



# Water & Environment

## Background

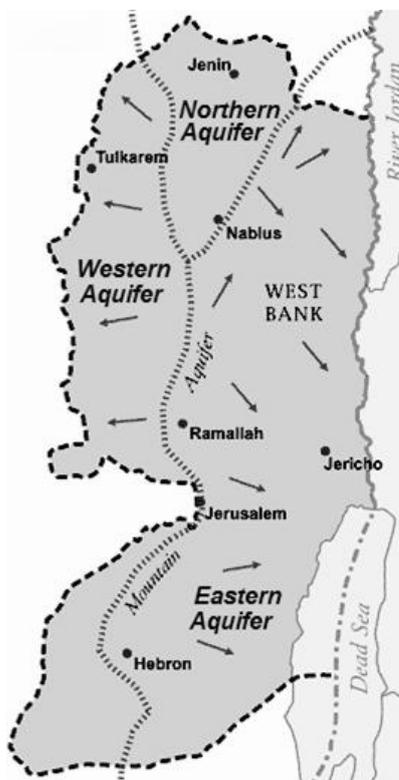
In violation of international law, Israel has since 1967 almost completely controlled Palestinian water resources and deprived Palestinians of access to their rightful share of water. **Military Order (MO) 92** (15 Aug. 1967) transferred the authority over WBGs **water resources** to the area military commander. MO 158 (19 Nov. 1967) forbade the unlicensed construction of new water infrastructures, and MO 291 (19 Dec. 1968) confiscated all water resources, declaring them state property. In 1982, the Israeli Water Authority Mekorot took control. Palestinian wells were destroyed and supplies dried up by widespread digging and pumping from deeper wells for Israeli use.

In the **Oslo process**, water became an interim issue. The **Palestinian Water Authority (PWA)** assumed responsibility, but Israel maintained control of all water use. While Palestinians had asked for 450 million mcm water annually, **Oslo II** provided them - as a temporary measure - with only 118 mcm (28.6 mcm for domestic use), while allotting 483 mcm from the same resources to Israel. Any further increase was made subject to usage of new water resources. Palestinian future needs were estimated at 70-80 mcm/year (Oslo II, Art. 40) and a Joint Water Committee was established, but Israel regularly vetoed Palestinian water projects.

Water Allocation according to Oslo Agreement

Use	Aquifer			
	Western	Northeastern	Eastern	Total
Israel	340	103	40	<b>483</b>
Palestine	22	42	54	<b>118</b>
Additional Quantity for Palestinian Development	-	-	78	<b>78</b>
<b>Basin Total</b>	<b>362</b>	<b>145</b>	<b>172</b>	

Source: PWA, Status Report of Water Resources in the Occupied State of Palestine, 2013.



Since 1995, Palestinians were not allowed to **dig** a single well to use the waters of the Western Aquifer (only the Eastern Aquifer, requiring deep digging at high costs for low-quality water) and in rare cases the North-Eastern Aquifer. In fact, Palestinians have access to less **water per capita** than they did in 1993 and their reliance on purchasing high-priced water from Israel has steadily increased. While Israel confiscates **82% of Palestinian groundwater** for use inside its borders or in its settlements, thereby extracting water above the level determined by Oslo II, Art. 40, Palestinians must **import** from Israel over 50% of their water (UNCTAD, Report on UNCTAD's Assistance to the Palestinian People, Sept. 2016).

Under **international law** which calls for "equitable and reasonable" allocation of water among the parties with a claim to shared watercourses, Palestinians should have full sovereignty over all the Eastern Aquifer resources that lie beneath the West Bank, and at least equitable water rights regarding the Western and Northeastern Aquifers, as these are recharged almost entirely from the West Bank. Under the **law of international watercourses**, as reflected in the related 1997 UN Convention, the State of Palestine is entitled to an equitable and reasonable allocation of shared freshwater resources, including+ those in the four main aquifers and the Jordan River. Under international law, Israel must pay compensation for the past and ongoing illegal use of Palestinian water resources (<http://www.nad-plo.org/howsummer.php>).



