

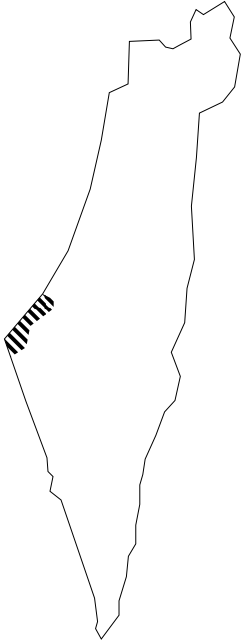
CASE 4. Essential infrastructure:

The targeting of wastewater
plants in Gaza
(Palestine, 2014)

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COUNTRY

Palestine

**PERPETRATOR**

The Israeli Defence Forces (IDF)

ACT

targeted water and sewage systems and electricity grids through airstrikes

OBJECTIVES*

- to 'collectively' punish the Gazan population

** As far as we have been able to discern; the list may not be exhaustive in this regard*

CONSEQUENCES

The death of many civilians upon impact of airstrikes

Damage to water infrastructure (e.g. water reservoirs, desalination plants, wastewater treatment plants, pumping stations)

- ↳ contributing to decreased availability of safe (drinking) water
 - ↳ a rapid increase in water-based diseases (e.g. salmonella, typhoid, kidney diseases)
 - ↳ contributing to child development issues (e.g. stunted growth, polio, malnutrition)
- ↳ leading to more expenses for safe water

Damage to the electricity infrastructure

- ↳ contributing to inability to run wastewater pumping
 - ↳ contributing to decreased availability of safe (drinking) water
 - ↳ a rapid increase in water-based diseases (e.g. salmonella, typhoid, kidney diseases)
 - ↳ contributing to child development issues (e.g. stunted growth, polio, malnutrition)

Release of raw sewage into Mediterranean waters

- ↳ causing environmental damage
 - ↳ leading to loss of livelihood for fishermen

The Gaza Strip, a self-governing Palestinian territory, 41 kilometres long and between 6 and 12 kilometres wide, is one of the most densely populated areas of the world, with population estimates of over 2 million. The narrow strip of land has been witnessing conflict since the region gained independence from British and French rule; the Strip was governed by Egypt between 1948 and 1967, then by Israel, until Palestine was granted authority in 1994 through the Oslo Accords. Despite Israeli disengagement in 2005, the United Nations still considers the territory a part of Israel, since it maintains direct external control over the Strip, and is thereby able to exercise control over a majority of aspects of life in Gaza. Between 2007 and 2014, Gaza was governed by Hamas, an Islamic fundamentalist organisation, classified as a terrorist entity by Israel, the US and the EU. When Hamas came to power, Israel swiftly imposed a blockade on Gaza, restricting the movement of goods and people. Hamas and Israel fought a brief conflict in 2014, with the Israelis attempting to end rocket fire from Gaza, and Hamas militants fighting to end their isolation.

4.1 Case: 'Collective punishment'

While tensions were brewing for weeks in Gaza, the warplanes flying overhead on 12 July 2014 brought new despair to the residents of the Strip's western districts. The Israeli offensive 'Operation Protective Edge' had begun 6 days

before and had already injured over 1,000 civilians and claimed more than 145 lives, including 28 children. The operation's airstrikes on 12 July, targeting essential water and sewage systems, caused a new disaster in the area. A day earlier, Palestinian officials had claimed that Israel had deliberately targeted 2 wells and 5 water pipelines, affecting as many as 100,000 Gaza civilians (Omer, 2014). To make matters worse, intensified fighting prevented mechanics from carrying out essential repairs. Following the deaths of several municipal water technicians, Gaza's water service provider suspended all field operations (International Committee of the Red Cross [ICRC], 2014).

