



Hand on the Switch | January 2017

Who's responsible for Gaza's infrastructure crisis?

Written by: Maayan Niezna

Research: Aamer Ibraheem, Mohammed Azaiza, Aya Zinatey, Salah Mohsen

Legal research: Devin Kenny

Copy editing: Tal Gonen

Design and infographics: Noa Sivan

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Introduction

On Friday, May 6, 2016, a fire broke out in the al-Hindi home in a-Shati Refugee Camp in the Gaza Strip burning it to the ground. Three of the family's children, Yusra, Rahaf and Nasser, died in the blaze caused by candles that had been burning in the children's room.¹ Candles are often used for lighting in Gaza due to an ever-present and severe electricity shortage. The al-Hindi family's tragedy was a sad statistical addition to a slew of deaths that have taken place in Gaza under similar circumstances over the past several years. Even where the electricity shortage does not end in injuries or fatalities, it wreaks havoc to one degree or another on the lives of all of Gaza's nearly two million residents.

The dire state of Gaza's civilian infrastructure is often raised by Israel and within the international community as a source of concern. The discourse on Gaza's infrastructure problems and possible solutions for them tends to focus on the gap between the actual and the desired state of affairs, and the immense challenge involved in bridging it, whether technical or financial. There have been too few discussions about accountability for the current situation, let alone much clarity about the duties of those responsible for maintaining or improving Gaza's civilian infrastructure, and thus providing for the critical needs of its population.

Previous Gisha reports have summarized our analysis of the legal status of Gaza, and looked at the ways in which Israel continues to control the lives of Gaza residents or yield significant influence over them.² In this report, we review the impact various actors have had, actively or through omission, on the functioning of Gaza's civilian infrastructure – particularly energy, water, sewage and communications infrastructure. Though we take into consideration the role played by

each of the relevant actors – Israel, the Palestinian Authority, the de facto Hamas government in Gaza and the international community, given our position as an Israeli human rights organization, we seek to engage mainly our own government, that is, the Israeli government. By highlighting the elements of control Israel maintains over daily life in Gaza, and clarifying its tremendous influence, our goal is to assert that along with control comes responsibility to uphold human rights and ensure Gaza residents can lead normal lives.

Throughout the period that Israel exercised direct control over the Gaza Strip, with a military and civilian presence inside the territory (1967-2005), it refrained from investing the resources required for developing independent civilian infrastructure. In the years since the 2005 disengagement, when civilian and military presence were removed from inside the territory, Israel's severe restrictions on the entry of construction materials, spare parts, fuel, travel for experts and technicians to and from the Strip, together with direct damage caused to infrastructure during military operations and significant, deliberate harm to the local economy, have all hampered the ability of local authorities in Gaza to develop infrastructure that can meet the needs of the population. These needs far surpass what the existing infrastructure can supply and also exceed the funding available to the authorities to make critical changes and improvements. International organizations have stepped in to try and bridge the gap in capacity and funding, but despite significant efforts and achievements, limited resources and difficulties coordinating the activities of various agencies working on the ground have meant that the gap between the actual and the desired state of affairs continues to grow.



Photo: Eduardo Soteras Jalil

Selling fish by flashlight on the Gaza coast. Power outages last up to 12 hours and sometimes more.

Recognizing the significant degree of control Israel maintains over various aspects of civilian infrastructure in Gaza does not necessarily translate into a demand for it to enter Gaza and repair or build necessary infrastructure. Israel has a responsibility to protect the rights of Gaza residents in the spheres over which it maintains control and to allow Gaza residents to lead normal lives. Israel must ensure that its actions do not prevent other actors, be they Palestinian or international, from fulfilling their duties or compensating for others' duties. Therefore, the demand from Israel is, at the very least, to refrain from harming the economy and from blocking the efforts made by Gaza residents and international agencies to develop the economy, and in a more proactive way to promote the functioning of the economy and assist in maintenance and improvements to infrastructure.

The Palestinian Authority, the de facto Hamas government and the international community must ensure that their actions, in the spheres in which they have influence, advance the maintenance, repair and

development of Gaza's civilian infrastructure. The ability to address Gaza's many challenges depends on coordinated efforts by all relevant actors, including the feuding political factions with authority in the West Bank and in Gaza, whose ongoing split bears a heavy toll on the population.

The information presented in this report is based on research conducted by Gisha's research department, conversations and correspondence with Israeli, Palestinian and international officials and relies also on various reports and publications. Efforts were made to verify and cross-check all outside information on which this document relies. Given the scope and depth of the issues covered, and the limits of our technical expertise, our research focused on the main issues affecting civilian infrastructure in the spheres of energy, water and communications, and on the distribution of responsibility among the different actors. More in-depth analysis of the humanitarian aspects of the shortage, or the individual issues mentioned below can be found in the documents cited in the report. ♦



Energy Infrastructure

The situation on the ground

Electricity blackouts in Gaza last between 8-12 hours each day, and have sometimes even reached 20 hours straight. Cooking gas and fuel for industry and vehicles are sometimes unavailable as well. One constant in Gaza is the persistent noise made by generators – both domestic and industrial, large and small – that are employed throughout the Strip to power homes, businesses, schools and hospitals in the absence of consistent electricity supply. Generators are noisy, emit pollution and reek of gas. The shortage of electricity does not just interfere with daily lives, but also causes scores of accidents, some lethal. According to the human rights organization Al Mezan, between 2010 and mid-2016, 29 people died in accidents that occurred as a result of the electricity shortage.³ Families in Gaza are forced to spend a large part of their income on energy, whether the meager supply of electricity they receive through high voltage lines, or on the cost of fuel, generators and their repair.

Without a consistent supply of electricity, it is impossible to provide sufficient health, education and welfare services. Some medical equipment is prone to frequent malfunctions due to unstable electrical currents, while other equipment cannot be used at all as it cannot withstand the fluctuations in the current. It is difficult to keep medicine chilled. Untreated sewage gets discharged into the sea, and without the ability to use pumps, water supply is also affected. Household appliances like refrigerators or washing machines cannot be used, not to mention air conditioning in summer or heating in winter. With an intermittent supply of fuel, public transportation becomes unreliable and hospitals, schools and universities have difficulties operating. The industrial

and agricultural sectors, including food production, are also harmed due to energy deficiencies. Baking is not possible without ovens. Fresh food is hard to sell without refrigerators. Crops cannot be irrigated without water pumps, and fishing boats are difficult to sail without fuel. Commercial companies in Gaza reported a 30% surge in production costs due to disruptions in the supply of electricity.⁴

This is the daily routine. On a good day, Gaza's electrical grid supplies 208 megawatts (MW), of

The only power plant in Palestine

The Gaza Strip power plant was set up as part of an agreement signed between the Palestinian Authority and private investors, and began operating in 2002. Private investors hold 66% of the shares in the Palestinian Electric Company (PEC), the plant's operator, while its remaining shares are held by the public. The only power plant within the PA's jurisdiction, the facility was designed to serve the area in and around the city of Gaza, where roughly half of the Strip's residents live.

According to the agreement, the PA must provide the power plant with the fuel required for its operation, alongside a monthly payment of US\$ 2.5 million, in exchange for electricity generation, which was set to reach 140 megawatts. The power plant never reached this capacity, for various reasons: shortage of fuel, low carrying capacity of the relay network, and several bombardments by the Israeli Air Force, which hit the plant's turbines and fuel reserves. Despite its failure to produce 140 MW, the PA continues to reimburse the company for the full operating costs stated in the agreement. High production costs and the use of diesel, considered a relatively expensive fuel (which is even more expensive given a high excise tax), alongside the plant's low capacity, mean that the cost of the electricity generated by the plant is very high, when compared with electricity purchased directly from Israel or Egypt.

According to the PEC last annual report, the company's profits for 2015 stood at US\$ 13.5 million.

Source: <http://goo.gl/iJ9zf3>

which 120 (MW) are sold and supplied by Israel, 60 MW are produced by the local power plant (if enough fuel comes in from Israel, that is; the plant needs 350-360,000 liters of diesel daily to produce this amount), and 28 MW more are sold by Egypt. This supply falls far below demand, which is currently 350 to 450 MW. Any malfunctions, for instance in the lines running from Israel or Egypt, obviously reduce the supply.⁵ Supply also goes down when not enough diesel comes in.

Currently, the only fuel entering the Gaza Strip comes from Israel. The supply of diesel and gasoline for the private sector usually meets demand, but the supply of cooking gas that comes in daily is about half the daily consumption need. The daily need for cooking gas in Gaza is 300 to 350 tons, and can reach up to 400 tons daily during the winter. The gas pipeline at the Kerem Shalom Crossing has the capacity to bring in 280 tons per day only. In 2014, an average of 140 tons entered daily. The daily average for 2015 was 160 tons. During hostilities or periods of heightened tensions when the crossing doesn't operate consistently supply can drop.

This acute shortage in energy is not predestined, nor is it a result of a natural disaster. It is the product of neglect and destruction, economic hardship, political strife and severe restrictions on the entry of equipment and technicians into the Gaza Strip.

