to power pumping stations.

Mass forced displacement orders for communities in southern Lebanon mean that only a limited number of people are likely to have witnessed and reported on the precise details of specific conflict incidents that directly affected water infrastructure. As such, damage assessments, however limited their information is on exactly how or when infrastructure was damaged, are likely to provide a greater overall account of the extent of the conflict's impact on Lebanon's water infrastructure than reports of individual incidents. According to a March 2025 World Bank report, around "64% of community water supply distribution reservoirs, 46% of water reservoirs, 58% of water pumping stations, and 23% of water treatment plants, have been destroyed or partially damaged" in Lebanon.[15] Overall, according to the UN, 46 of Lebanon's water facilities have been damaged.[16]

Figure 1: Examples of reported conflict incidents directly affecting water infrastructure in Lebanon since 8 October 2023



Source: Insecurity Insight. The map lines and boundaries displayed do not reflect official acceptance or endorsement by Insecurity Insight.

Available information suggests that the majority of damage has been caused by explosive weapons use. The overall extent to which the water infrastructure was subjected to directly targeted strikes or was damaged due to the wide blast radius and wide-area effects of the detonation of explosive weapons remains unclear. However, as satellite imagery given below shows, in at least several incidents the damaged or destroyed facilities were located in large open areas without clearly identifiable military targets, suggesting that in some cases they may have been specifically and deliberately targeted.

As well as the damage to water infrastructure, several water supply system staff are reported to have been killed in Lebanon since October 2023. One of these individuals was reportedly killed while working for the South Lebanon Water Establishment (*Établissement des Eaux du Sud-Liban* in French) by an Israeli drone strike in Naqoura, South governorate, in June 2024.[17] Additionally, a municipal worker in Nabatieh el Fawqa was reportedly killed in an airstrike in May 2025 while working on the public water supply system.[18]

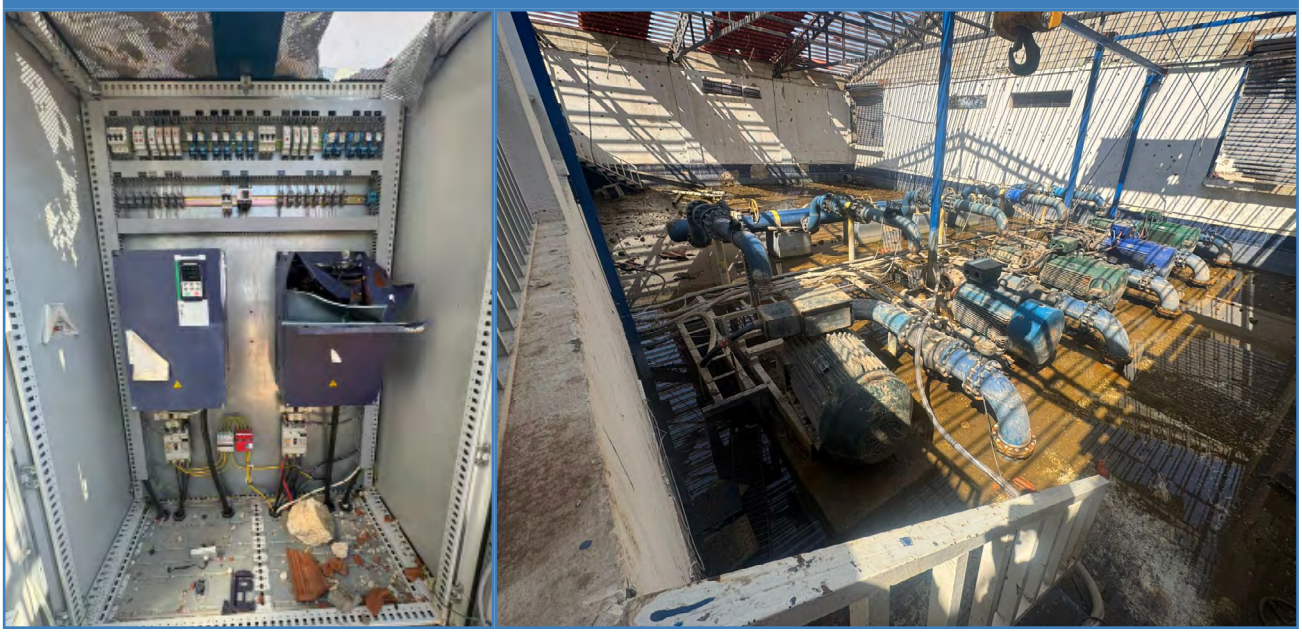
Reported water-related incidents and damage in Nabatieh and South governorates

Incidents in which Israeli explosive weapons struck water pumping stations are among the most notable, given that the continued flow of water supplies to other areas depends on these pumping stations working properly. As such, compared with damage to water pipelines, the damage to and destruction of water pumps may have particularly large and long-term reverberating effects – including disruptions to the supply of water to the people they normally serve – beyond the initial time of the attack.