Guillaume Pierrehumbert, a water and sanitation expert at the International Committee of the Red Cross (ICRC), said:

Gaza's water system has been deteriorating for years. The latest attacks are the last straw. Safe drinking water is becoming increasingly scarce in the Strip, just as temperatures are soaring. Water is becoming contaminated and sewage is overflowing, bringing a serious risk of disease. (ICRC, 2014)

In addition, the Israeli attacks caused widespread damage to Gaza's already frail and dilapidated electrical grid. Most notably, on 29 July, the Israeli Defence Forces (IDF) bombed Gaza's only power plant, knocking it out of commission indefinitely. As a result, residents in Gaza only received about six hours of electricity daily at best. Lack of power in turn led to the shutdown of water treatment plants, while Israeli tank fire put Gaza's largest sewage treatment plant out of commission. Other Israeli attacks also caused extensive damage to Gaza's water and sewage systems, leading to the release of raw sewage into open pools, farmland and the Mediterranean Sea. On 5 August 2014, Oxfam warned that Israeli attacks damaging wells, pipelines and reservoirs

had caused further contamination of fresh water supplies, and that 15,000 tons of solid waste had leaked into the streets of Gaza (Institute for Middle East Understanding, 2014). Security concerns forced humanitarian organisations to suspend chlorination of the water supplies in Gaza despite estimations that 90 per cent of the water in Gaza was unsafe to drink (Omer, 2015).

The fighting finally ended on 26 August 2014. The 50-day conflict claimed the lives of at least 1,483 civilian Palestinians, including 521 children, and 5 Israeli civilians (International Coalition for the Responsibility to Protect [ICRtoP], 2015). The Coastal Municipalities Water Utility (CMWU) claimed that before and during the offensive the ICRC had passed on the coordinates for all the water and wastewater facilities to Israeli authorities to prevent destruction of these installations. However, it seemed that these facilities were deliberately targeted without any restrictions. The shelling of groundwater wells and bombing of water carriers contributed to water supply shortages.

The UN Office for the Coordination of Humanitarian Affairs (UN OCHA) claimed that the state of destruction, devastation and displacement caused by the conflict reached unprecedented levels since the start of the Israeli occupation in 1967 (ICRtoP, 2015). A factsheet published by the World Bank in August 2014, underlined the significant shortage of water and the severe public health threat to the population of Gaza. It estimated that more than 80 per cent of the water wells in Gaza were not functional. Furthermore, only 50 per cent of the wastewater was treated and an estimated 100,000 million cubic metres of raw sewage was discharged directly into the sea every day. It also described threats to the structural integrity of a sewage lake due to limited availability of electricity, at great risk to the health of the population and to the environment (Worldbank,

2014). On 23 June 2015, the UN Human Rights Council presented the report of an independent international commission of inquiry into International Humanitarian Law (IHL) and International Human Rights Law violations in the Occupied Palestinian Territory during military operations from 13 June 2014 onwards (UN Human Rights Council [UNHRC], 2015). The report confirmed that water and sanitation facilities in Gaza were heavily affected by the escalation of violence.

The 2014 attacks exacerbated an already critical sewage situation caused by years of conflict and import blockades, and caused a humanitarian and environmental crisis in most of the Gaza Strip (Coastal Municipalities Water Utility [CMWU], 2014).¹ The municipality of Gaza and human rights groups such as Amnesty International and Human Rights Watch saw these attacks on the water and sewage systems as a form of 'collective punishment' on the Palestinian people (Omer, 2014). The CMWU's assessment showed preliminary direct and indirect destruction to be around USD 33.4 million, including damages to groundwater wells, desalination plants, water reservoirs, water networks, wastewater treatment plants, wastewater collection networks and pumping stations, environmental fallout, and administrative costs (CMWU, 2014). The conflict left wide areas of Gaza devastated. The Palestinian Authority (PA) said in a study that reconstruction work would cost USD 7.8 billion, 2.5 times Gaza's gross domestic product (Bushra, 2014).

The UN OCHA assessment confirmed that an estimated 370,000 persons were directly affected by the damage caused to water and sewage facilities. A total of four systems were completely destroyed; another fourteen were damaged. The strike on the Gaza power plant by the IDF meant that water supply to the entire population of the Gaza Strip was cut off or severely restricted for several weeks during the conflict (UN OCHA,

2014). Prior to the 50-day conflict, the average water consumption per person per day in Gaza was 70 litres, compared to the World Health Organisation's minimum standard of 100 litres per person per day, evidence of the stress the infrastructure faced and the lack of adequate facilities for residents of Gaza.