Causes of electricity and fuel shortages

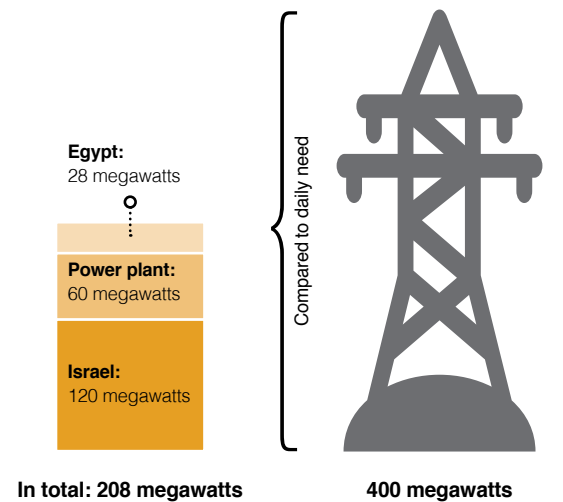
Gaza's energy shortage is the result of a combination of many different factors. From 1967 to 2002, Gaza was dependent on the electricity supplied by the Israel Electric Corporation (IEC). In the late 1990s and early 2000s, there were internal and organizational changes among the Palestinian authorities responsible for the energy market. One significant change was the building of the Gaza power plant, which began operating in 2002 and was slated to supply electricity mostly to Gaza City and its vicinity, where about half

of Gaza's 1.9 million residents live.


The power plant's production capacity, which was 140 megawatts when it was built, was never fully realized due to the limited carrying capacity of the relay network. The most the plant ever produced was about 90 megawatts, in 2006. That year, after Israeli soldier Gilad Shalit was taken captive, Israel bombed the power plant, destroying six of its transformers and its fuel reservoir. Even after repairs, the plant today is capable of producing 60 to 80 megawatts at most.⁶ The operation of the power plant was also hampered over the years by restrictions on the entry of diesel, which is needed for running it (about 350-360,000 liters of diesel are required daily for the plant to run at this capacity), and restrictions on the entry of equipment and parts. The relay network itself is extremely difficult to repair and maintain, due to a shortage of equipment, which Israel either bars from entry, or subjects to special permits that take a long time to obtain.

The most significant reasons for the shortage in fuel for the power plant are funding difficulties, a long and intricate history of disagreements between the split Palestinian Energy Authority in the Gaza Strip

Sources of electricity supply to the Gaza Strip



2002	2006	2006	2009	2013	2014
Power plant opened. Built for maximum production of 140 MW	Reached actual peak production of 90 MW	Power plant bombed following the capture of Israeli soldier Gilad Shalit. Even after repair, maximum production restored only to between 60-80 MW	European Union stops funding industrial diesel needed to run the power plant	Tunnel activity from Egypt reduced. Prior to this, diesel for the power plant was brought in through Gaza-Egypt tunnels	Power plant bombed for a second time during Operation Protective Edge



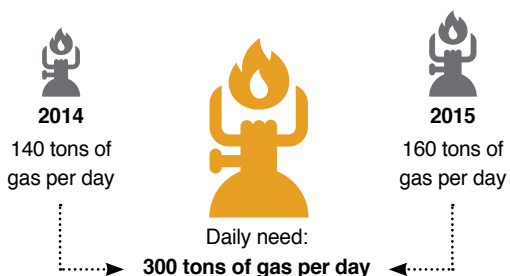
Gaza's sole power plant.

and the Energy Authority in Ramallah over the rate of excise taxes (the Palestinian Authority can control the rate of indirect taxation and make decisions on subsidies), and limited storage capacity (fuel tanks were damaged in an Israeli air strike in July 2014 and one reservoir has not been repaired due to difficulties bringing in the required equipment).

The excise tax is 116 percent of the original price of the fuel (in other words, consumers pay more than double the base price), and it is collected by Israel

and transferred to the Palestinian Authority. From 2006-2009, the European Union had covered funding needs for diesel for Gaza's power plant but in 2009, after more than three years, it reached a decision to stop its funding. The Gaza Energy Authority then began purchasing Egyptian fuel that was smuggled into the Gaza Strip through underground tunnels on the Gaza-Egypt border. Starting in 2013, Egyptian military forces' efforts reduced tunnel activity, resulting in shortage of fuel for the power plant. Over the next few years, Qatar donated millions of dollars to buy diesel for the plant. After Operation Protective Edge, the Palestinian Authority exempted fuel designated for the plant from the excise tax. Sources in Gaza say that this exemption, as well as the partial exemption promised for 2016, at a rate of 70 percent, have not been implemented, and the Gaza Energy Authority is paying 45 percent of the excise tax on fuel for the plant.

Average amount of cooking gas entering Gaza



Israel's responsibility for the shortage

Supply and control. Israel's influence on Gaza's electricity supply comes into play in several ways. First, Israel sells electricity to Gaza (120 megawatts, payment for which is transferred through the Palestinian Authority), as well as fuel. Israel is also responsible for maintenance of infrastructure located in its own territory, such as power lines, pipes and fuel pumps that enable the supply of electricity and fuel to the Gaza Strip. Gaza has been described by Israel's Supreme Court as "almost completely dependent" on the supply of electricity from Israel.⁷

Israel's control over the supply of fuel and electricity allows it to restrict, reduce or halt the supply, which it has done in the past. In 2007, Israel decided to reduce both the supply of electricity⁸ and the supply of fuel.⁹ Gisha together with other organizations petitioned the High Court against this decision, but the petition was dismissed after the security establishment pledged to allow fuel supply according to "a humanitarian minimum."¹⁰ This amount fell short of meeting essential needs in Gaza and was later significantly reduced, despite the commitment made before the court.¹¹

Israel's control of the crossings into and out of Gaza allows it to control and monitor the entry of fuel and equipment needed for the energy sector, including when funding for these items comes from an international organization or a third party country. Israel restricts certain types of civilian goods from entering Gaza, claiming they might be used for military purposes. These goods are defined as "dual-use" and include, among others, uninterrupted power supply (UPS) devices (which are essential given the reality of frequent blackouts),¹² cranes and other items required for repairing malfunctions. Dual-use items can be brought into Gaza by individual permit, with coordination between Israeli and Palestinian officials, and subject to certain procedural requirements, some of which are not disclosed to the public. Many

merchants and suppliers, as well as international organizations, have reported that they are unable to obtain individual permits to bring dual-use equipment into Gaza. In other words, the dual-use list sometimes functions as a black list, and equipment listed on it can be entirely barred from entering Gaza, even if it is needed for important civilian purposes.

Similarly, the production of renewable energy is also limited, as Israel restricts the entry of solar panels and batteries that allow the storage of the energy they produce into Gaza. Because of the high cost of solar panels and batteries, solar electricity in Gaza is extremely expensive, and rarely used, despite the fact that the main resource for it – sunlight – is abundant.

Israel's control over the crossings also means dependence on it for shipping equipment out for repairs, having experts come in to do repairs or provide training, and travel by engineers and others from Gaza to attend meetings and seminars.¹³

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"Dual-use" goods



UPS devices: Essential in situations with frequent power outages



Solar panels: Allow for cheap and accessible energy



Cranes: Critical for major construction projects



Batteries for solar panels



A dark street in Gaza City. Israel has bombed critical infrastructure.

Throughout decades of Israeli occupation, Gaza's economy has developed a tremendous dependency on Israel as a source of employment and as a consumer market. Aside from this dependency, Israel monitors Gaza's economy and dictates some aspects of it through its control over the taxation system, production inside Gaza (by controlling the entry of raw materials) and import and export (through rules that dictate what can be sold outside Gaza, how much and at what times). The restrictions Israel imposes on the sale of goods originating in Gaza in its own territory and in the West Bank, as well as on employment opportunities, seriously hamper economic development in the Strip. A strong economy might have been able to fund infrastructure and energy, in part because residents who are financially stable would be able to pay for electricity.

War damage: The decade that followed the implementation of the Disengagement Plan in 2005 was characterized by rounds of ground fighting in the Gaza Strip as well as air raids, both during large-scale

military operations and more "limited" operations. During these rounds of fighting, Israel bombed essential energy infrastructure facilities in the Gaza Strip. Repairs required a great deal of time and money, as well as approval from Israel to bring in needed equipment. Some of these facilities have not been repaired to date. Power lines have been destroyed at different times, and the difficulty involved in repairing them under fire has resulted in supply disruptions.¹⁴ We noted the airstrikes on the power plant in 2006 and in 2014. Since 2014, the fuel reservoir that was hit has not been repaired, mostly due to restrictions on bringing in necessary equipment, such as welding equipment, and the high cost of its reconstruction. The only remaining reservoir is small, and its contents can only sustain limited operations for three days. This means that if diesel fails to enter the Gaza Strip for more than three days, the power plant would have to shut down because of fuel shortages. The concern is not unfounded, as at times of increased tension, or fighting, fuel is not transported into the Gaza Strip.¹⁵

Control over construction and repairs by other actors. Construction of facilities by third parties, such as UN agencies, is subject to Israeli approval of every aspect of the project, including the facility itself, its location, the equipment needed for the construction and more.¹⁶

Significant influence over the Palestinian Authority. Even since Hamas took control of the Gaza Strip in 2007, the Palestinian Authority has continued to fulfill significant functions in Gaza's energy market, including coordination of the entry of fuel, and tax collection and payment for electricity and fuel. Israel's significant control over the Palestinian Authority on these issues stems from its control over the West Bank.

Palestinian Authority and Hamas control over infrastructure

The Palestinian actors involved in supplying energy in Gaza are: (1) **The Gaza Electricity Distribution Company (GEDCo)**, which is responsible for distributing electricity supplied by different sources, and for maintenance of and improvements to infrastructure. Its board is composed of mayors, who are mostly members of the Hamas movement; (2) **The Gaza Power Plant (GPP)**, which is a private company; (3) **The Palestine Energy Authority in Gaza**, which is responsible, among other things, for the production, import, storage, transport and distribution of energy, and for supplying the infrastructure required for electricity, including purchasing electricity;¹⁷ (4) **The Palestinian Fuel Authority in Ramallah**, which is responsible for supplying gasoline, petrol by-products and cooking gas. The authority also coordinates between Israeli fuel suppliers and companies that sell fuel to the Palestinian market.

