

WATER SUPPLY CONFLICTS IN GAZA

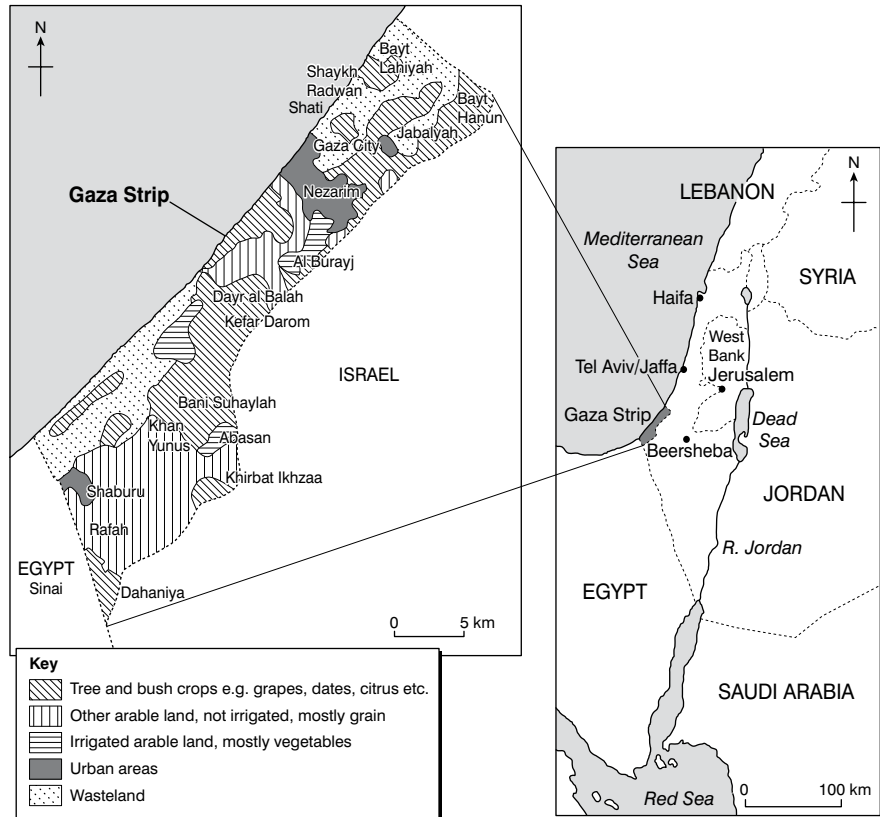
The nature of water supply conflict

Water is our most basic and precious resource. Here in the UK, where water is abundant, we very much take it for granted and find it difficult to visualise what real shortage means on a personal level. In some parts of the world, however, water supplies are much more limited and this is for a range of reasons:

- Low and unpredictable rainfall: the semi-desert countries of the Sahel region are in this category.
- Overuse of existing resources causing problems in continuing supply – too many people or too high a standard of living can be to blame here: people living in the rapidly growing urban areas of the Southwest USA are in this position.
- Competition for limited resources by neighbouring countries – this includes water resources being used as a weapon in a stressed political situation: water supply is being used as a lever in the political crisis between Israel and the Palestinians of the Gaza Strip.

Two factors will almost certainly aggravate the world's water supply issues in the future. Population growth is set to continue, each individual needing their share of a limited resource. Various predictions suggest there will be between nine and ten billion humans by 2150, the likely peak of population growth. Climate change is likely to create hotter, drier conditions in tropical zones, areas already experiencing limited water availability. Migration to more fortunate regions, perhaps Europe, would place pressure on supplies there too. As resources generally become more scarce, some people predict that wars might be fought for access to basics, including water. Already water supply is being used as a weapon in political conflicts, and climate change could exacerbate these already very difficult situations.

Figure 1: The Gaza Strip



Case study: water supply conflict in the Gaza Strip

Geographical background to Gaza

The Gaza Strip is a small zone, roughly 40 km by 10 km (actual area 360 sq km), on the eastern Mediterranean coast where Israel joins the Sinai Peninsula of Egypt (Figure 1). Non-agricultural land uses cover 55% of Gaza. The land is extremely densely populated, with 1.4 million people (3,889 people/sq km), and space is at a premium. The original population of the territory was 80,000. Living conditions are extremely cramped and there is little personal space or privacy. One-third of the population live in United Nations refugee camps. Three-quarters of the total Gazan population has refugee status.

Some 45% of the land is used for agriculture, 71% of which comprises permanent crops, mostly citrus and other tree produce. Arable land for seasonal crops makes up the rest. 115 sq km is under irrigation. A reliable water supply for this is essential, but there are some serious

problems with the quality of this water. Desertification is a current environmental issue.