As of July 2014, an estimated one-third of Gazans only received running water for six to eight hours every four days. Moreover, the price of fuel had increased four-fold and, as a result, the municipality could not afford to run the wastewater pumping stations, or household water wells. With four out of seven sewage pumps having completely stopped functioning, untreated raw sewage emptied directly into Mediterranean waters. While in 2014, an estimated 65,000 cubic metres of raw sewage was discharged into the Mediterranean on a daily basis (Gilbert, 2014), by 2019, this was up to 108,000 cubic metres daily (McAuley & Balousha, 2019). This occurred in close proximity to residential areas, playgrounds and the beach, severely polluting the environment, impeding local life and markets, and posing a major threat to public health (Gilbert, 2014).

4.2 Victims: **Disease and death by sewage**

Gaza's water issue is twofold: There is both a shortage of potable water and a lack of wastewater treatment. In late August 2014, UN OCHA reported that about half a million people were directly affected by damage to water facilities, and one million by damage to wastewater facilities. Rapidly deteriorating infrastructure, strict limitations on the import of construction materials and water pumps, and a diminished, declining, and unreliable energy supply have in recent years expedited the water crisis and exacerbated water-related health risks

(Efron et al., 2018). Furthermore, Israel siphons off over 80 per cent of Gaza's groundwater through wells tapping Gaza aquifer sources: A key reason why the aquifer is not replenishing and is becoming increasingly contaminated (Gaza Unlocked, n.d.).

In December 2014, water supply remained irregular for twenty per cent of people with interruptions at times lasting for five days. As a result, many families had to rely on water tankers for their water supply. Overall, water-related costs increased, affecting access to drinking water of already vulnerable families (Efron et al., 2018). According to estimates, about 1.2 million people lacked access to water and sanitation services at the end of the 50-day conflict.

Six years on, the residents of Gaza still grapple with the effects of the damage to the water infrastructure. Twenty years ago, 85 per cent of Gaza's drinking wells were too contaminated for human consumption; today, this figure stands at 97 per cent. Local tap water is too salty to drink because the aquifer below Gaza has been over-pumped so severely that seawater is flowing in. According to a 2010 survey, around 83 per cent of Gazan households relied on private vendors' trucks for water, which is 15-20 times more expensive than water from the network. This particularly impacts the most vulnerable and poor (United Nations Country Team [UNCT], 2017). According to UN standards for affordable water, the cost should not exceed three per cent of household income. However, according to the same survey, some residents of Gaza spent as much as one third of their income on water (Efron et al., 2018). Trucked water is also unregulated and unreliable in terms of quality, and is prone to faecal contamination (Tolan, 2018a).

Poor water quality and access contribute to an estimated 26 per cent of all reported disease in Gaza and are the leading cause of childhood

mortality. Waterborne diseases are the primary cause of illness in children, particularly diarrheal diseases, gastroenteritis, kidney disease, paediatric cancer, typhoid, salmonella, and 'blue baby syndrome', an ailment causing bluish lips, face, and skin, and blood the colour of chocolate (Efron et al., 2018; Tolan, 2018b; Tolan, 2018c). A study in 2017 revealed an alarming prevalence of stunting in Gaza, which is linked to the incidence of childhood malnutrition. The study also found a positive correlation between stunted mothers and stunted children, pointing towards the possibility of these developmental problems transcending generations (El Kishawi et al., 2017). In a detailed report by Al Jazeera in 2018, a doctor in the children's ward at Al-Nassar hospital in Gaza shared that the number of infants coming into the facility suffering from diarrhoea, vomiting and dehydration has skyrocketed. This is reason for alarm as diarrhoea is the second largest killer of children under five globally. A Rand Corporation study further corroborated that bad water is a leading cause of child mortality in Gaza. Some 60 per cent of kindergarten age children in Gaza were found to suffer from at least one parasitic infection, which experts believe is caused by water contamination in the Strip (Efron et al., 2018).