The Palestinian Authority is responsible for funding the operation of the power plant and purchasing fuel, including diesel for the power plant. Because of

restrictions on the sale of fuel from Israel, as well as the high cost, the Hamas government has, at times, purchased Egyptian diesel, which was cheaper than its Israeli counterpart. Egyptian diesel was transported from the Sinai desert through tunnels. In mid-2013, following political changes in Egypt, tunnel activity was greatly reduced, leading to a drop in the supply of fuel from Egypt.

The fact that multiple actors are involved results in difficulties and disputes that disrupt the energy sector in the Gaza Strip. One major dispute is between the Gaza Energy Authority and the Energy Authority and Ministry of Finance in Ramallah over payment of tax for fuel purchased for the Gaza Strip.

Funding is another area of difficulty. Low collection rates on electricity bills (around 40 percent according to the electrical company),¹⁸ the inability to automatically collect payment from tens of thousands of people who aren't receiving paychecks, widespread exemptions from payment for electricity, electrical power piracy, deficient enforcement and high taxation on fuel all drain on resources.

The changing role of the international community

At certain times, international bodies, primarily countries, have supported the purchase of fuel for the Gaza Strip. The European Union paid for industrial diesel for the power plant between 2006 and 2009; Qatar donated fuel in 2012. As of late 2013, international actors, chief among them the government of Qatar, have donated tens of millions of dollars to subsidize and purchase diesel for the power plant in a bid to ensure that a limited number of essential health, water, sanitation and hygiene facilities continue to function and essential municipal facilities are able to purchase fuel to maintain operations.¹⁹

While third-party intervention carries benefits, it's not without complications. For instance, in

2013, concerns over security incidents in the Sinai desert prompted a change in Egyptian policies. The Egyptian authorities tightened travel restrictions through the Rafah Border Crossing and sealed and destroyed smuggling tunnels, leading to a fuel shortage that exacerbated the already fragile humanitarian situation, itself a product of Israel's long lasting access restrictions on Gaza. Power lines running from Egypt have often sustained damage in violent actions in the Sinai, which led to disruptions in the electricity supply from Egypt as well.

What it would take to meet Gaza's energy needs

The organizations and institutions associated with electricity production in Gaza suggest a number of solutions that will produce immediate, medium-term and long-term improvements to Gaza's electricity supply. The following are the main suggestions:

Short-term

A document issued by the Palestinian Energy and Natural Resources Authority (PENRA) suggests giving full tax exemption to fuel transferred to the power plant.²⁰ The exemption would allow more resources to go towards purchase of fuel, which would increase the power plant's production and enable Gaza residents to have more hours of electrical service per day.

PENRA also suggests funneling some donor funding and reconstruction grants towards the electricity sector, including for the purpose of purchasing tax-exempt fuel, repairing infrastructure and making necessary modifications in the distribution system required for coping with higher demand. All these are suggested in addition to improved collection and reduction in exemptions given to institutions and organizations, which would increase revenue. PENRA also recommends signing an agreement with Israel to ensure access and safe travel by technicians to locations where they are needed.

Medium-term

PENRA suggests allocating more of the Gaza reconstruction budget to repairing and expanding the electricity grid and the distribution network, together with increasing supply from Egypt and Israel. The authority also recommends completing the "Line 161" project, which is intended to supply 100 megawatts of power from Israel. The infrastructure needed to run the line is mostly already in place. According to PENRA, joint efforts by Israel and the Palestinians are required in order to reach agreements on increasing the electricity supply, methods of payment and the needs of the parties, coupled with improvements to infrastructure on the Palestinian side to enable it to receive the electricity and distribute it to consumers.

Another medium-term possibility is investment in solar energy, which would include lifting restrictions on the entry of necessary equipment to Gaza, tax exemptions for such equipment, and encouraging residents and institutions to use available solar energy. Projects of this type are implemented in other parts of the world with considerable success.

Long-term

The Palestinian Authority is interested in advancing Gaza's connection to an electric interconnection project, through Egypt, for a 600-megawatt supply (a power grid that would include Jordan, Syria, Libya, Egypt, Iraq, Turkey, Lebanon and Palestine).²¹ Given shifting sovereignties and borders in the region, it would be interesting to follow up and see how this vision progresses.

The Palestinian Authority is also interested in connecting Gaza's power plant to a natural gas source, either in Israel or in Egypt, which would reduce the cost of electricity production in the Strip and ensure the constant operation of the power plant. This would depend on the development of access to gas sources located in the Mediterranean off the Gaza coast. ♦

Water Infrastructure

The situation on the ground

The water that runs through Gaza's pipes is not potable. It is contaminated with high levels of chlorides and nitrates. The pipe system itself is old and dilapidated, and about a third of the water conducted through it is lost. Families make due by purchasing trucked or bottled water, but this is far from sustainable and can't be seen as a replacement for potable running water.

Both water supply infrastructure and Gaza's sanitation infrastructure are woefully inadequate to meet the needs of the Strip's nearly two million residents. This has a bearing on their lives, but certainly also on the lives of Gaza's neighbors. Most sewage gets discharged into the sea after partial treatment, or no treatment at all.

According to the World Health Organization (WHO), consumption of contaminated water and poor sanitation may lead to diseases such as cholera, diarrhea, dysentery, hepatitis A, typhoid and polio.²² Children and toddlers are most vulnerable to the immediate effects of microbiological infection. Along with pregnant women, children are also at higher risk of the long-term effects of chemically contaminated water (by nitrates, for instance).²³ According to the WHO, treatment of chemically contaminated water is considered a lower priority compared to microbiological pollutants, as the effects of chemical contamination are most often long-term. However, chemical pollutants in drinking water may cause serious health issues.²⁴

Nitrate contamination in Gaza's drinking water is severe. A study conducted in 2008 showed that 90 percent of the samples contained nitrate levels that were two to eight times higher than the maximum stipulated by the WHO. In babies under six months old, high nitrate levels in water may lead

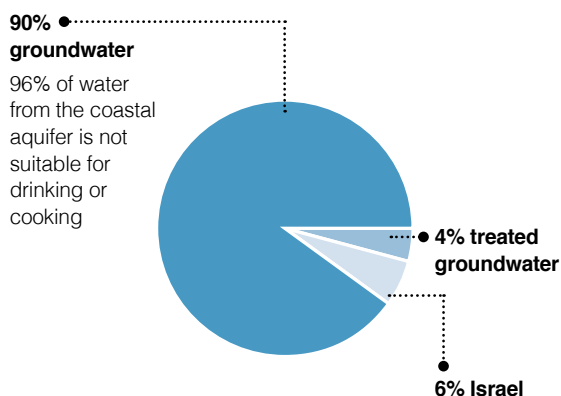
to methemoglobinemia, or blue baby syndrome (a disease that causes a decreased oxygen carrying capacity of hemoglobin). Half the babies tested in the study were already showing signs of the disease, as well as diarrhea and acidosis (a condition in which the blood's acid level is too high).²⁵

Throughout 2015, Gaza consumed 95 million cubic meters (mcm) of water for domestic use,²⁶ with consumption per capita averaging 86 liters a day.²⁷ According to the WHO, 100 liters per person per day is the minimum required to maintain health.²⁸

The three main water sources in Gaza are groundwater, originating in the aquifer and pumped

According to the World Health Organization (WHO), consumption of contaminated water and poor sanitation may lead to diseases such as cholera, diarrhea, dysentery, hepatitis A, typhoid and polio. Children and toddlers are most vulnerable to the immediate effects of microbiological infection

Water sources



Source: <http://goo.gl/3zMsPH>

through wells, which accounts for 90 percent of the supply;²⁹ an additional 4 mcm is desalinated seawater, and the third source is water purchased from Israel: 4-5 mcm in the past and 7.5 mcm in 2015.³⁰

Coastal aquifer. The coastal aquifer is a natural groundwater source which supplies water for domestic use, irrigation and industry. Groundwater is pumped from about 260 wells located throughout the Gaza Strip. The aquifer is partly replenished by precipitation, but pumping rates exceed renewal rates, and the groundwater deficit reaches scores of mcms every year.³¹ Intensive pumping and over-use of the aquifer leads to deteriorated water quality, as aquifer water is contaminated by sewage, industrial waste and seawater. Declining sea levels mean increased water infiltration over time,³² leading to a further deterioration in water quality. Fertilizers also infiltrate groundwater through irrigation of farmland. They constitute a major source of the nitrates that contaminate drinking water and put the people consuming it at risk.³³ Elevated salinity in many wells makes the water non-potable and unfit for domestic use or for irrigating certain crops.³⁴ Ninety-six percent of the water in the coastal aquifer is already unfit for use, and according to projections, by 2020, the damage to the aquifer will have become irreversible.³⁵

The water situation in Gaza

- 💧 Water pumped from the aquifer- 96% of the water is not fit for drinking
- 💧 1/3 of the water is lost due to the old and damaged water pipelines
- 💧 Sewage flows into the sea
- 💧 High quality water is mixed into the same network as low quality groundwater
- 💧 Shortage of electricity and fuel leads to difficulty in pumping, desalination and supply



Sewage in Wadi Gaza, with the power plant in the background. Wastewater contaminates drinking water.