The Maisat water pumping station and the associated Wazzani water intake centre in Nabatieh governorate have suffered particularly significant damage, and have at times been completely destroyed (see Figure 3).[19] In normal times, the Wazzani water intake centre receives water from a spring linked to the Hasbani River and feeds it to the Maisat water pumping station, which is around one kilometre away (as shown in Figure 2). In turn, the Maisat water pumping station supplies water to around 150,000 people in over 30 villages and towns in the surrounding areas.[20]

Figure 2: Satellite image showing the locations of the Wazzani water intake centre and the Maisat water pumping station

Figure 3: Images showing severe damage to the Maisat water pumping station in Nabatieh governorate



Source: © Action Against Hunger

Satellite imagery of the Maisat water pumping station reviewed by the report authors shows that the roof of the main pumping station room, a building containing a water testing laboratory and a raised water tower, has been severely damaged. The raised water tower had already been damaged during the 2006 Israel-Lebanon conflict and had not been functional since then. Additionally, as shown in Figure 4, one of the water tanks at the Maisat water pumping station has been seriously damaged and has a large hole in its wall. It is unclear exactly how and when all of the damage to these structures was sustained. However, according to local media, in early February 2024 Israeli drone-launched explosive weapons struck the pumping station, rendering it inoperable for around two months, until repairs restored some operations at the start of April 2024.[21] Israeli explosive weapons caused further serious damage in early November 2024, putting the pumping station out of action again.[22] Bulldozers are also reported to have caused some damage to the pumping station, and the Israeli armed forces are known to have used tanks and dug trenches in close proximity to the facility.[23] Notably, the severe damage to the facility occurred despite its location in open agricultural land, with the closest buildings to the pumping complex being approximately 160 metres away.[24]

Figure 4: Photo showing damage to the water tank at the Maisat water pumping station

Source: WaSH Sector Lebanon

After being struck and damaged by explosive weapons in November 2024, the Maisat water pumping station remained out of operation around five months later in April 2025. Consequently, running water was unavailable for the approximately 40 remaining families living in the immediate area as of the end of March 2025, as well as those in surrounding areas who are dependent on water pumped from Maisat.[25] Local officials stated that ongoing concerns about insecurity and the substantial financial cost and rehabilitation investment required was preventing full repairs to the pumping station.[26]

As the photo in Figure 5 shows, the Wazzani water intake centre has also been completely destroyed. This reportedly occurred in the period between Israel's ground invasion of Lebanon in late September 2024 and the declaration of the ceasefire in late November 2024. It is unclear exactly what caused this destruction, but Israeli ground forces are known to have operated in the area during this period. As of late May 2025, the Wazzani water intake centre – from which the Maisat water pumping station is supposed to receive water – remained non-operational.[27]

The events at Maisat and Wazzani are not unique. In November 2024, the main water pumping station in Tyre in South governorate was also struck by an Israeli airstrike and severely damaged (see Figure 6), disrupting water access to 72,000 people. Although the buildings associated with the pumps still needed to be rebuilt, temporary repairs enabled some water access to be restored around a month later.[29] Overall, as shown in Figure 7, damage assessments by partner contributors show that at least 26 publicly operated water pumping facilities in southern Lebanon in the Bent Jbeil, Tyre, and Marjayoun districts of South and Nabatieh governorates have suffered at least a moderate level of damage since October 2023.[30] As indicated in Figure 7, the majority of these facilities lay within around five kilometres of the Israeli border, where Israeli use of explosive weapons has been extremely intense since October 2023.[31]

Figure 5: Photo taken in March 2025 showing the destruction of the Wazzani water intake centre[28]