Gaza has a warm temperate climate with mild winters and hot, dry summers. All Mediterranean climates rely on winter rainfall for year-round water supplies, but Gaza's climate pattern has a two-year cycle, with one wetter winter, followed by a drier one. Rainfall is not even across the territory. 117 million cubic metres of water ought to be available annually from the rainfall, but 61% of this is lost via evaporation before it can infiltrate into the ground. A further 2.5% is lost to surface run-off. The rest recharges the Gaza aquifer, the area's only natural water supply, which lies a few metres underground in the extremely permeable sandstone bedrock.

Water issues in Gaza

1. The occupation of Gaza

In 1967, when Israel occupied Gaza, the sustainable yield of the Gaza aquifer was already being fully utilised. Under Israeli

Figure 2: News extract from Aljazeera.net

Israel 'cutting Palestinian water'

Israel is denying Palestinians adequate access to clean, safe water while allowing almost unlimited supplies to Israeli settlers ... human rights group Amnesty International has said.

'Swimming pools, well-watered lawns and large irrigated farms in Israeli settlements ... stand in stark contrast next to Palestinian villages whose inhabitants struggle even to meet their domestic water needs,' the group said in a report released on Tuesday. (20/10/2009)

Israel's daily water consumption per capita is four times higher than the 70 litre per person consumed in the West Bank and the Gaza Strip, according to the report entitled:

Troubled waters – Palestinians denied fair access to water.

Source: Aljazeera.net

administration there were no plans for a realistic water management strategy.

There is **structural scarcity of water supply** in Gaza. Water supply is controlled and is not equally available to the different groups of people. Israelis living in Jewish settlements within Gaza have no restrictions placed on their water use. Moreover, their supply is subsidised, costing \$0.10/cubic metre, compared with \$1.20 which the Palestinians must pay, which, given the income differential between Israelis and Palestinians, means the poorer group are paying around 20 times as much, in real value. In addition, the Israeli agricultural land has the most reliable aquifers for irrigation water, whereas in the past, due to water shortages and strict quotas imposed on the Palestinians, and even destruction of water storage cisterns, they have had to sacrifice some of their citrus groves. The 24 Israeli settlements thrive within a faltering Palestinian economy, and the gap between their standards of living is increasing, which can only add to the existing political conflicts between communities.

Demand-induced water scarcity is caused by increased demand from a growing population. Both Palestinian and Israeli communities

have high birth rates. No census has been taken since 1967, so demographic statistics are unclear. However, even with a high infant mortality rate of around 30/1,000, natural increase is one of the highest in the world at somewhere between 5.2 and 6.0% per annum (UNDP). Water availability per capita therefore continues to decrease, and soon it is possible there simply will not be enough for drinking water, let alone for other purposes.

2. Aquifer problems

The Gaza Strip aquifer is currently being over-pumped, in order to try to meet demand, and it is uncertain for how long this situation has existed. Israel, which also has its water supply problems, has been tapping the aquifer from outside Gaza and taking some water which would naturally have replenished the sandstone underlying Gaza. The aquifer is most certainly not being used sustainably, so even more problems may be being created for the future. This is known as **supply-induced scarcity**, when there is a decrease in a renewable resource due to water depletion and/or degradation. Over-use causes the water table to fall, and the deficiency is naturally filled by water seeping in from nearby sources, in this case saline aquifers and from the sea itself. Seawater has been detected 1.5 km inland. The whole of the Gaza aquifer is therefore threatened with salinisation. In some places the irrigation water is already so saline it is damaging crop yields as well as the soil itself. Citrus trees, Gaza's main cash crop, are highly salt intolerant.