Aquifer water must be purified in order to be used. There are dozens of private water purification plants in the Strip. While they do require licensing, monitoring is lax

Desalination: At the time of writing, only one desalination plant was operational. There are plans for building three more with international funding. The first plant is located in Khan Yunis and is in the final stages of construction. Funding has been secured for two more, (one in the Deir al-Balah area, the other near Gaza City), and construction is set to begin soon. Desalinated seawater now accounts for about **four percent** of domestic consumption.

Water purchased from Israel: Under the Interim Agreement, Israel is obligated to supply the Gaza Strip with at least 5 mcm of water per year.³⁶ The amount of water actually supplied by Israel over the years has been less.³⁷ In 2015, a third water pipeline between Gaza and Israel was added to the two existing ones, allowing a supply of up to 10 mcm annually. In the last year, the amount of water Israel sold to the Gaza Strip has gone up, but has yet to reach full capacity, due to issues affecting pipes and reservoirs in the Gaza Strip. The Palestinian Authority buys Israeli-supplied water from Israel's water company, Mekorot, at a cost of about 12 million Israeli shekels per year (the Palestinian Authority says it is required to pay 2.7 shekels per mcm in the old pipeline, and 3.5 for the

same amount of water in the new pipeline). Though this water is much better quality than the groundwater available in Gaza, it is streamed into the same network and mixed with the groundwater – which is not fit for human consumption – in order to somewhat improve the quality of the water supplied through the network. Residents cannot use the water that runs through the network for drinking or cooking, but it is used for other purposes.

Aquifer water must be purified in order to be used. There are dozens of private water purification plants in the Strip. While they do require licensing, monitoring is lax. Water may get contaminated during the purification process, either as a result of the process itself, the transfer of water from one machine to another, or from the taps.

Purified water is not supplied through the network. It is sold directly to homes in delivery tanker trucks, according to changing schedules. Most Gaza households get their drinking water in this way. Some households buy bottled water or have domestic filtration systems. Demand for water in Gaza exceeds supply already, and is set to grow.³⁸ The need is much higher than the amount of water that can be supplied through pumping and desalination.³⁹

Standards

Water is essential for life, health and normal human functioning. There are standards and guidelines on the quality and amount of water supplied.⁴⁰ Gaza's water situation does not even come close to these standards. In some of the pumping wells, chloride and nitrate levels are up to 10 times the maximum stipulated by the WHO.⁴¹

The amount of water available to Gaza residents is not enough for domestic, industrial and agricultural use. The Palestinian Water Authority estimates that Gaza needs about 200 mcm of water per year for domestic, agricultural and industrial use. That is

roughly the amount pumped today, but due to network inefficiency, which results in a high rate of water loss, and because pumping from the aquifer cannot continue at this rate for long, the shortage is only expected to increase.

Gaza's water network fails to meet the standard of supply to homes, schools, work places or their vicinity. The network does not reach some areas in Gaza at all. Other areas do not receive regular supply. About 70 percent of Gaza's population receives water through the network only once every three to four days, for a few hours each time. In areas that are better off, water runs through the pipes for a few hours each day. When water is available, residents conserve it in receptacles near their homes for future use. Due to the erratic supply of electricity, it is difficult to pump water to higher floors. Drinking water is not supplied through the network at all, and the supply of drinking water in tanker trucks is irregular and intermittent.

Financial access to water. Despite the poor quality and unstable supply, water is very expensive in the Gaza Strip. According to UN standards for attainable water, the cost of water should not exceed five percent of a household's income. Yet, according to a 2010 survey,⁴² some families in the Gaza Strip spend a third of their income on water. A survey held in 2007-2008 revealed that, on average, Gaza households spent 11.7 percent of their income on water.⁴³ In the 2010 survey, 83 percent of households reported that their main source of water was water purchased from private vendors.⁴⁴ Others rely on unregulated wells for domestic use. Many do not pay for water due to lack of funds, or deficient collection.

Sewage. About 28 percent of the population live in areas that lack sewage infrastructure,⁴⁵ and therefore use septic tanks or cesspits. The Gaza Strip has five sewage treatment plants, which are only partially operational, partly due to limited electricity supply, which makes it impossible to complete the treatment

cycle. Most of Gaza's sewage, tens of thousands of liters per day, gets discharged to the sea, completely untreated. This causes pollution, puts public health and the quality of groundwater in serious danger, and harms the fishing industry.⁴⁶

The factors that led to the current situation.

Difficulties in repairing, restoring, and maintaining the water network lead to inefficiency and over-pumping. Friction and conflict between the actors involved and fragmented responsibilities between them cause difficulties in funding, project implementation and infrastructure improvements.

Gaza's sewage system suffers from years of neglect, the result of political instability, damage caused during various military operations and a shortage of spare parts and construction materials that are required to rehabilitate and improve the system.⁴⁷

The shortage of electricity and fuel, covered in the previous chapter, makes it difficult to pump and desalinate water and impedes its regular, efficient supply. It also creates risks due to non-treatment of sewage, and sewage overflow into the streets.⁴⁸ Concerns over the continued energy crisis in the Gaza Strip also lead to difficulties in securing funding for water projects. For instance, there has been no

progress on funding for a large desalination plant in the Gaza Strip due to concerns it would be impossible to operate it.⁴⁹

Dependency on Israel

In addition to the water Israel sells to the Gaza Strip, its control over various aspects of life in Gaza, access to and from it in particular, has a tremendous impact on Gaza's water and sanitation infrastructure.

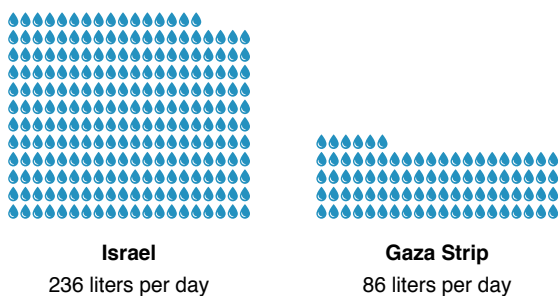
People in Gaza lack clear or accurate information as to what equipment is permitted and what is banned. Some parts or chemicals are entirely banned, but it is not always possible to know which ones in advance, causing difficulties obtaining water purification materials and certain types of pumps

Control over crossing points and the entry of equipment and spare parts.

As presented in the previous chapter, Israeli approval is required for bringing in equipment for various projects, including those operated or funded by international agencies. Bringing in spare parts for Gaza's water infrastructure also depends on Israel. Without spare parts, it is difficult to maintain the water pumping system, as well as water purification and transport. Infrastructure projects are often postponed due to delays in obtaining Israeli approval for the entry of required materials or equipment. Delays and restrictions have resulted in damage to infrastructure.⁵⁰

Since the beginning of 2015, all water-related construction projects run by international organizations must go through the Gaza Reconstruction Mechanism (GRM).⁵¹ Every project requires Israeli approval. Israel looks at the location, the plans and the technical specifications, and has stipulated a requirement that it approve suppliers, contractors and the actual list

The water situation: Consumption per person, 2015



According to the WHO, 100 liters per person per day is the minimum required to maintain health

Source: <http://goo.gl/3zMsPH> ; <http://goo.gl/edF2Jj> ; <http://bit.ly/2cy459>

of materials required for implementation. Only after receiving the approvals can the contractor order the required equipment and start the project. At the time of writing, 44 water projects have received Israeli approval, and five await approval. Seventy percent of these projects are impacted by the restrictions on the entry of dual-use equipment and materials.⁵²

Even when GRM approval is not a requirement, there are limitations and difficulties affecting the entry of required equipment. For instance, Tony Blair, the former Quartet envoy, had to intercede and negotiate with Israel to allow antifreeze for sewage treatment to be brought into Gaza.⁵³ Intervention by such high-level officials is not possible for every element of every project. In addition, people in Gaza lack clear or accurate information as to what equipment is permitted and what is banned. Some parts or chemicals are entirely banned, but it is not always possible to know which ones in advance, causing difficulties obtaining water purification materials and certain types of pumps.

The difficulties and delays in bringing in spare parts, and the resulting lack of certainty that projects will be completed, diminish donor willingness to fund new projects.

War damage. Water and sanitation facilities have been hit over the course of various military operations. For instance, a water reservoir funded by the World Bank was bombed during Operation Protective Edge.⁵⁴ The al-Montar water reservoir in the Shujaiyeh neighborhood was also destroyed, which halted progress on a project aimed at incorporating water purchased from Israel into Gaza wells in order to increase the supply of potable water, thus reducing its cost.

The frequency of military operations and the extent of the damage they cause inhibit the international community from initiating and building infrastructure facilities in the Gaza Strip. Without guarantees for the protection of the facilities, it is difficult to secure


funding, or willingness, to have them built – in addition to the uncertainty surrounding permits to bring in the materials and equipment necessary for building.

Palestinian control over infrastructure

Water and sanitation infrastructure in Gaza are under the purview of several Palestinian agencies including the Palestinian Water Authority (PWA), an independent body subordinate to the Palestinian Authority. It is responsible for water and sewage policy and for safeguarding, managing and developing water sources, distributing water to the different areas, and water supply.