In 2016, five-year-old Mohammad Al-Sayis swallowed sewage-laced seawater, ingesting faecal bacteria that led to a fatal brain disease. Mohammad's was the first known death by sewage in Gaza (Tolan, 2018b). A lack of power to run Gaza's sewage facilities means that vast amounts of sewage are being discharged into the Mediterranean. Beaches are contaminated. The smell of effluent lingers in the air. 'I feel like I live in a septic tank', one resident said (Cooke, 2018). Children are warned not to play on the beaches or swim in the sea. The Ministry of Health shut down Zikim Beach in July 2017 due to faecal contamination (Udasin & Lazaroff, 2017). Residents are concerned about the

contamination of fish caught within the Israeli imposed six-mile fishing limit off Gaza's coast (Cooke, 2018).

A 2017 UN report predicted that by 2020, Gaza's coastal aquifer will be irreversibly damaged (UNCT, 2017), however, the organisation knew even then that no one should be living in Gaza's already dangerous conditions. 'From our perspective, [the report] was a useful sort of ringing the alarm bell a couple of years ago,' said Matthias Schmale, the director of operations in Gaza for the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA). 'But for us it's no longer really the issue that by 2020 it will be unliveable [...] The key question is how do we prevent total collapse?' (Balousha & Berger, 2020). The UN had already been flagging a de-development in slow motion, observing development indicators ranging from energy to water to employment to poverty to food security (Baker, 2017). Scientific analysis conducted by Seyam et al. (2020) shows that if the current water pumping rate is maintained in Gaza, the availability of fresh water will decrease in disquieting rates by the year 2030, and only about eight per cent of water from the aquifer will conform to the drinking standards.

The effects on civilians as a result of toxic waste being pumped into the Sea is not only limited to the Gaza Strip. While the sheer amount of sewage being pumped into the Mediterranean means it is unsafe for residents of Gaza to even take a swim in the Sea, this also has consequences for the wider region – including for Israel, where the nearby coastal city of Ashkelon has experienced the effects of Gaza's sanitation breakdown (McAuley & Balousha, 2019). The Ashkelon desalination plant supplies water to fifteen to twenty per cent of Israel's population. Furthermore, there is the impending risk of bacterial and viral pathogens like polio traveling through sewage and waterways outside of the

Gaza Strip, most notably to Israel and Egypt, a potential for significant public health risks for the populations there as well. Indeed, polio has already been found in Israeli sewage systems, attributed to the sewage runoff from the Gaza Strip into Israeli waterways (Efron et al., 2018).

The effects of fighting on the lives of the people in Gaza – where three out of four are refugees – are not only on the water, sanitation and electricity infrastructure. Much of the agricultural land has been destroyed by frequent invasion of heavily armoured vehicles or is off-limits to Palestinians because the Israelis enforce a buffer zone inside the Gaza Strip. The fishing industry has been central to Gaza for hundreds of years, but fishermen are not permitted to go beyond three nautical miles because of a naval blockade (Simmons, 2018). Fewer people are granted permission to leave the Strip than they were in 2014, even for medical reasons. The border crossing with Egypt also remains closed. Only a third of the 11,000 homes destroyed in 2014 have been rebuilt. The economic knock-on effects of two wars and ten years of Israeli sea and land blockades have led the Gazan economy to effectively collapse: Unemployment is sky-high at 41 per cent, rising to 60 per cent for the young (The Independent, 2017).

4.3 Perpetrators: Who is to blame?

Assigning blame for the plight of Gazans is not simple. Even though the water and sanitation crisis is not a new phenomenon in Gaza – which could be described as being in a chronic state of water emergency – a confluence of negative developments has worsened the situation and its associated health risks. For instance, the continued depletion of the coastal aquifer, Gaza's only source of freshwater, is not sufficient to meet the needs of the two million Palestinians

living there. Decades of overpumping, combined with intrusion of wastewater, agrochemicals, and saline water, have brought the aquifer to a state of possibly irreparable damage. Only three per cent of Gaza's drinking water wells are actually drinkable: Is that because Gaza's citrus industry pumped too much? Or because Israeli agricultural settlers depleted a deep pocket of fresh water before they left Gaza in 2005? Or the simple fact that Gaza's population quadrupled in a matter of weeks when towns and villages fell to Israel in 1948, resulting in mass displacement? Food and water-borne diseases have also been a concern – the power is shut off for twenty hours a day. Are Israel and Egypt to blame for withholding fuel deliveries? Or Israel, for bombing water and sewage infrastructure in Gaza during the 2014 war? Or the fight between Hamas and the PA, which deprives Gazans of critical medicines?