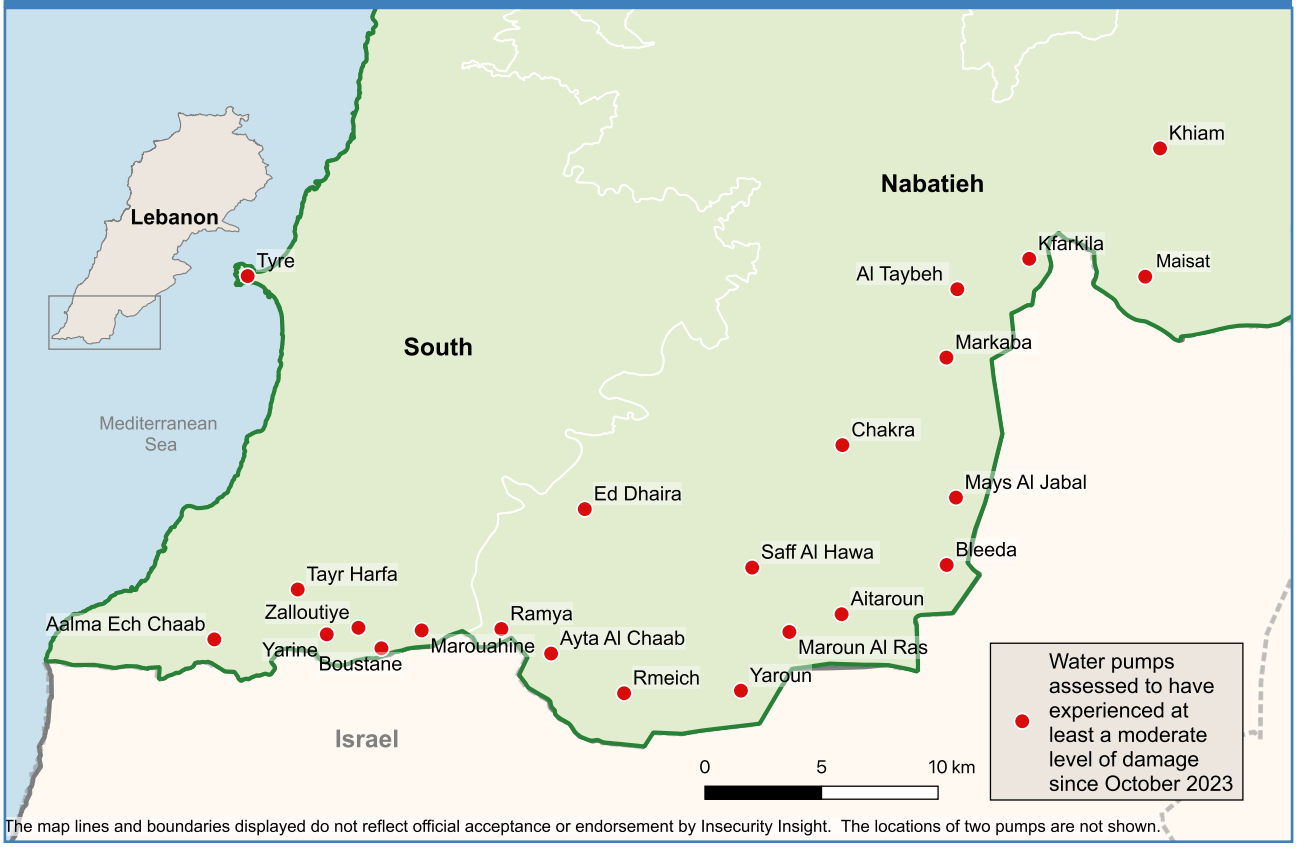
"No water is reaching any of the current residents – around 40 families – through the existing network."

Wazzani local official, late March 2025

Figure 6: Images of the water pumping station in Tyre, South governorate, following its destruction in an airstrike in November 2024

Figure 6: Images of the water pumping station in Tyre, South governorate, following its destruction in an airstrike in November 2024

Figure 7: Water pumping facilities in South and Nabatieh governorates assessed to have sustained at least moderate damage since October 2023



Source: South Lebanon Water Authority technical assessment

Figure 8: Images showing the destruction of solar panels that previously provided power to supply water to Tayr Harfa, South governorate

Source: © Action Against Hunger

In addition to water pumping facilities, energy infrastructure used to power water pumping systems has been damaged or destroyed. In early November 2023, around 200 solar panels in Tayr Harfa, a village approximately two kilometres from the Israeli border, were reportedly destroyed by an Israeli airstrike. The destruction is visible in the satellite images of the site before and after the airstrikes reviewed by the report authors. The solar panels supplying water to Tayr Harfa from wells were located on top of a hill in a large area of open space over 200 metres from the nearest visible building, which suggests that the solar panels may have been specifically and deliberately targeted.[32] The solar panels had previously been used to supply naturally sourced water to the village's 4,000 residents and had ended residents' previous dependence on expensive privately trucked-in water.[33] Moreover, they were fully installed only a year before their destruction as part of a project self-financed by residents at a cost of US$130,000.[34] Almost a year and a half after the solar panels were destroyed, running water was still not available to residents of the village.[35] As a result, the small remaining population was again dependent on buying expensive tucked-in water or using agricultural tractors to transport water tanks filled at distant locations.[36]

Similar interruptions to water supplies were reported in other locations in southern Lebanon due to damage to or the destruction of solar panels. For example, in November 2024, Israeli airstrikes reportedly damaged the solar-powered system at the Rmeich pumping station, reportedly "disrupting water access for an estimated 1,325 households".[37] In total, at least seven solar panel farms in Nabatieh and South governorates linked to publicly operated water facilities are assessed to have sustained at least moderate damage since October 2023.[38]

"[L]ife in the town has completely changed due to a total water outage, which occurred after the solar panels powering the wells in the town were targeted. Additionally, the town has been experiencing a power outage."