The Coastal Municipalities Water Utility (CMWU) is subordinate to the PWA. Its role is to coordinate the work of 25 Gaza municipalities (excluding Gaza City) and, to varying degrees of success, also non-member municipalities, on water issues. The CMWU is responsible for pumping and distributing


Israel's impact on the water sector in Gaza Strip

- 

Control over the crossings: Restrictions and prohibitions on the entrance of equipment and spare parts
- 

Restrictions on the entrance of equipment: 70% of projects in the water sector are impacted by Israeli restrictions
- 

War damage: During Operation Protective Edge, two major water reservoirs were destroyed
- 

Restrictions on movement: Restrictions on movement of specialists and technicians
- 

Shortage of electricity and fuel (from Israel): Needed for water pumping facilities, desalination and a steady water supply
- 

Limited economic development: Reduces resources that can be allocated to water infrastructure and its maintenance

water, maintaining and developing infrastructure and managing sewage and rainwater treatment. It is also responsible for water and sewage improvement and development plans, water quality improvement and water source development. At present, most members of the CMWU board are Hamas-affiliated mayors. The division of powers between the CMWU and the municipalities is not systematic. The CMWU manages its employees, but they are paid by the municipalities.⁵⁵ In some municipalities, issues arise with respect to cooperation between the municipality and the Palestinian Authority. Cooperation is extremely limited in some localities. In Gaza City, the municipality retains sole responsibility for water. Due to this complex structure, the Palestinian Authority's ability to advance infrastructural projects, especially ones with foreign funding, is limited.

Aside from governmental agencies, some elements of the water supply system are handled by private entities, especially water purification and transport and the sale of potable water. Gaza's sanitation sector has suffered years of neglect, due to low investment rates and limited funding

Aside from governmental agencies, some elements of the water supply system are handled by private entities, especially water purification and transport and the sale of potable water. Gaza's sanitation sector has suffered years of neglect, due to low investment rates and limited funding.⁵⁶ Funding difficulties and political instability have impeded repairs and improvements to the sewage system.⁵⁷ Collection rates from consumers have improved in recent years, but still remain around the 50 percent mark.⁵⁸

Tensions between the various actors also impede improvements. For instance, Palestinian objections in

principal to the inclusion of international water projects in the GRM kept projects on hold for several months, until agreement was reached on their inclusion in the GRM.

Israel's position is that the main reason for Gaza's water crisis is the quality of Palestinian treatment of water sources and damage to the aquifer. According to this position, the Palestinian side must improve water source usage, impose water austerity measures and take a leading role in the use of reclaimed water. Yet, there is no agency in the Gaza Strip that is able to do this.⁵⁹ Israel holds the Palestinian side responsible for stoppages and delays in various past projects, such as the completion of the third water pipeline and the installation of a temporary sewage reservoir.⁶⁰

The role and responsibility of third parties and the international community

Most water infrastructure laid in Gaza in recent years, particularly desalination plants as well as CMWU projects, have been funded by international actors to the tune of hundreds of millions of dollars. Some of the reconstruction funds transferred to Gaza after Protective Edge were earmarked for water infrastructure restoration. International organizations helped, among other things, with urgent repairs following Operation Protective Edge.⁶¹

The international community is also involved in regulating and delegating responsibilities between the various agencies involved. This intervention led to the creation of the CMWU.

What would be required to develop infrastructure that would advance the rights of the population

Improvements must be made to the pipes and the water distribution system. Increased domestic and institutional access to water, and conditions allowing for the purchase of water at a reasonable price and quality are required as well. Use of the aquifer should be scaled back to allow its rejuvenation and future use.⁶²



Maintenance of water infrastructure in Gaza. A third of the water is lost due to defective and damaged pipes.

The various organizations and institutions associated with water and sanitation management in Gaza suggest several solutions that would bring short-, medium and long-term improvements. Below is a list of the suggested solutions:

Short-term

Restrictions on the entry of construction materials and spare parts should be lifted, experts and personnel should be given access necessary sites in Gaza;⁶³ the full 10 mcm of Israeli supplied water should be supplied every year;⁶⁴ Israeli supplied electricity should be increased to allow consistent pumping of running water in homes, and the operation of treatment facilities.⁶⁵

Medium-term

A large scale desalination plant should be built to increase the supply of water without dependency on groundwater (this requires further investment, potentially by the international community).⁶⁶ The required infrastructure improvements include building water reservoirs and developing the

distribution system.⁶⁷

The PWA recommends limited desalination of seawater and use of treated sewage.

Israeli organizations recommend increasing the amount of water sold by Israel to 30 mcm per year.⁶⁸ There is a strategic plan for improvements to the network that would reduce the rate of water loss, and it should be implemented. This requires significant financial resources and guarantees to protect civilian infrastructure on the part of Israel and other parties to the conflict. In addition, better cooperation between the CMWU and non-member municipalities is required.

Long-term

The PWA recommends building large-scale desalination plants.⁶⁹ The CMWU recommends large-scale plans for sewage treatment and water recycling, after the treatment facilities are built.⁷⁰ International agencies recommend building and restoring water and sewage systems, increasing the availability of water and sanitation in homes, schools and medical facilities, and instituting a waste treatment regime suitable for the conditions in the Gaza Strip.⁷¹ ♦



Communications Infrastructure

Situation on the ground

Access to modern means of communication, such as Internet and cell phones, is considered a basic necessity in this day and age. Gaza residents are denied access to advanced services such as high-speed Internet and third generation (known as 3G) networks. Services available in the Gaza Strip are dependent on Israel in every regard – the supply of infrastructure, permits to bring in equipment and permits to use new technologies. Israel's control over communications networks in the Palestinian territory and its ability to limit and monitor use of these means of communication have been referred to as a “digital occupation.”⁷²

In Gaza, communications issues are particularly acute due to its isolation from the rest of the world, and particularly the separation from the West Bank – the other part of the Palestinian territory, where Gaza residents have family, community, commerce and cultural ties.⁷³ Access to advanced communications is critical for economic and technological development and the development and improvement of businesses and public services alike.

Communications issues hinder growth of advanced industry in the Gaza Strip, and the possibility for economic development. Lengthy disruptions in electricity delivery and the lack of access to internationally accepted standards of technology present further difficulties. The lack of access to 3G cellular networks and the inability to work consistently, and choose working hours to suit needs, rather than as a consequence of the rationed electricity supply, seriously compromise competitiveness in the international information and communications technology (ICT) arena.

In addition to improvement and modernization

of the physical network, Gaza needs more cellular providers, frequencies to serve them, and the ability to use advanced 3G and 4G technologies. The dual-use list should also be updated to accommodate maintenance and improvements to the system.

Contributing factors

Israel has had control over Gaza's telephone network since 1967.⁷⁴ It has forbidden Palestinians from developing an independent telephone network.⁷⁵ At certain periods of time, Israel forbade the Palestinians from sending facsimiles and e-mail communications.⁷⁶

The Interim Agreement contains Israeli recognition of Palestinians' right to set up and operate independent telecommunications systems,⁷⁷ institute policy on this issue and select any sort of technology that is suitable for their future.⁷⁸ However, the reality is another thing altogether. Israel has a great deal of control over communications networks, and it severely restricts the Palestinian leadership's ability to institute policy and to operate the required communications networks in the Gaza Strip.

Israel controls and limits the allocation of radio frequencies to the Palestinians, and therefore has the ability to control Palestinian communications and disrupt or take over radio broadcasts in order to restrict information and control content it considers to be propaganda. Israel can, therefore, also shut down communications services. During Operation Protective Edge, Israel targeted a broadcast tower it claimed was used for transmission of propaganda.

Land and cellular telephone communications

In the past, Israel took steps to stop the Palestinian Authority from obtaining its own international dialing code. The Palestinian Authority's international dialing



Workers in a new ICT company in Gaza.

code went into effect in 1999, but calls from Gaza abroad (on either land or cellular lines) run through Israeli infrastructure, and so Israel has the ability to intercept and disrupt calls.⁷⁹ Calls between the Gaza Strip and the West Bank run through the same channels. During Operation Protective Edge, the military sent text messages to Gaza residents, warning them ahead of air raids. Access to information about residents' whereabouts and their cellular numbers demonstrate the extent of Israel's control over telephone networks and how it makes use of this control.⁸⁰

When malfunctions occur in the optical fibers through which communications are transmitted, any repairs require coordination with Israel.⁸¹ This allows Israel the ability to block calls and cut off communications cables and fibers, though it refrains from doing so, partly due to commitments under international agreements.⁸²

Israel controls the allocation of communications frequencies in the oPt. It has previously undertaken to meet future Palestinian requests for frequencies within a month of submission.⁸³ In practice, negotiations between the Palestinian Ministry of Telecommunications and Information Technology and the Israeli authorities over frequency allocations take

years. In 2015, the Palestinian cellular provider Jawwal had access to the exact same frequencies it had 16 years earlier, though its clientele is 20 times what it was then.⁸⁴ The Palestinian Ministry of Telecommunications and Information Technology has been asking Israel to allocate 3G frequencies to the oPt since 2004. Approval was given only in 2015, more than a decade later.⁸⁵ The approval apparently does not cover the Gaza Strip. Approval for a 4G network has not been given yet. The Palestinian Ministry of Telecommunications and Information Technology estimates that if Gaza residents could connect to 3G networks, the number of Internet subscribers there would jump from 95,000 to 600,000.⁸⁶ This will not only reduce the cost of connecting to the network and improve connection quality, it would also help boost development in the Gaza Strip and reduce unemployment, and may, in this manner, help improve the economy.

Israel refuses to allow the cellular provider Watania, which operates in the West Bank, to set up operations in Gaza, giving Jawwal a monopoly over the Gaza market, with attendant high prices.

Gaza's connection to the World Wide Web runs through Israeli infrastructure. The company Paltel purchases services from Israel, and private companies

in Gaza buy from Paltel and sell to consumers in Gaza. Cellular Internet in Gaza is also controlled by Israel. Israel does not allocate network frequencies either for 3G networks or WiMax equipment, which could help increase coverage in Gaza and the quality of information transmitted over the network.⁸⁷ A Gaza technology expert told Gisha that Israel claims a network of this sort would impact the frequencies used by the Israeli military, and therefore, there is a risk that it might be used for espionage.⁸⁸

Entry of equipment and spare parts

As is known, Israeli approval is required for bringing in any type of equipment for network maintenance and development. Israel screens the entry of different types of equipment such as communications cables, optical fibers, routers, microwave devices (which connect between cables in different hubs), and receivers. The dual-use list contains a blanket definition entitled “communications equipment”⁸⁹ or “communications support equipment.” Gisha has received a more detailed list designed for customs agents, which includes fax machines, printer/copiers, ink cartridges, recording devices, telephone devices and more.