Israel: Recurring conflict with Israel has severely damaged the water, sanitation and hygiene (WASH) infrastructure in Gaza. In addition, severe limits on access and movement imposed by Israel and Egypt have hindered post-conflict repair and reconstruction. Israel has strong restrictions on items that could be used for both civilian and military purposes. This list includes 23 essential items needed for the WASH sector, such as pumps, drilling equipment, and chemicals for water purification (Efron et al., 2018). Less than sixteen per cent of items needed to construct vital water infrastructure are reaching Gaza (Oxfam, n.d.). This blockade makes it incredibly difficult to develop WASH infrastructure to meet the needs of a growing population (Efron et al., 2018). The economic blockade – fully implemented since 2007 – contributes to worsening poverty, skyrocketing unemployment and child malnutrition, according to several human rights groups, and has been described by the Secretary-General of the Human Rights Commission as 'a continuing collective penalty against the population of Gaza' (Efron et al., 2018).

The IDF carried out more than 6,000 airstrikes in Gaza during its 2014 operations. Photos taken after the attacks show large craters where residential buildings stood before. The sheer number of shells fired, as well as the reported dropping of over 100 one-ton bombs in a short period of time in a densely populated area, together with the reported use of an artillery barrage, raise questions as to the respect by the IDF of the IHL rules of distinction, precautions and proportionality. The methods and means employed by the IDF could not, in such a small and densely populated area, be directed at a specific military target, and could not adequately distinguish between civilians and civilian objects and military objectives. The commission also found that the power plant in Gaza was hit four times by the IDF, and only the fourth time, when the plant's fuel tank exploded did Israel comment that the IDF had missed its target (Efron et al., 2018). This signals that Israel will use its overwhelming technology and firepower to destroy far more than strictly military targets (Black, 2014). In a damning indictment of the conduct of hostilities by Israeli forces, the commission blamed senior Israeli political and military figures. The report declared that Israel did not revise its practice of air strikes even after their dire effects on civilians became apparent, and raised questions whether this was part of a broader policy which was at least tacitly approved at the highest level of government (Murphy, 2015).

Israel also has effective control over all of the water from the Jordan River to the Mediterranean, and hence controls how much goes into Gaza. 'We have 15% of our water resources, and the rest is stolen by the Israelis,' says Mazen Al Banna, the deputy minister for the Hamas government's water authority. Israel directs the flow of the Jordan River, and uses its control over the Mountain Aquifer to prohibit Palestinians from drilling wells – even though the aquifer lies almost entirely beneath the

West Bank (Tolan, 2018c). While Palestinian water is piped into Israel at no cost, a fraction of it is then piped back again for a fee. In this way, Israel is extracting from Palestinians both their water and their money. In some cases, Palestinians are forced to pay ten times more for their water than the price in Tel Aviv. Israeli settlers enjoy an estimated 400 litres per person per day, while some Palestinians in Gaza survive on as little as 10 litres per person per day, far below the bare minimum global Sphere standards for emergencies (Rabi, 2014). Furthermore, the inequality of water access has always been a source of tension especially when Palestinian villagers see water pipes leading to Israeli colonies passing through their land without supplying their village with water. In an assessment of 60 springs on Palestinian land close to Israeli settlements, UN OCHA found that

in 22 of the water sources, Palestinians have been deterred from accessing the springs by acts of intimidation, threats and violence perpetrated by Israeli settlers, while in the eight springs under full settler control, Palestinian access has been prevented by physical obstacles, including the fencing of the spring area, and its 'de facto annexation' to the settlement. (Rabi, 2014)