Local official, Tayr Harfa, April 2025

Key informant interviews suggest that multiple incidents directly affecting water infrastructure have been reported in several communities, especially those close to the border. In Yarine, South governorate, the town's main water reservoir was destroyed in an Israeli airstrike in October 2023 and the only water source – an artesian well – has reportedly also been destroyed.[39] Similarly, in Naqoura, South governorate, the two water sources – two artesian wells – were reportedly destroyed, and in Aitaroun, Nabatieh governorate, multiple wells were "completely destroyed" in addition to large-scale damage to the water pipeline network and purification station.[40] As a result, running water was not available to residents who still remained in these locations, and they were instead reliant on purchasing water from private wells in nearby villages and transporting it to their homes, in some cases using rented equipment. In Naqoura, the municipality had also rented an electricity generator and connected it to the water pump serving one of these wells. This came at substantial financial costs to residents, many of whom were already suffering economic hardship.[41]

"Both water sources were directly targeted, in addition to severe damage sustained by a large part of the network. This resulted in significant disruptions to water availability, [because] there is no longer any effective water production source to meet the needs of the population."

Local official, Naqoura, April 2025

Even if pumping stations remained intact, water pipelines and distribution networks often experienced large-scale damage. Since October 2023, at least 24 water pipeline networks associated with public water supplies across Bent Jbeil, Tyre, Marjayoun and Tyre districts are assessed to have experienced serious damage. A further four are assessed to have been moderately damaged.[42] Notably, in October 2024, the main water distribution route from the Litani River to the Qasmieh irrigation project in Erzi was reportedly bombed by Israeli forces. In normal times, the distribution channel supplied 260,000 cubic metres of water a day to irrigate approximately 6,000 hectares of agricultural land along the southern Lebanese coast for crops such as bananas, citrus fruits, tomatoes and lettuces.[43]

Although reported incidents of violence directly affecting Lebanon's water infrastructure were primarily concentrated between October and November 2024, at least one such incident has been reported since the 27 November 2024 ceasefire. In early February 2025, Israeli forces reportedly bulldozed and destroyed a water reservoir in Kfar Chouba, Nabatieh governorate.[44]

Reported incidents in Bekaa and Baalbek-Hermel governorates

Although specific conflict incidents directly affecting water infrastructure have been reported at lower levels compared to those in Nabatieh and South governorates, damage to water infrastructure was also reported in Bekaa and Baalbek-Hermel. These incidents coincided with a dramatic increase in Israeli air-delivered explosive weapons strikes in Baalbek-Hermel and, to a lesser extent, Bekaa between September and November 2024.[45]

Reported incidents include a water station in Nasriyeh town in Bekaa being struck by an Israeli airstrike in September 2024 and damage from shelling to a two-kilometre-long water pipeline between the villages of Flawiye and Bodai in Baalbek-Hermel in the same month.[46] One of the six wells in Schmustar, Baalbek-Hermel, has also been severely damaged and five others have been damaged to a lesser extent, affecting 300 households.[47] High resolution satellite imagery reviewed by the authors of this report also appears to show large-scale damage to a borehole in Schmustar.

The satellite imagery indicates that the borehole was isolated and surrounded by agricultural land used by civilians to grow crops. This suggests that, like the water infrastructure referred to previously, it is possible that the borehole may have been deliberately and specifically targeted.

Damage to solar panels sustained from conflict-related actions has reportedly disrupted water supplies in Bekaa and Baalbek-Hermel governorates.[48] Among ten incidents in these governorates where Oxfam-supported water-related infrastructure was damaged or destroyed by airstrikes between September 2024 and October 2024, seven affected solar panels forming part of water infrastructure. This includes incidents in which reported airstrikes occurred in the vicinity of the water infrastructure rather than directly striking it.

Although compared with Nabatieh and South governorates the overall extent of reported damage to water infrastructure in Bekaa and Baalbek-Hermel governorates is lower, water supplies have also been seriously disrupted in these locations.[49] In Schmustar in Baalbek-Hermel, for example, a water tank could only be filled to around 20% of its capacity following damage sustained from the conflict.[50] The following section provides further details on the impact of the conflict on people's ability to access water.

"People now receive much less water than before, and they often have to wait longer or travel further to get it. Some families are relying on water trucking, while others have started rationing their daily usage."

Carpenter unemployed since October 2023, Baalbek, April 2025

Assessing the reverberating effects of damage to and destruction of water infrastructure in Lebanon

The full effects of an attack that damages water infrastructure are often not felt at the time of the attack itself. Instead, they often reverberate over many months or even years beyond the attack itself. At least four reverberating effects of the attacks are already identifiable in Lebanon.

Long-term disruption of supplies of running water

Firstly, the publicly operated water supply system has been severely disrupted by damage to and the destruction of water infrastructure, especially pumping stations and the associated energy infrastructure such as solar panels used to operate them. Frequently, running water has remained unavailable for months after water infrastructure was initially damaged or destroyed. This applied in towns and villages including Kfour, Naqoura, Al-Jibbain, Kfar Reman, Yarine, Al-Duhayra, Wazzani, Yohmor, Tayr Harfa, and Doueir, all of which are in either Nabatieh or South governorate, primarily close to the Israeli border. Many of these locations use locally based artesian wells to obtain water. As such, local-level repairs are required to restore running water supplies in each of these locations due to the lack of a single external water source.