### Main Water Indicators

in million m <sup>3</sup> /year	WB	GS	WBGS*
Annual pumped quantity from groundwater wells	64.3**	198.6	262.9
Annual discharge of springs water	39.5	---	39.5
Annual water quantity purchased from Mekorot***	59.3	4.0	63.3
Annual available water quantity	163.1	202.6	365.7
- Annual quantity of water for domestic sector	100.9	104.8	204.7
- Annual quantity of water for agriculture	28.5	95.3	123.8
Annually consumed water	71.9	57.7	128.6
Daily per capita allocation (liter/person/day)	78.8	91.3	
Total losses	29	47.1	

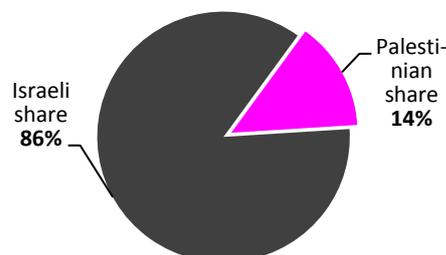
\* excl. Israeli-annexed parts of Jerusalem; \*\* excluding unlicensed wells; \*\*\* incl. pumped water from Mekorot wells located in the WBGS.   
 Source: PCBS/PWA, 2014; PCBS, *Press Release on World Environment Day*, 4 June 2015.

- In June 2017, water supply, sewerage, waste management and remediation activities contributed **0.9%** to the **GDP** (excl. East Jerusalem) (WB: 1.1%, GS: 0.4%) (PCBS, *Quarterly National Accounts*, Q2-2017).

### Water Resources

- Palestine's water resources are **surface water** - Jordan River, Dead Sea, and Wadi Gaza - and **groundwater basins**, eight of which exist in Palestine/Israel: four within Israel proper (Tiberias, Western Galilee, Carmel, Negev basins) and four partially or fully in the WBGS (Coastal, Northeastern, Eastern, and Western **Aquifers**). The **Jordan River** is water **shared** by five riparians (Syria, Lebanon, Jordan, Israel and Palestine) though Israel controls and utilizes the vast majority of its discharge, while Palestinians have no share at all since 1967. By regional standards, Palestinians have the **lowest access** to fresh water resources.

Share of Mountain Aquifer Water



- Israel controls the majority of **renewable water resources** totaling 750 mcm, while Palestinians receive only about 110 mcm (less than the 118 mcm stated in the Oslo II Accord) from the three ground water aquifers in the West Bank (PCBS, *Press Release on the Occasion of Land Day*, March 2016).
- Israel **diverts** water from the Sea of Galilee (Jordan River Basin) for use in coastal towns and the Negev via the **National Water Carrier**. As a result, no natural water flows naturally to the lower part of the Jordan River, which has caused the decrease in the water level of the Dead Sea.
- Palestinians utilize less than **15%** of water from the **ground water aquifers**, while Israelis, including settlers, utilize the remainder, 85%. The Gaza Strip utilizes approximately **18%** of the **coastal aquifer**, Israel the remainder - 82%. (PCBS, *Water Statistics*). This is why **Mekorot sells** Palestinians double the amount of water stipulated in the Oslo Accords - 64 mcm, as opposed to 31 mcm (Amira Hass, "Israel Admits Cutting West Bank Water Supply, but Blames Palestinian Authority", *Haaretz*, 21 June 2016).
- **Israeli household water** use is supplied by two-thirds from desalination plants and one-third from three natural water sources, two of which - Sea of Galilee and the Western Mountain Aquifer - were below their **red lines**, i.e., too dry to be pumped from as of late Sept. 2017 (*Haaretz*, 2 Oct. 2017).
- The **separation barrier** and **settlements** divest Palestinians of their water rights; this is most apparent with regard to the Ariel and Kedumim 'fingers' near Qalqilya, which stretch 22 km into the



northern West Bank, covering some of its most valuable water resources (PLO - NAD. *Barrier to Peace: Assessment of Israel's Wall Route*, July 2008). The barrier has cut Palestinian access to many wells, depriving Palestinians of large amounts of water annually. Israel supplies water to its **settlements** from 38 **wells** located in the West Bank (EWASH, *Killer Facts for World Water Day*, March 2016).