Palestinian control over infrastructure

Paltel is a public group of communications companies

that supplies residents of the West Bank and Gaza Strip with Internet and communications services. In Gaza, Paltel is comprised of three companies – the Palestinian Communications Company, which provides telephone landlines and Internet access; the Khadadra company, which supplies Internet services, and Jawwal, which supplies cellular telephone and internet communications.

Gaza also has private Internet service providers. Palestinian companies that wish to provide Internet services must obtain a license from the Palestinian Ministry of Telecommunications and Information Technology.

Until the Gaza Disengagement in 2005, Israeli cellular providers Orange and Cellcom competed for the Gaza market, while Jawwal was just starting out as a new company. The Israeli providers left Gaza after the withdrawal, taking their facilities with them.

Communications companies, like other companies operating in Gaza, have to pay additional taxes imposed by the Hamas authorities. Jawwal refused to pay the additional tax, and in June 2015, Gaza's general prosecutor issued a closure order against it, which was implemented for several days. The company ultimately reached a compromise with the authorities in Gaza, whereby it would fund essential civilian projects in the Strip in lieu of paying the tax.⁹⁰ ♦

1967	1995	1999	2004	2016
Starting in '67, Israel controlled the telephone network in the Strip and prohibited Palestinians from establishing their own telephone network	Israel recognized the right of Palestinians to establish and operate their own communications system and infrastructure. However, Israeli control restricted the ability of Palestinian leadership to set policy and operate a communications network	An international dialing code for the Palestinian network came into effect	The Palestinian Ministry of Telecommunications requested that Israel make available 3G networks to the Palestinian territory	Agreements were reached between Israel and the Palestinian Authority that allowed 3G access in the West Bank, but not in Gaza



The relevant provisions determining the state's obligations to ensure the right of the population to basic services is found primarily in two areas of international law – international humanitarian law (IHL) and international human rights law (IHRL). There are additional provisions specific to obligations related to water, energy, the environment, etc.

Israeli law also contains relevant provisions, both in terms of Israel's responsibilities toward Gaza's residents, and in terms of the scope and content of the rights protected under Israeli law.

International humanitarian law

International humanitarian law regulates the conduct of states during hostilities or occupation and its aim is to minimize harm to the civilian population not taking part in hostilities.

In general, there are four discernable approaches to the legal status of Gaza and the application of IHL:

On one, radical end there is an approach maintaining that the 2005 Disengagement ended the occupation of the Gaza Strip and that Israel has extremely limited obligations towards Gaza. In this interpretation, minimal obligations include allowing essential commodities to reach the civilian population⁹¹ and a prohibition on harming facilities essential for its survival.⁹² Within this camp of thought, there are some who argue that Israel doesn't even have any obligation to allow electricity to reach the Gaza Strip.⁹³ Because it is difficult to reconcile this approach with the situation on the ground, it lacks international support and it is the object of harsh criticism by scholars.⁹⁴ This approach goes farther than Israel's own official position, which recognizes an obligation not to prevent essential commodities from reaching the Gaza Strip.⁹⁵

Another approach is that Israel has effective

control over Gaza, and that Gaza is, therefore, under occupation and all relevant IHL provisions apply. This approach is widely supported by experts and by the international community.⁹⁶

According to a third approach, the end of the occupation is a process, and Israeli control over the Gaza Strip is currently at some stage of this process. Some elements of the occupation are no longer present, while others are. According to IHL provisions, Israel bears responsibilities in the spheres in which it exerts control. This is the "functional approach" to the occupation developed by Prof. Aeyal Gross,⁹⁷ and this is Gisha's position.⁹⁸ This approach is gaining increasing support among experts and the international community.⁹⁹ We note that even those who maintain that Gaza is still under occupation base this conclusion largely on the question of Israel's functional control over Gaza.¹⁰⁰

According to the fourth approach, Gaza is no longer under occupation, but Israel held the Strip under occupation for an extended period of time and continues to exert certain powers over it today. Israel has obligations to the population, which partly stem from the duration of the occupation and the degree of control Israel had in the past (in other words, obligations pursuant to "post-occupation law").¹⁰¹

We note that the jurisprudence of Israel's High Court also contains recognition of Israel's obligations, both as a result of the degree of control it had over Gaza in the past and the dependency that has resulted from it, as well as in areas it still controls.¹⁰² In other words, Israel's High Court has also adopted, to some extent, the approaches that see Israel as having obligations under post-occupation law and under the functional approach to the occupation.

According to IHL, the occupying power's obligations

are more than just to allow minimal humanitarian subsistence, but also to protect residents in the occupied territory, uphold their dignity and ensure they can lead normal lives – obligations recognized in Israeli jurisprudence as well.¹⁰³

Israel held the Gaza Strip under prolonged occupation, and kept hold of significant powers that impact the lives of the population even after disengagement (including control over crossing points and civilian infrastructure, and significant influence over Gaza's economy). In these circumstances, it must ensure residents are able to lead normal lives, in the spheres that remain under its control.¹⁰⁴ The supply of energy clearly meets the criteria of daily essential needs, and allows for a functioning economy. The supply of water of appropriate quality and quantity is essential for respecting human dignity and the ability to lead a normal life as well.

According to an opinion penned by several Israeli experts on international law, which was presented to the Knesset in July 2014, given the types of daily activities in Gaza that are ultimately controlled by Israel, and the dependency Gaza developed on Israel, there is no room to distinguish between Israel's positive obligation to supply Gaza with essential commodities (such as water and electricity), and the negative duty of non-interference in the supply of these commodities.¹⁰⁵ Israel must supply whatever infrastructure depends on it and repair infrastructure damaged in the fighting. The opinion notes that:

Israel and the Gaza Strip are not equal sovereign entities, because Israel controlled Gaza for decades, in a manner that resulted in near complete dependency. Even after disengagement, Israel maintains various powers over the population, including through control over essential infrastructure. Since, in practice, Israel does not allow Gaza to develop this infrastructure

independently, it cannot completely disavow its responsibility to supply it.¹⁰⁶

It appears that the jurisprudence of the High Court also cautiously favors the application of certain positive obligations that go beyond the humanitarian minimum, including the duty to enable means of subsistence and supply lines necessary for a life of dignity. So, for instance, in the Legal Forum for Eretz Yisrael case, the court ruled:

Even if Gaza is currently ruled by Hamas, which has been declared a terrorist organization, there are residents there who need essential services in order to maintain a reasonable and humane standard and quality of living. Israel must lend a helping hand to allow the essential needs of the local population to be met, needs that cannot be met without its help. [...] **The innocent public, living in the Gaza Strip, cannot be kept cut off from basic means of subsistence and supply lines required for a life of dignity, and where securing such means is predicated on cooperation with Israel, the government may, and, in some cases, must, as a result of its responsibility, help get them to their destination.** So it has been ruled, for instance, with respect to the supply of fuel and electricity to the Gaza Strip [...]; and in relation to the medical needs of the local population [...].¹⁰⁷

The “life of dignity” bar, and more than that, “maintaining functioning markets and economy,” is higher than the “humanitarian minimum” and requires allowing development and the ability to lead normal lives. This is a necessary requirement given that the relationship between Israel and Gaza is not short-term (unlike the relationship between combatting armies), but rather a complex and

changing relationship of prolonged control that impacts every aspect of daily life.

Human rights law

The applicability of IHL does not negate the applicability of international human rights law (IHRL). The latter continues to apply always and everywhere, subject to possible derogations during certain states of emergency.¹⁰⁸ States have certain obligations (though more limited in scope) to respect and promote human rights outside of their borders as well. This approach is anchored in authoritative interpretation produced by UN human rights bodies,¹⁰⁹ judgments and opinions issued by international courts¹¹⁰ and the opinions of international law experts.¹¹¹

The obligation to respect and promote human rights has both positive and negative aspects. IHRL imposes three types of duties: respecting rights, protecting them and fulfilling them.

The duty to **respect** a right is primarily a negative duty imposed on the state, meaning the state must refrain from impinging on it (for example, the state must not destroy water sources or prevent people from producing electricity). The duty to **protect** a right means the state must prevent others from harming it (for instance, it must prevent private agencies from polluting water sources). The duty to **fulfill** a right is a positive duty, meaning that the state must take action to promote the right (for instance, build infrastructure). In the socio-economic context, this means the state has a duty to ensure the rights of people who lack the socio-economic means to fulfill their own needs.

Israel, like any other state, has a duty to refrain from impinging on human rights outside of its borders as well, and in particular, a duty not to impinge on the rights of residents who are under its control. The degree of Israeli control over the Gaza Strip (both past and present), its practical ability to promote the protection of human rights in the Gaza Strip, and its

ongoing responsibility for the situation that has been created could, at the very least to some extent, justify the application of positive obligations. The question of Israel's responsibility for protecting the rights of Gaza residents is also impacted by the conditions that have been created in the Gaza Strip, and by the duties and responsibilities of other parties.