In a minority of cases such as in Tyre, water infrastructure has been repaired sufficiently to allow some services to resume.[51] However, even where limited repairs such as these have been possible, the water networks and distribution pipelines are likely to have remained damaged, reducing the availability of water supplies. In several locations, including Wazzani and Yohmor in Nabatieh governorate, local officials stated that the continued presence of Israeli forces and concerns about ongoing conflict violence were preventing repair efforts.[52] The local public water supply services have also reportedly struggled to gain access to water sources to carry out work due to ongoing attacks and insecurity, which, as noted earlier, has killed multiple public water services staff.[53]

Dependence on trucked-in water and other private water sources

Secondly, in places where supplies of running water have been interrupted, communities have become heavily dependent on private water sources or on purchasing trucked-in water. Even in villages such as Alma al-Shaab, where an artesian well was repaired, a municipal tanker was still required to supply water, and even with this service, demand for water exceeded supply.[54] Moreover, trucked-in water comes at considerable financial cost in a period when many people have lost their jobs due to conflict-related issues. As of April 2025, people in Al-Jibbain were reportedly paying US$15 for 4,000 litres of water from local suppliers.[55] According to the World Bank, trucked-in water costs households ten times more than water

obtained from public water supply authorities.[56] In some cases these authorities have also provided trucked-in water, but their access to communities has been limited by ongoing insecurity.[57] In Baalbek, as well as people relying on trucked-in water, some households have reportedly rationed water supplies.[58]

Challenges for irrigating farmland

Thirdly, farmers have experienced barriers that prevent them from accessing sufficient water to irrigate their crops. More than 82% of the farmers who were interviewed for this report stated that since October 2023 they had experienced difficulties accessing sufficient water to irrigate crops or provide drinking water for livestock.[59] These interviewees farmed areas in Khiam, Aitaroun, Bodai, Saydeh and Bent Jbeil. Although some referred to low rainfall as a contributing factor, these farmers stressed that disruptions to running water supplies had exacerbated the seriousness of the situation. This compounds difficulties for farmers resulting from other conflict-related factors. FAO surveys between 23 October and 1 November 2024 suggested that of over 4,000 agricultural households interviewed across 12 priority districts of Lebanon, 90% anticipated losses to agricultural production due to the effects of the conflict.[60]

Increased burden on Lebanon's state and water authorities' finances

Fourthly, the overall economic cost of repairing water facilities damaged or destroyed in the conflict adds to the burden on Lebanon's state finances, which had already been weakened since the 2019 socio-economic crisis. Evidence of the impacts of armed conflict from other Middle East settings highlights that water service authorities may struggle further to recover from the damage caused by the conflict due to the water that is lost when infrastructure is damaged. This leads to an increase in what is known as "non-revenue water", i.e. water that is lost or unaccounted for before it reaches the end consumer, and that consumers can therefore not be charged for. This in turn leads to lower revenue inflows to water supply services during conflict at the same time as their costs are increasing due to the repairs they have to somehow pay for.[61]

According to the World Bank, conflict in Lebanon has created losses estimated at US$171 million across the water, wastewater and irrigation sectors. This includes a US$24 million increase in operating costs for local water supply services because of the need to repair damage to the water supply system, a US$7 million revenue loss because households have not been supplied with water that can be charged for due to damaged water supply networks (wells, pumping stations, pipelines, household connections, etc.), and US$140 million in losses from households' increased reliance on trucked-in water purchases rather than using water supplied by public water authorities.[62]

"[T]he [W]azzani spring pumping stations were hit by explosive weapons, and the water networks were also damaged, affecting the adequate supply of water to the crops."

Farmer, Khiam, Nabatieh governorate, April 2025

Potential further long-term and foreseeable reverberating effects of conflict

Beyond the already identifiable reverberating effects discussed above, it is possible that further long-term impacts will emerge from the damage to water infrastructure. As highlighted by key informants and Human Rights Watch research, a serious risk is long-term forced displacement, because if communities cannot access running water or affordably find alternative supplies of water for their daily needs or for irrigating farmland, they may feel compelled to permanently settle in other locations.[63] This could have a range of social and economic consequences for both the communities they move to and the areas they have left.