Figure 3: A view of downtown Gaza



Source: Wikimedia Commons

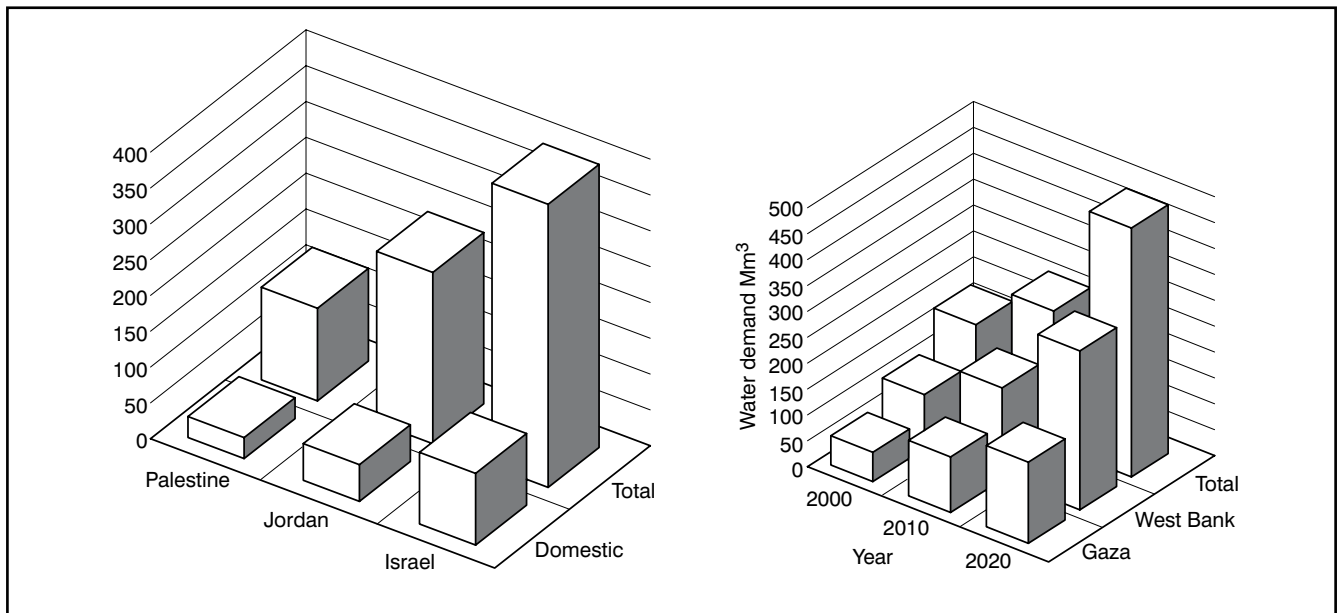
Not only is salt reducing the water quality in the Gaza aquifer, so is pollution. The main sources are agricultural chemicals and sewage. Pesticides, herbicides and nitrogenous fertilisers are used in considerable quantities in Gazan agriculture, given the limited supply of land available and the need for maximum yields to feed the growing population. Because the aquifer is so close to the surface, it is especially prone to this type of pollution.

With such high population densities and low-quality infrastructure, often damaged by military attacks, sewage is not always dealt with effectively. Many sewers and septic tanks leak directly into the ground and then into the aquifer. Landfill sites are not sanitary and the waste can drain into the water supply. Gaza is not able to treat all of its sewage; 80 million litres is disposed of daily by pumping it out to sea. Some returns to contaminate beaches, fish are killed and some sewage seeps back into the aquifer, affecting the water supply.

Damage to Gaza's water infrastructure

Over 30km of water infrastructure were damaged or destroyed by Israeli military action in December 2007–January 2008. Eleven wells were rendered inoperable and more than 6,000 roof storage tanks damaged. In 2007, repair works to both water supply and sewage systems had been underway to improve sanitation in general, when a new Israeli blockade was begun.

Figure 4: Water demand in the Near East region



Source: Inventory of Conflict and Environment / Trade and Environment database (www1.american.edu/ted/ice/gaza.htm)

The intention was to bring political pressure to bear on Hamas, the ruling party in Gaza, elements of which had been targeting Jewish settlements on the Israeli side of the border with missiles. Israel felt it was being attacked, and argued that its retaliatory action was fully justifiable. There are always at least two sides to every political argument and it is usually possible to understand, if not always to justify both.

The Palestinian water projects had to be put on hold due to the siege. Essential materials could no longer be accessed – Gaza is essentially cut off from the world, as Israel controls its borders (Figure 1). The main border is with Israel itself, and links to Egyptian Sinai are effectively cut. Tunnels exist but are inadequate to bring in larger pipes and equipment. The Israeli bombardment of Gaza was disproportionate in order to have a rapid impact, and therefore caused a large amount of damage to the already poor infrastructure on the Palestinian side. Reservoirs, wells, sewage networks and pumping stations were all severely damaged. Amnesty reported that in 2009 the water situation in Gaza had reached a crisis point, with 90–95% of the water supply in the territory contaminated and unfit for human consumption. The Israeli Water Authority claimed this report was ‘biased and incorrect, at the very least’, and that Israel had met its obligations under the Oslo peace agreement but said the Palestinian

authorities had failed to help themselves by recycling water, and by inefficient distribution of what they implied was an adequate supply (English Aljazeera News Network).

Impact of polluted water on the population of Gaza

People have contracted many different illnesses as a result of the poor water quality. Kidney disease has increased; too much salt damages the kidneys, and other toxins contained in Gaza’s water can cause disease and malfunction of this crucial organ. Demand for dialysis is increasing for patients whose kidneys are failing as a result of the salt and other pollutants taken into their systems, not only from drinking water but also from the fruits and vegetables they buy in the markets, grown with substandard irrigation water. The majority of people are poor and cannot afford to rely on bottled water, and in any case would still be eating the polluted foodstuffs. Hepatitis A and parasitic infections of the intestine have also increased. Both of these can be extremely debilitating. The number of people, especially children, suffering from diarrhoea has risen dramatically, according to Mahmood Daher, a doctor working with the World Health Organization (WHO), in the Gaza Strip. High nitrate levels in food and water are particularly likely to impact on infants and can do lasting damage to their systems.