Israel's IHRL obligations toward Gaza residents have been recognized by official bodies, experts and commentators. UN treaty bodies, charged with overseeing the implementation of human rights conventions, have consistently demanded respect for the rights of Gaza residents, even after disengagement, in several concluding observations addressing Israel. The issue was also addressed in the concluding observations of the Human Rights Committee (HRC) following Israel's most recent report (of October 2014).¹¹² In its observations, the HRC expressed concern over the closure's impact on Palestinians' enjoyment of basic rights, including the right to food, health, electricity, water and sanitation, as well as over delays in Gaza's reconstruction.¹¹³ The very mention of these rights, which are not normally within the purview of the HRC, is an indication of the importance attributed to them and the severity of the violations – as well as the position of experts and of the international community on these issues.

The Committee on Social, Economic and Cultural Rights (CESCR) mentioned Israel's obligation to protect the rights of Gaza residents both before and after disengagement. In its last session before the committee, in 2010, Israel was asked to clarify what it did to ensure Gaza residents have access to the highest attainable standard of health,¹¹⁴ and what measures it had put in place to ensure Gaza residents receive a sufficient supply of water and appropriate sanitation. In this section, the committee highlighted in particular the restrictions on entry of substances used for water purification and water pumping equipment.¹¹⁵

The committee demanded Israel take measures and invest resources to ensure rights enumerated in the International Covenant on Social Economic and Cultural Rights (ICESCR) are upheld.¹¹⁶

The requirement that states respect human rights outside of their territory is not limited to occupied territory.¹¹⁷ Various documents containing commentary on the ICESCR address state obligations in other contexts as well.¹¹⁸ In other words, the argument that Gaza is no longer under occupation does not absolve Israel of IHRL obligations.

The responsibilities of the various parties

States bear responsibility for any violation of international law, both IHL and IHRL. Israel has obligations pursuant to its control over various aspects of life in the Gaza Strip, and it bears responsibility in cases in which it fails to fulfill its obligations through either act or omission. In this section, we do not delve into the complex issue of the state's and other parties' responsibilities, but offer several basic principles to which states must adhere.

The concept of **shared responsibility** could help shed light on the situation in the Gaza Strip. The responsibility for certain aspects of the situation, and the ability to influence it are not limited to one country/entity. Israel has the capacity to act in certain areas; the Palestinian leadership (the Palestinian Authority or Hamas) has the capacity to act in others. Egypt can influence supplies coming from its territory and the international community also has areas of influence, as detailed below.

All actors involved (meaning actors that have control, influence or responsibility), have a responsibility to fulfill human rights, independently of the fact that other countries may be able to help as well.¹¹⁹ Israel has a duty to respect and promote human rights in the areas under its control, irrespective of other actors. Palestinian actors have a similar duty in the areas

under their control and the international community has certain obligations to support and assist as well. All parties involved have a duty to cooperate in order to achieve the fulfillment of human rights protection - whether by forwarding requests for support and assistance, demonstrating willingness to accept such requests, making contributions, or providing technical assistance.¹²⁰

Aside from the responsibility of all parties involved, Israel has enhanced responsibilities that stem from its prolonged occupation and the development of dependency on it in certain areas; the spheres it still controls; its responsibility for blocking alternatives and the ability to develop alternatives; its responsibility for at least some of the existing shortages (by creating dependency or destroying infrastructure); its ability to influence the situation and the human rights of Gaza's residents both economically and politically. Israel bears no responsibility in the areas in which it relinquished all control.

The notion that the state has certain responsibilities because it is in a position to provide assistance stems from the basic principles of justice. Moreover, international law, particularly in the context of development and the fulfillment of social-economic rights, imposes responsibilities that are attached to states' ability to assist. As such, one of the general comments on the ICESCR notes that states are responsible for assisting others in the fulfilling their duties.¹²¹ This positive duty is also acknowledged with relation to the right to health, and is expressed mostly through the need to provide technical and economic assistance and the like.¹²² The test of the ability to provide assistance is relevant not just for assessing Israel's obligations (regardless of the question of Israel's "culpability" or responsibility for the situation), but also for assessing the obligations of other states and international organizations.

In addition to the obligation to meet concrete

needs and protect individual aspects of the right (to water, to food, to adequate living conditions, etc.), the commitment to human rights also involves general principles that states must follow. These principles include transparency in government action (in Israel's case, transparency is required not just vis-à-vis the Israeli public, but also the Palestinian public that is affected by government policies); the need to give the Palestinian public a voice in decisions related to the fulfillment of its rights; there is a prohibition on discrimination and there must be demonstrable progressive realization of social and economic rights. Progressive realization is required with respect to all rights enumerated in the Convention, and particularly with regard to living conditions.¹²³

States must also take into account a commitment to sustainability. This issue is receiving increasing attention from the international community, which presented a set of sustainable development goals in 2015.¹²⁴

Standards on specific rights

Electricity and energy

Protection for regulated energy (at least to some extent) can be found both in the rules emanating from IHL and in provisions pursuant to IHRL. There is a significant basis in IHL for the concept that electricity is a basic humanitarian necessity that must be made available even during hostilities, and that power plants cannot be targeted, nor electricity supply limited as a sanction.¹²⁵

Energy is an essential condition for the protection of various human rights, including the right to health, the right to water, the right to education and more.¹²⁶ The right to adequate housing includes the right to access energy for cooking, heating and lighting.¹²⁷ The UN Committee on Social Cultural and Economic Rights addressed the need for access to electricity and energy in comments on specific countries, including Israel.¹²⁸

The right to energy includes standards that must be met: accessibility (including non-discrimination in access to energy, physical accessibility, economic accessibility and access to information); quality (in particular safety – no hazards to health or the environment and a preference for clean energy); availability; suitability; regularity, contiguity and reliability.¹²⁹ Respect for human rights requires an energy supply sufficient at least for basic needs such as cooking, lighting, heating of food and maintenance of essential medical services.¹³⁰ There must be a prohibition on arbitrary disconnection from the energy supply necessary for these needs.

The right to water

According to IHL provisions, objects that are essential for the survival of the population, including the water supply, cannot be targeted and in fact must be protected, even during armed conflict.¹³¹ The occupying power has a duty to protect water reservoirs in the occupied territory from over use and compromised quality, and it must regulate water use in a sustainable and environmentally responsible manner.¹³²

Under IHRL, state obligations are more expansive and detailed. They include obligations that fulfill the core of the right (i.e., the necessary minimum), as well as duties that demarcate the scope of the protection. The right to water is an independent right (part of the right to an adequate standard of living) and it is also protected under other rights, particularly the right to health.

Protection of the core of the right necessitates supplying at least the minimum amount of safe water sufficient for personal and domestic needs,¹³³ developing strategic water supply plans and preventing and treating water-borne diseases, especially through proper sanitation. There is also a need to view the supply of water sufficient for the preservation of human dignity as part of the core

obligations connected to this right.¹³⁴

There are no permissible derogations from the core obligations attached to the right to water (including for security reasons).¹³⁵ Moreover, states have an obligation to assist other states to fulfill their core obligations.¹³⁶

The right to water includes the right to a sufficient amount of water (at least for personal and domestic needs: drinking, cooking, hygiene) that is safe for drinking,¹³⁷ as well as to an adequate quality of water.¹³⁸ Physical access to water must be guaranteed in homes, schools and workplaces, or their immediate vicinity, as well as economic access, meaning that the population should be able to afford water. Safe access to water must also be guaranteed (that is, access to water should not involve assuming risks),¹³⁹ and it must be sustainable.¹⁴⁰

Water for agricultural use is considered part of the scope, rather than the core, of the right.¹⁴¹ Water for personal use takes precedence over water for agricultural use. The right to housing includes access to services, facilities and infrastructure (including sustainable access to resources, safe drinking water and sanitation).¹⁴²

The state must utilize the maximum of its available resources in order to ensure the right to water.¹⁴³ Any omission to take necessary measures is also a breach of states' duties. Like any other right listed in the Convention, the right to water must also be realized progressively and retrogression must be avoided.¹⁴⁴

Ensuring a sustainable supply of water includes, among other things, protection from over pumping, water contamination, as well as reduced water waste through the transportation process.

The right to water has a clear extraterritorial dimension. One country must not impinge on the right to water in other countries, including through action taken in its own territory,¹⁴⁵ or through the imposition of sanctions that impeded the supply of water, or equipment necessary

for water supply.¹⁴⁶ Water cannot be used as a means of diplomatic pressure. Moreover, states must facilitate the realization of the right to water in other countries, using the resources available to them (in particular, more developed countries must help developing countries), including by supplying water or by supplying economic and technical assistance.¹⁴⁷ [There is a position that sees this not as an obligation to supply water to the population of another country if said country does not see to it itself, but to provide assistance to the other country. If the supposition is that Gaza authorities do supply a large part of the infrastructure and resources, it is reasonable to point to an obligation to assist them in the realization of the right].

The concluding observations of the Committee on Economic, Social and Cultural Rights on Israel in 2011 specifically referred to water and sanitation in the oPt, expressing concern over the ongoing harm to water infrastructure in Gaza. The committee urged Israel to ensure drinking water and sanitation in Gaza, partly through facilitating the entry of materials required for laying water and sanitation infrastructure in Gaza.¹⁴⁸

Access to means of communication

Access to means of communication, including use of the Internet and cellular phones is acknowledged as part of the right to free speech.¹⁴⁹ The Human Rights Committee has made it clear that states party to the International Covenant on Civil and Political rights must ensure access to these modes of communication.¹⁵⁰ In a declaration supported by 70 member states, the UN Human Rights Council called on all states to promote and facilitate access to the Internet and to cooperate for the purpose of developing communications facilities in all states.¹⁵¹ Internet access can help promote a broad range of human rights, including education, health, employment, increased choice for women and as a consequence, equality.¹⁵² IHRL prohibits the use of kill-switch technologies to disable electronic communications networks.¹⁵³ ♦

Conclusion and Recommendations

The current state of Gaza's civilian infrastructure reflects involvement by multiple parties – Israeli, Palestinian and international. The interests of the various parties are not necessarily congruent, and at times are even contradictory. Each actor influences different aspects of Gaza's infrastructure and yet coordination and even basic contact between them is extremely limited. The supply of energy and water and the entry of equipment are used as political leverage.