Furthermore, evidence from Ethiopia, Ukraine and the Middle East demonstrate clear links between damage to water and sanitation infrastructure during conflict and adverse public health outcomes.[64] Studies show that there is a particular public health risk when people are "exposed to water supplies ... contaminated by untreated wastewater".[65]

Water-borne and water-related illnesses were not reported by people interviewed for this report, but some highlighted the limited resources available for testing water quality and possible contamination.[66] Moreover, concerns have been raised over the possible contamination of water by white phosphorus, the use of these munitions in Lebanon having been verified by Human Rights Watch.[67] Additionally, there is a risk that residents may resort to using unsafe water sources due to limited supplies, a situation exacerbated by low rainfall and water shortages at critical reservoirs, especially during the dry season (June-September).[68] Local officials interviewed for this report also highlighted damage to the sewerage network in Naquora, Wazzani, Toul and Kfour, where "foul odours" have reportedly been identified.[69] This, combined with the known large-scale damage to water infrastructure and the possibility that damaged sewerage infrastructure has contaminated water sources, suggests there are potentially negative long-term reverberating effects on health if the water supply crisis is not adequately addressed. It is therefore clear that the provision of timely and effective support to mitigate these risks can avert a predictable rise in water-borne illnesses.

"[P]eople [are] facing difficulties to go back to their lands because of the absence of water supplies, [those] who [are] going back [are] relying on trucked-in water."

Lebanese water official, April 2025

Conclusions

Civilian infrastructure for pumping, storing, and distributing water was repeatedly struck by Israeli explosive weapons between October 2023 and November 2024. The repeated nature of the incidents indicates that, despite the known wide-area effects of explosive weapons and the status under international law of water installations as objects indispensable to the survival of the civilian population, the implementation of precautionary measures to protect this infrastructure have not been prioritised. The location of some of the damaged and destroyed infrastructure in large areas of open agricultural land suggests that some of this infrastructure may have been deliberately and specifically targeted. The reverberating effects of repeated attacks on water infrastructure and the associated harm inflicted on civilians were clearly foreseeable. Equally, evidence from other armed conflicts in the Middle East underscores the potential for further long-term reverberating effects such as those relating to public health arising from damage to water infrastructure.

Despite the ceasefire, Israeli attacks have continued and the Israeli armed forces have maintained their presence on Lebanese territory, especially in the south of the country, limiting displaced residents' ability to return to their homes. Even if they do return to their homes after being displaced, their inability to easily access safe water supplies makes resuming normal life virtually impossible for many people. The persistent failure to end the decades-long conflict in the region has created a culture of impunity. Only through a full and permanent cessation of hostilities by all conflict parties can the reconstruction and repair of water infrastructure be fully pursued and a semblance of normalcy be provided to the lives of communities that have lost so much.

Recommendations

To UN member states and advocates attempting to permanently end hostilities and impunity and uphold IHL:

- Call on all parties to the conflict to strictly comply with the ceasefire agreement, fully adhere to IHL, and ensure the protection of civilians, health workers, and essential infrastructure. Since the 26 January 2025 ceasefire extension, over 460 Israeli-launched air or drone strikes and over 200 Israeli-launched shelling, artillery or missile strikes have been reported in Lebanon.[70]
- Call on all parties to the conflict to refrain from actions that would exacerbate the suffering of innocent civilians and impede humanitarian access for the delivery of assistance to the most vulnerable.
- Continue to publicly call for the full withdrawal of Israeli forces from Lebanese territory as a crucial component of the ceasefire agreement.
- Support the establishment of independent, impartial, and transparent investigations into all allegations of IHL violations consistent with due process and general principles of law.
- Highlight the severe levels of damage to water infrastructure in Lebanon to the UN Special Rapporteur on the Rights to Water and Sanitation and the imperative for urgent action to address this.
- Urge third state parties to utilise all possible means to consistently uphold IHL. This includes leveraging diplomatic channels and political influence to foster compliance with IHL, particularly when these states are confronted with credible reports of significant IHL violations, with the ultimate aim of preventing and halting such violations.
- Ensure that Lebanon does not become a forgotten humanitarian crisis by highlighting the recent conflict's effects on the civilian population as well as the severe levels of damage to water infrastructure and disruptions to water supplies in both public and private advocacy with key stakeholders.
- Push for enhanced humanitarian and development material support to address Lebanon's heightened humanitarian needs.
- Continue to call for unrestricted access to humanitarian aid.

To humanitarian programmers and donors:

- Support the rehabilitation and operationalisation of conflict-affected water infrastructure, prioritized based on safe water access and water security needs and implemented with the active participation of Water Establishments and local communities.
- Ensure temporary access to safe water and basic sanitation services, through the provision of water trucking, emergency water points, and safe wastewater discharge (desludging), supported by an effective deconfliction mechanism to guarantee uninterrupted service delivery in insecure areas.

- Strengthen regular monitoring and surveillance systems for water quality and wastewater, ensuring continuous access to safe water and reducing public health risks through comprehensive testing campaigns.
- Support and establish remote digital management and community-based monitoring systems, including Supervisory Control and Data Acquisition (SCADA) and locally managed Community Feedback and Response (CFRM) mechanisms, minimizing on-site operator presence in conflict affected areas and enhancing real-time water security oversight.