Palestinian Armed Groups: While assigning blame, one must also consider the events that led to the escalation of violence by Israel into the Gaza Strip in June 2014. On 12 June 2014, three Israeli teenagers were kidnapped and brutally murdered in the West Bank (UNHRC, 2015). Moreover, the discovery of tunnels from the Strip leading into Israel added to a sense of insecurity. Palestinian armed groups increasingly launched rockets into Israel during June and July 2014. According to the Israeli government, approximately 4,000 of the 4,500 rockets and mortars fired by Palestinian armed groups were directed at Israeli cities, towns and residential

communities; 250 landed accidentally in Gaza; and the rest were directed at IDF troops in Gaza (Israeli Ministry of Foreign Affairs, 2014). However, the independent commission found that most of the rockets were aimed at military facilities, and in instances where civilians were targeted, in a few cases Palestinian armed groups appear to have provided advance warning before launching attacks that may have killed Israeli civilians (UNHRC, 2015). The operations and impact of these armed groups are usually disproportionate compared to the IDF.

Rivalry between Hamas and the Palestinian

Authority: Another factor adding to the misery of Gazans is the rivalry between the Fatah-led PA and Hamas, the de facto government in Gaza (Efron et al., 2018). Fatah lost power in 2006 when Hamas won the Palestinian Legislative Council elections. Tensions between the two rivals caused numerous violent clashes in the Gaza Strip. The two sides' mutual hostility has defined the stark geographical and ideological division in Palestinian society between the West Bank and Gaza, which they have ruled separately since the 2007 clashes (Beaumont, 2017). In June 2017, the PA stopped paying Israel to supply Gaza with electricity, causing drastic restrictions on power (Haaretz, 2018). While generators are available, only a few people can afford the fuel to run them (Simmons, 2018). Under a deal struck between the PA and Hamas later that same year, the PA lifted the crippling electricity restriction on Gaza. However, further progress towards full implementation of the deal stalled in 2018 (Freedom House, 2019).

Funding cuts: The assistance that the UNRWA provides was also jeopardised. In January 2018, the US Trump administration announced that it was withholding USD 65 million out of the 125 million of planned funding to the agency – a move that humanitarian officials said would exacerbate the crisis. The US eventually

withdrew USD 350 million of funding by the end of 2018, amounting to over a quarter of the agency's USD 1.2 billion annual budget (Cheslow, 2018; Beaumont & Holmes, 2018). While other countries contributed or pledged as a result of this cut, the agency still faced a shortfall of USD 64 million, which threatened education for 525,000 students, essential primary care for 3 million patients and food assistance for 1.7 million refugees (UN General Assembly, 2018). UNRWA not only serves Palestinians in the occupied territories but also in Jordan, Syria and Lebanon.

4.4 Significance: **WASH infrastructure as an asset** **of war**

This case falls within the discourse on Toxic Remnants of War (TRW), which are defined as 'any toxic or radiological substance resulting from conflict or military activities that forms a hazard to humans and ecosystems' (Kellay, 2014, p. 13). Direct sources of TRW are the immediate result of military activity, such as the decision to target a petrochemical site, by which pollutants are released into the environment, or munitions residues that spread out over urban or rural areas during heavy fighting. Indirect sources of TRW result from sequences of events or conditions connected to conflicts and instability. Large-scale armed conflicts often weaken state authority, reducing the regulation and governance of such activities as waste collection and water treatment. Weakened governance also creates the conditions in which industrial sites and stockpiles may be damaged, abandoned or looted, which may expose individuals to toxic substances (Zwijnenburg & Te Pas, 2015).

One source of TRW is the destruction and damage of water and sanitation infrastructure, as

described here. Airstrikes on water and sanitation have become a common feature of modern warfare. WASH systems are often targeted as a means of attacking civilians, in breach of the Geneva Convention, said Sian White of the London School of Hygiene and Tropical Medicine: 'Hospitals and water and sanitation infrastructure used to be "off limits", with warring parties respecting their value to human life, but recent experience indicates that this is no longer the case', said White. 'Perpetrators of conflict are increasingly viewing water and sanitation systems as an asset of war that can be harnessed to gain power and destroyed to inflict harm on civilians' (Hodal, 2019). In modern conflict, warring parties have also diverted or cut off sources of water and electricity to civilians in opposing territories.²

A study by UNICEF which analysed mortality data from sixteen countries beset by long-term conflict, revealed that unsafe water, sanitation and hygiene kills nearly three times more children under the age of fifteen years than direct conflict (Hodal, 2019). The effects of damaged WASH networks may be felt until years later. For instance, even though Lebanon's 33-day war with Israel finished over a decade ago, damage to over 300 water and 150 sewage networks exacerbated a water crisis that continues today in the country: One in three Lebanese now buys alternative sources of drinking water (Dathan, 2018). Waste management also becomes an issue during conflict when services are broken down. Poor sanitation coupled with lack of immunisation, for example, led to new polio cases being detected in places in Syria 2017 and 2018, that were polio-free prior to the crisis (World Health Organisation & UNICEF, 2018).