The average per capita daily consumption of water for personal

and domestic use in Gaza is 91 litres. WHO recommend 100 litres as a minimum and 150 litres as desirable. In comparison, Israelis have access to 280 litres. Moreover, there are 10,000 Gazans who do not even have direct access to a water supply, and their health is particularly at risk. For thousands of others, water supplies do not operate all day and night. For the Gazan population as a whole, access to water supplies is limited on average to between six and eight hours in every 24, and for only one to four days a week. The youngest and the elderly are most at risk.

Problems with repairs to water infrastructure

Whilst the border stays closed and Gaza is blockaded and cannot get the necessary supplies, people’s health will continue to suffer. It is predicted that in five years’ time there could be no clean fresh water at all, and this really would bring dire consequences. There is an urgent need for cement, pipes, pumps, transformers and electrical spares to allow essential repairs to take place in both water supply and wastewater systems. 1,250 tonnes of cement are needed for the repair of water storage tanks alone, but the continuing blockade is preventing the necessary materials being brought in. Javier Cordoba, a water project coordinator with the Red Cross, said: ‘A lack of construction material and parts has led to a de-development of the water infrastructure, which could collapse at any minute. The whole

Figure 5: A chaotic scene at the waterfront



Source: http://www.myfavouriteplaces.org/wl/images/2007_gaza-harbour_march.jpg (copyright OCHA)

system is interconnected. Water wells use mechanical pumps to supply Gazan homes with water. The shortage of mechanical pumps and other spare parts has reduced the number of wells able to operate' (www.commondreams.org/headline/2009/09/17-7). Limited electricity supplies compound the problems. Without power the pumps cannot operate, so during power cuts, which are common, people resort to using generators. These use industrial fuel, usually oil, which is also in limited supply.

Ways forward in improving Gaza's water supply and sewage systems

The limitations on parts and materials have been discussed above. Nevertheless, through human ingenuity some progress is being made. Methods of getting around the blockade are sometimes possible, even though these only bring temporary relief to the situation:

- A new, rather primitive wastewater plant has been built in Rafah in the south of Gaza. Building materials came from the remains of the wall which used to divide Gaza from the Sinai Peninsula, and which had been blown up by the Palestinians. Whatever spare parts could be found elsewhere in Gaza were put to good use. The result is a temporary installation likely to last around five years.
- A more permanent and sophisticated wastewater plant is in construction in northern Gaza, but cannot be completed without parts imported from Israel. Hopefully in time it will start operation.
- New shallow wells have been dug which should supply water

without placing too much pressure on the aquifer. They do not supply as much water as deeper wells, but do improve supply to the towns and refugee camps temporarily, allowing other economic activity and everyday life to function once again.

- Desalination plants are needed to improve the quality of aquifer water. The international community has promised aid to construct these, and a few do exist. However, the cooperation of Israel is still required; other countries could put pressure on Israel to allow progress.
- UNEP (United Nations Environment Programme) has estimated that over \$1.5 billion is needed over a 20-year period to restore the aquifer. A UNEP report warns that 'Unless the degradation trend is reversed now, damage could take centuries to reverse.' International aid will be needed to provide these funds.

Conclusion

Amnesty International has stated that 'Israel must uphold its obligations as the occupying power by putting an immediate end to the current policies and practices which arbitrarily restrict the Palestinians' access to and availability of water in the occupied Palestinian territories [i.e. Gaza and the West Bank]' (FT.com, 27.10.2009). The Israeli government has strongly countered Amnesty's accusations. The Oslo agreement of 1994 laid down the amount of water that Israel was obliged to provide for the Palestinians. Israel claims to be exceeding that agreed minimum.

Clean water is, as stated at the beginning of this **Geofile**, the most basic of all resources. It seems wrong that politics controls its supply in some parts of the world. That situation is unlikely to improve. Water is so important it can be used to pressurise other people in a political situation, used as a lever for one group of people to achieve their aim. If global warming increases water shortages, the impact of political conflicts upon water supply can only increase.

FOCUS QUESTIONS

1. Figure 4 compares Palestinian daily water consumption with consumption levels in Israel and a neighbouring Arab country, Jordan. It also shows the likely growth of Palestinian water demand between 2000 and 2020.
 - (a) Describe the data shown on each graph.
 - (b) Explain what the graphs show about the water supply situation today and in the future.
2. Describe the reasons for the conflict over water resources in the Gaza Strip. (You may wish to research the Israeli-Palestinian conflict a little further for background first, in your textbooks or on the internet.) Consider the attitudes of those involved on different sides of the conflict.