To signatories to the Political Declaration on Strengthening the Protection of Civilians from the Humanitarian Consequences Arising from the Use of Explosive Weapons in Populated Areas:

- Uphold and implement commitments under the Political Declaration to strengthen the protection of civilian objects, including water installations, during and after armed conflict that involves the use of explosive weapons.
- Continue to promote and disseminate the Political Declaration among all relevant stakeholders and underscore the serious and long-term reverberating effects of the use of explosive weapons in proximity to water installations and infrastructure.

Appendix

Methodology

The event-based data in this report on conflict incidents directly affecting water infrastructure in Lebanon is based on open-source news monitoring, data extracted from the **Armed Conflict Location & Event Database** and **Insecurity Insight's Security in Numbers Database**, and partner contributions. It covers the period from 8 October 2023 to 30 April 2025. Sources were cross-checked to identify duplicate events. The incidents have not been independently verified. The extent and accuracy of event-based data, including information on the dates and locations of specific incidents in which water infrastructure was directly affected by conflict violence, are limited by significant reporting barriers. Forced displacement orders for communities in southern Lebanon mean that only a limited number of people are likely to have witnessed and reported on the specific details of conflict events and the infrastructure directly affected during them. As such, damage assessments since October 2023 of water infrastructure in Lebanon referred to in this report (but which lack details on exactly how or when such infrastructure was damaged or destroyed) are likely to provide a greater overall account of the extent of the conflict's impact on Lebanon's water infrastructure.

Satellite images from Airbus and accessible via Google Earth Pro were analysed to help verify some of the reported incidents.

Additionally, 33 semi-structured key informant interviews were conducted specifically focusing on the impact of the conflict on water infrastructure in Lebanon. These interviews were conducted between March and April 2025, and focused on Lebanon's South, Nabatieh, Bekaa, and Baalbek-Hermel governorates. A further 69 key informant interviews were conducted that focused on understanding the impact of conflict escalation on food security and affected communities. In total, 78 individuals were interviewed. Interviewee profiles included farmers and agricultural workers, members of affected communities, mayors and local authority officials, and individuals with specific expert knowledge on Lebanon's water infrastructure. The key informant interviews were limited by the unique experiences of individual key informants and their personal biases and perceptions, which may have been influenced by potential conflict-induced trauma.

Independent IHL specialist lawyers provided legal advice and a legal review of the analysis.

International humanitarian law and damage to and destruction of water infrastructure in Lebanon

Under international humanitarian law (IHL) – which is the body of law governing armed conflict – parties to a conflict are obliged to protect civilian infrastructure such as water infrastructure and related installations. Significant reporting barriers make it difficult to fully determine the exact circumstances surrounding documented attacks on water infrastructure in Lebanon since October 2023. These constraints may preclude a conclusive assessment of whether specific incidents constitute violations of IHL by the parties to the conflict. However, the significant destruction that can be observed, including to facilities located in large areas of open space distant from clearly identifiable military objects, underscores the critical need for upholding IHL principles relating to the protection of civilian infrastructure and the conduct of hostilities.

The principle of distinction

According to IHL, parties to a conflict must always distinguish between lawful military targets and civilians and civilian objects.[71] This requirement is known as the principle of distinction. Deliberately targeting civilians and civilian objects is prohibited and amounts to a war crime.[72] The various kinds of water infrastructure are protected as civilian objects under IHL and must never be attacked. Water infrastructure also benefits from a presumption of civilian status. As such, in situations where there is doubt regarding whether such an object constitutes a legitimate military target, it must be treated as civilian, and conflict parties must protect it from attack.[73]

Civilian objects may temporarily lose their protection against attacks if and for such limited time as they are used for military purposes. Yet even then, attacks on civilian objects are only permissible if they comply with the IHL principles of proportionality and precautions (see below).

In addition to the general protection afforded to all civilian objects during armed conflict, drinking water installations, supplies, and irrigation works benefit from special protection under IHL. This is because they are classified as “objects indispensable to the survival of the civilian population” and, as such, must never be attacked, destroyed, removed or rendered useless.[74] The types of objects covered by this IHL rule could also include types of energy infrastructure (e.g. solar panels) on which objects indispensable to the survival of the civilian population depend. Attacks against these objects are only permitted in terms of narrowly defined exceptions, i.e. when the objects are directly supporting military action or are used exclusively to sustain enemy armed forces.[75] It can reasonably be assumed that drinking water installations are unlikely to be used solely for the benefit of armed forces. However, even if these exceptional cases applied, IHL explicitly prohibits any action against these objects which “may be expected to leave the civilian population with such inadequate food or water as to cause its starvation or force its movement”.[76]

The principle of proportionality

The principle of proportionality strictly prohibits conflict parties from launching an attack that may be expected to cause civilian harm (e.g. incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof) that would be excessive in relation to the concrete and direct military advantage that might be obtained.[77] This assessment must be conducted for each specific attack rather than the broader military campaign. Knowingly launching an attack that will cause clearly excessive civilian harm constitutes a war crime.[78]

Furthermore, it is increasingly accepted that the reverberating effects of attacks should be included on the "expected civilian harm" side of the proportionality assessment.[79] Reverberating effects may include the foreseeable consequence that civilians may no longer have access to sufficient and safe water due to the degradation of water infrastructure. Once essential civilian infrastructure has been damaged, the civilian harm resulting from its further destruction may become more foreseeable due to the lack of alternatives. For instance, if most water facilities in an area have already been rendered inoperable, an attack on one of the remaining functioning installations will have a foreseeably severe impact on large numbers of civilians.