The environmental footprints of modern conflicts are creating acute and chronic threats to civilian populations. It is yet another reminder that civilian protection cannot, and should not, be viewed as distinct

from protecting the environment upon which people depend. It underscores the urgency behind the need for new and creative policy approaches, which can help minimise environmental contamination, ensure recognition and assistance for those harmed, and which encourage timely and effective remediation (Weir, 2015).

Images



An engineer from the Coastal Municipalities Water Utility inspects a damaged sewage pumping station in Beit Hanoun, a high density urban area close to Gaza City.

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Bibliography

- Baker, L. (2017, July 11). Gaza 'unliveable' ten years after Hamas seized power: U.N. *Reuters*.
- Balousha, H., & Berger, M. (2020, January 2) The U.N. Once Predicted Gaza Would be 'Uninhabitable' by 2020. Two Million People Still Live There. *The Washington Post*.
- Beaumont, P. (2017, October 12). Hamas and Fatah sign deal over control of Gaza Strip. *The Guardian*.
- Beaumont, P., & Holmes, O. (2018, August 31). US confirms end to funding for UN Palestinian refugees. *The Guardian*.
- Black, I. (2014, July 29). Israel is finding it hard to deny targeting Gaza infrastructure. *The Guardian*.
- Bushra, S. (2014, September 25). Fatah-Hamas agreement gives unity government control over Gaza. *Reuters*.
- Cheslow, D. (2018, December 13). US cuts funds to Palestinian refugees, leaving many without essential services. *The World*.
- Coastal Municipalities Water Utility (2014). *Damage Assessment Report: Water and Wastewater Infrastructure (Gaza Strip; 7 July - 14 August 2014)* [Report]. Coastal Municipalities Water Utility.
- Cooke, K. (2018, August 13). 'I feel like I live in a septic tank': Gaza's environmental meltdown. *Middle East Eye*.
- Dathan, J. (2018). *When the bombs fall silent: The reverberating effects of explosive weapons* [Report]. Action on Armed Violence.
- Efron, S., Fischback, J. R., & Giordano, G. (2018). Gaza's Water and Sanitation Crisis: The Implications for Public Health. *Institute for Security Studies*, 85-101.
- El Kishawi, R. R., Soo, K. L., Abed, Y. A., & Wan Muda, W. A. M. (2017). Prevalence and associated factors influencing stunting in children aged 2-5 years in the Gaza Strip-Palestine: a cross sectional study. *BMC Pediatrics*, 17(210), 1-7.
- Freedom House (2019). *Gaza Strip* [Webpage]. Freedom House. Accessed: June 2019.
- Gaza Unlocked (n.d.). *Water and Sanitation* [Webpage]. Gaza Unlocked. Accessed: August 2020.
- Gilbert, M. (2014). *Brief report to the UNRWA: The Gaza Health Sector as of June 2014* [Report]. University Hospital of North Norway.
- Haaretz (2018, March 13). The Bloody Hamas-Fatah Power Struggle That Threatens to Return Following Gaza Assassination Attempt. *Haaretz*.
- Hodal, K. (2019, March 22). Dirty water 20 times deadlier to children in conflict zones than bullets Unicef. *The Guardian*.
- Institute for Middle East Understanding (2014, September 10). 50 Days of Death and Destruction: Israel's "Operation Protective Edge"[Blog post]. *Institute for Middle East Understanding*.
- International Coalition for the Responsibility to Protect (2015). *Crisis in Gaza* [Report]. International Coalition for the Responsibility to Protect.
- International Committee of the Red Cross (2014, July 15). *Gaza: Water in the line of fire* [Press release]. International Committee of the Red Cross.
- Israeli Ministry of Foreign Affairs (2014). *Violations of the Law of Armed Conflict, War Crimes, and Crimes Against Humanity Committed by Hamas and Other Terrorist Organisations during the 2014 Gaza Conflict*. Government of Israel, Ministry of Foreign Affairs.
- Kellay, A. (2014). *Pollution Politics: Power, Accountability and Toxic Remnants of War* [Report]. Toxic Remnants of War.
- McAuley, J., & Balousha, H. (2019) A Summer Day at the Beach? For Many Gazans, the Conflict has Put an End to That, Too. *The Washington Post*.
- Murphy, R. (2015, June 26). 'War crimes' investigation should follow UN inquiry into Gaza conflict. *The Irish Times*.
- Omer, M. (2014, July 16). Gaza: Israel bombs water and sewage systems [Blog post]. *The Ecologist*.
- Omer, M. (2015, February 12). Israeli jets destroying Gaza water and sewage systems: officials. *Middle East Eye*.
- Oxfam (n.d.). Failing Gaza: undrinkable water, no access to toilets and little hope on the horizon [Blogpost]. *Oxfam*. Accessed: June 2019.
- Rabi, A. (2014, March 22). Water apartheid in Palestine - a crime against humanity? [Blog post]. *The Ecologist*.
- Seyam, M., Alagha, J. S., Abunama, T., Mogheir, Y., Affam, C. A., Heydari, M., & Ramlawi, K. (2020). Investigation of the Influence of Excess Pumping on Groundwater Salinity in the Gaza Coastal Aquifer (Palestine) Using Three Predicted Future Scenarios. *Water*, 12(8), 1-18.
- Simmons, A. M. (2018, February 8). Life in the Gaza Strip: a cauldron of deficit, despair and desperation. *The Los Angeles Times*.
- The Independent (2017, August 25). Three years after its last war with Israel, Gaza is on the brink of a humanitarian crisis. *The Independent*.