One critical step toward substantive improvement in the state of civilian infrastructure is coordination and cooperation among all parties. This is the only way

to ensure and uphold the rights of Gaza residents to adequate living conditions, health, dignity, and human and economic development. Gisha calls on all parties to fulfill their obligations under international humanitarian and human rights law, and as a matter of human decency.

As an Israeli human rights organization focusing on freedom of movement, Gisha's primary interlocutor is our government and as such, we call on the Israeli government to demonstrate responsibility for its actions that affect the civilian population under its control.

Recommendations

- Israel must allow the entry of all materials required for repairing, maintaining and developing civilian infrastructure in the Gaza Strip.
- Israel must allow the entry of equipment and spare parts required for repairing, maintaining and developing infrastructure in the Gaza Strip. Israel must ensure that all security screenings are conducted efficiently and expediently, that applications to bring in equipment required for essential services are prioritized, and that any restrictions on or procedures related to the entry of equipment are publicized and clear.
- Israel must refrain from imposing restrictions that interfere with economic growth and development in Gaza, in order to allow Palestinian actors to meet their obligations and cover the cost of maintaining and improving infrastructure in Gaza.
- Israel must cooperate with regional initiatives for building facilities that would enable an adequate supply of water and energy to the Gaza Strip.
- Israel must undertake to refrain from damaging essential facilities and civilian infrastructure in Gaza during hostilities.

Gisha encourages the international community to continue its support for Gaza's reconstruction and for the development of civilian infrastructure in the Strip through funding, technical and professional assistance, involvement in regional and local projects and the promotion of human rights protection more broadly through diplomacy, in order to help all parties involved respect and promote the rights of Gaza's residents. ♦



Street scene in Gaza. Cooperation between all actors is critical to improve the situation.

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- 2) "Disengaged Occupiers: The Legal Status of Gaza," Gisha, January 2007, <http://bit.ly/2cKe6DH>; "Scale of Control: Israel's Continued Responsibility in the Gaza Strip," Gisha, November 2011, <http://bit.ly/2hUP2tS>.
- 3) Al Mezan press release, May 8, 2016, <http://bit.ly/2gwZJC3>.
- 4) "Factsheet on barrier to trade: Barriers hindering Gaza garment trade with West Bank and international markets" PalTrade, P. 3, 2016, <http://bit.ly/2hvtjMa>.
- 5) "Gaza electricity distribution company: Unprecedented electricity crisis in Gaza." Gisha update, September 17, 2015, <http://bit.ly/2gGI256>.
- 6) Gisha, "Electricity Shortage in Gaza: Who Turned Out the Lights?," May 2010, pp. 3-4, <http://bit.ly/2gX4UKP>.
- 7) HCJ 9132/07 al-Bassiouni v. Prime Minister, para. 12, <http://bit.ly/2hDdMJA>.
- 8) Plans to reduce electricity supply in four out of 10 power lines by five percent each; HCJ 9132/07 al-Bassiouni.
- 9) Israeli initially cut 21 percent of industrial diesel sales and 15 percent of gasoline and regular diesel sales. Further cuts were introduced later on, see, Gisha, "Red Lines Crossed: Destruction of Gaza's Infrastructure," August 2009, p. 11, <http://bit.ly/2hP3bt3>.
- 10) HCJ 4258/08 Gisha and others vs. the Minister of Defense, <http://bit.ly/2d6dfiB>.
- 11) Red Lines Crossed. See supra note 9.
- 12) Gisha, January 2016 "Dark-Gray Lists," <http://bit.ly/28IVobk>.
- 13) Gisha, "Scale of Control," p. 22. See supra note 2, <http://bit.ly/2hUP2tS>.
- 14) E.g., the destruction of seven power lines in January 2009 as a result of Operation Cast Lead. See Gisha press release based on conversations between Gisha's researchers and officials in Gaza, <http://bit.ly/2h6TiKc>.
- 15) E.g., the power plant did not operate for about six weeks, from mid-November 2008 until the end of Operation Cast Lead; in 2013, Israel closed Kerem Shalom Crossing on six occasions, for several days each time, in retaliation for rocket fire from Gaza. See Gisha report, <http://bit.ly/2hzzRIH>.
- 16) In 2012, for example, Israel temporarily barred UN projects for "security considerations related to location." Permits were required, for instance, for UNDP projects for rehabilitation of electricity grids in the Strip and activities undertaken by the Energy Authority to repair the power plant. See COGAT's response to Gisha's Freedom of Information request from May 20, 2015, <http://bit.ly/2hYRkeM>.
- 17) Palestinian Energy and Natural Resources Authority (Arabic), <http://bit.ly/2d3ui5l>.
- 18) Gisha field researcher interview with Gaza Electricity Distribution Company Spokesperson, Mohammed Thabeth, May 2016.
- 19) OCHA, January 2015, p. 6, para. 2, <http://bit.ly/1BN2yHo>.
- 20) Palestinian Energy and Natural Resources Authority (Arabic) 2014, <http://bit.ly/2cy3qF7>.
- 21) See explanation on the National Electric Power Company website, <http://bit.ly/2cmxc1X>.
- 22) WHO, Drinking-water, Fact sheet No. 391, June 2015, <http://bit.ly/1oKpslf>.
- 23) UNICEF, Protecting children from unsafe water in Gaza. Strategy, Action Plan and Project Resources, March 2011, p. 9, <http://uni.cf/2daQqQ5>.
- 24) WHO, Chemical safety of drinking water: Assessing priorities for risk-management, p. 3, <http://bit.ly/2cTgXdQ>.
- 25) Drinking water in Gaza Strip contaminated with high level of nitrate, Helmholtz Centre for Environmental Research (UFZ), <http://bit.ly/2chQdzD>.
- 26) Palestinian Water Authority (PWA), 2015 Water Resources Status Summary Report / Gaza Strip, April 2016, <http://bit.ly/2cqsxOc>.
- 27) Ibid.
- 28) WHO, "Guidelines for drinking water quality," 2006, table on page 91, <http://bit.ly/2cy459P>.
- 29) PWA report, supra note 26.
- 30) Responses of Mekorot and the Israeli Water Authority to Gisha Freedom of Information requests, available here <http://bit.ly/2d3vSUz> and here <http://bit.ly/2cUtzmj> respectively (Hebrew).
- 31) Coastal Municipalities Water Utility (CMWU), 2010 Annual Report, <http://bit.ly/2ctijeo> (Arabic); see also, PWA report 2015, supra note 26.
- 32) PWA report 2015, supra note 26.
- 33) See also UNRWA, "Gaza in 2020: A livable place?," p. 11, <http://bit.ly/1eTqmd2>.
- 34) PWA, Annual Water Status Report 2011, <http://bit.ly/2cmxB4A>.
- 35) UNRWA, "Gaza in 2020: A liveable place?," supra note 33.
- 36) Israeli Palestinian Interim Agreement, signed in Washington, September 28, 1995, Annex III, Art. 40, <http://bit.ly/2gX9nNB>.
- 37) Responses to Freedom of Information requests, supra note 30.

- 38) UNRWA, "Gaza in 2020: A liveable place?" See supra note 33.
- 39) Annual demand for water is 134 mcm for domestic use and 74 mcm for agriculture. Only 61 mcm can be produced safely from pumping and desalination. Water and Energy Crisis in Gaza: Seeking a multi-stakeholder partnership for solutions; Roundtable – UNICEF, PWA, CMWU, 30 April 2014, available here: <http://uni.cf/2cfJrdr>.
- 40) See WHO guidelines, <http://bit.ly/2cTB6yA>.
- 41) PWA report, 2015, p. 5, supra note 26.
- 42) Water, Sanitation and Hygiene. Household Survey, Gaza, 2010, p. 14, <http://uni.cf/2d6gOp4>.
- 43) Water for Life 2007/2008, <http://bit.ly/2cw19d1>.
- 44) UNICEF survey, p. 14, supra note 42.
- 45) Annual Water Status Report 2011, PWAL, <http://bit.ly/2cmxB4A>.
- 46) UNRWA, "Gaza in 2020: A liveable place?" supra note 33.
- 47) Gisha, "Red Lines Crossed: Destruction of Gaza's Infrastructure," p. 28, supra note 9, <http://bit.ly/2hP3bt3>.
- 48) UNICEF (in collaboration with PWA and CMWU), Water and Energy Crisis in Gaza, March 2014, <http://uni.cf/2cfJrdr>.
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- 61) CMWU Annual Report, supra note 58.
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- 70) CMWU Annual Report, p. 80 supra note 58.
- 71) UNRWA, "Gaza in 2020: A liveable place?" p. 12, supra note 33.
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- 75) "How Israel controls digital and cellular space in the OPT", Haaretz, March 31, 2016, supra note 72.
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- 78) Ibid., Art. 36(b)(3).
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- 106) Ibid.
- 107) HCJ 1169/09 HCJ 1169/09 Head of the Legal Forum for the Land of Israel vs. The Prime Minister, MK Ehud Olmert, para. 21 of the opinion of Hon. Jus. Proccaccia,
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