External assessments of compliance with proportionality are limited because they are made after the fact and lack access to the classified intelligence available to military decision-makers. However, consistently targeting water facilities and other related infrastructure and thus leaving affected populations without water is unlikely to meet the proportionality test owing to the foreseeable and excessive harm to the civilian population resulting from these attacks.

The principle of precautions

Even when a military target is lawful and the anticipated civilian harm is deemed proportionate, conflict parties carrying out attacks are still required to take all feasible precautions to avoid or minimise harm to civilians and damage to civilian infrastructure, including water facilities.[80] "Feasible" refers to what is practically achievable, based on the conditions at the time of an attack, and requires balancing humanitarian concerns and military imperatives. This includes the following:

- **Verifying targets:** Parties must do everything possible to confirm that a target is a legitimate military objective, using the best available intelligence. Civilian objects, including water infrastructure, must be presumed civilian if there is any doubt as to their status.[81]
- **Minimising harm:** Attacks must be planned and carried out to reduce risks to civilians. This includes making careful decisions about the weapons used and the timing of attacks, and choosing locations for attacks that limit harm to civilians or civilian objects. The precision of weapons and their range should be considered so as to minimise harm to civilian objects while attacking legitimate military targets. The extensive use of explosive weapons with wide area effects in close proximity to civilian objects including water infrastructure (documented in this report) highlights the need for compliance with the principle of precautions.[82]
- **Cancelling attacks:** If it becomes obvious that a target is not lawful or the expected civilian harm would be excessive, the attack must be halted or suspended.

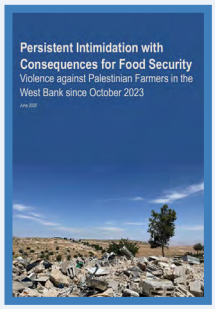
Moreover, conflict parties must take all feasible precautions to protect civilian and civilian objects under their control, including water infrastructure, against the effects of attacks.[83] This means, for instance, avoiding positioning military objects in the vicinity of water infrastructure.[84]

Importantly, even if one conflict party fails to fulfil its obligation to take precautions against the effects of attacks, this does not absolve the other party of its responsibilities to adhere to the principles of distinction, proportionality, and precautions, which remain applicable in all circumstances.[85] The Israeli military has claimed that Hezbollah is hiding both personnel and weapons among civilians and civilian objects. Even if this claim is substantiated, such conduct does not relieve Israel of its obligation to comply with the duty to take all feasible precautions and satisfy the other binding obligations of distinction and proportionality.

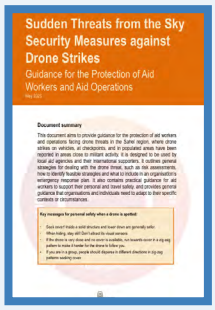
Other resources

The Safeguarding Health in Conflict Coalition (SHCC) identified 485 incidents of violence against or obstruction of health care in Lebanon in 2024, compared to 18 in 2023. At least 408 health workers were killed and 419 injured. Emergency medical services were attacked on at least 310 occasions and health facilities damaged at least 208 times. The health care system was attacked by Israeli airstrikes, resulting in a severe humanitarian crisis and deflated economy. Read the full factsheet: **Arabic; English**. Download the **data**.

Since October 2023, Palestinian farmers in the West Bank have faced repeated attacks, threats, and intimidation—primarily by Israeli settlers and, to a lesser extent, Israeli security forces—undermining their livelihoods and food security. Insecurity Insight's **documentation** shows that between October 2023 and December 2024, at least 276 violent incidents were reported, often involving firearms, physical assaults, and destruction of property. Attacks intensified during the October 2024 olive harvest. This violence, compounded by restricted land access, has forced displacement and deepened food insecurity across affected communities. Read the **full report**.



Armed drones are an escalating threat in humanitarian settings, with their use expected to grow. Once rare, they are now a defining feature in modern conflicts. Adapting to the growing threat of drones means rethinking security risk measures in high-risk contexts. Their appeal is clear: drones are low cost, easy to operate, widely available, and carry no pilot risk. But for humanitarians on the ground, they represent a deadly challenge – particularly when aid efforts take place near suspected insurgents. Adapting to the growing threat of drones means rethinking security risk measures in high-risk contexts. This practical guide by Insecurity Insight brings together current best practice and is available in **Arabic**, **Burmese**, **English** and **French**.



Conflict and Hunger website

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