- Tolan, S. (2018a, November 13). Gaza's water crisis is a 'ticking time bomb'. *The World*.
- Tolan, S. (2018b, October 29). Gaza's drinking water spurs blue baby syndrome, serious illnesses. *Al Jazeera*.
- Tolan, S. (2018c, October 30). How can Gaza's contaminated water catastrophe be resolved? *Al Jazeera*.
- Udasin, S., & Lazaroff, T. (2017, July 6). Gaza sewage forces shutdown of Israeli beach. *The Jerusalem Post*.
- UN Country Team (2017). *Gaza Ten Years Later: United Nations Country Team in the occupied Palestinian territory* [Report]. United Nations, Country Team.
- UN General Assembly (2018, November 9). *Palestine Refugee Agency Faces Greatest Financial Crisis in Its History Following 2018 Funding Cuts, Commissioner-General Tells Fourth Committee* (GA/SPD/684). United Nations, General Assembly.
- UN Human Rights Council (2015, June 24). *Report of the independent commission of inquiry established pursuant to Human Rights Council resolution S-21/1 (A/HRC/29/52)* [Report]. United Nations, Human Rights Council.
- UN Office for the Coordination of Humanitarian Affairs (2014, September 5). *Gaza Strip: WASH damage and estimated number of people with no access to clean water* [Fact sheet]. United Nations, OCHA.
- Weir, D. (2015). *Environmental Mechanics: Re-Imagining Post-Conflict Environmental Assistance* [Report]. Toxic Remnants of War.
- Worldbank (2014). *Gaza: Fact Sheet August 1, 2014* [Fact sheet]. Worldbank.
- World Health Organisation & UNICEF (2018). *Syria cVDPV2 outbreak Situation Report Nr. 41* [Report]. World Health Organisation & United Nations, UNICEF.
- Zwijnenburg, W., & Te Pas, K. (2015). *Amidst the debris: A desktop study on the environmental and public health impact of Syria's conflict* [Report]. PAX.

Endnotes

- 1 In 2013, the New York Times had reported that several sewage stations in the Gaza Strip were overflowing and 3.5 million cubic feet of raw sewage seeped into the Mediterranean every day.
- 2 This is also discussed in chapter 12 on the weaponization of water in Syria.