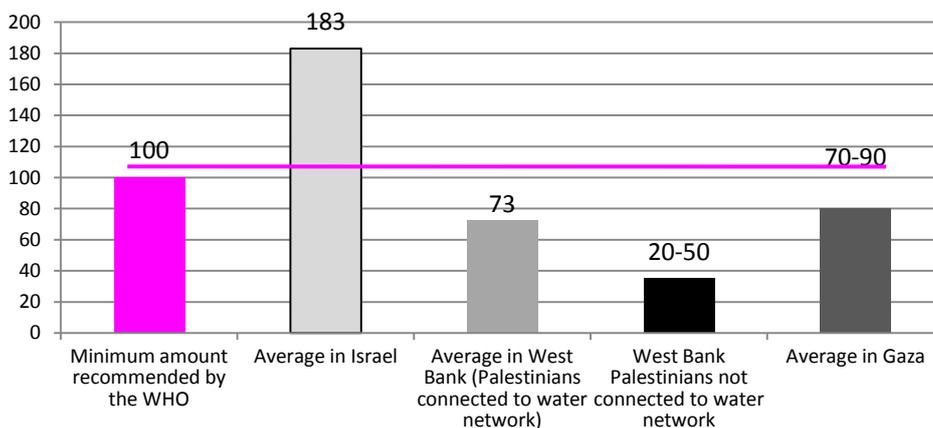
- There is a significant shortage of safe drinking water in **Gaza** as the only water source - the **coastal aquifer** - is severely over-extracted (about 3 times the renewable resources) which has led to increasing saltwater intrusion. Contamination with untreated wastewater is leading to further deterioration. Low water quality has been linked to a high incidence of water-related diseases among the population. The UN estimates that Gaza will have **no drinking water** within 15 years. At present, 97% of Gaza's drinking water does not meet the WHO standards (PCBS & PWA, *Press Release on World Water Day*, 22 March 2016).

### ■ Water Consumption

- Because water data is so highly politicized Israel guards its raw data as a matter of national security, and **consumption** figures vary wildly. According to the World Bank, West Bank Palestinians consume an average of 50 liters of water per day (l/c/d), while the Palestinian Water Authority talks about 73 l/c/d on average and as little as 20 l/c/d in some areas such as the Jordan Valley and southern Hebron Hills. The following table shows the **average daily per capita consumption**, although it must be stressed that over 90% of the water in Gaza is considered unsafe for drinking and the water consumption of Israelis settlers is estimated at twice the Israeli average (according to PCBS/PWA estimates Israeli daily per capita water consumption is even seven times higher than the Palestinians' (PCBS and PWA, *Press Release on the Occasion of World Water Day*, 22 March 2015):



Water Consumption per person/day (liters)



Sources: B'Tselem, Israeli Water Authority, Palestinian Water Authority.

- Due to seawater intrusion application of fertilizers and pesticides and the lack of wastewater treatment groundwater quality is degraded and **does not meet basic standards for human consumption**, forcing residents of Gaza to purchase water from private sellers.

## ■ Water Supply & Demand

- **Groundwater** represents 95% of Palestinian water supply (PWA).
- In 2015, **water networks** were available to 508 of a total of 557 Palestinian localities (WB: 475, GS: 33). The **source** of 172 of these were Israeli springs/wells (Mekorot), followed by 129 linked to the West Bank Water Department and 62 connected through a local authority (PCBS, *Local Community Survey, 2015. Main Findings*, November 2015).
- While over 93% of WBGS households are **connected to water networks** (PCBS), some areas are not: in **Area C**, over 70% of Palestinian communities located there are **not connected** and face serious water shortages (UNCTAD, *Report on UNCTAD's Assistance to the Palestinian People*, 2017).



### Main Source of Water for Palestinian Households (in %)

Region	Public water network	Water tanks & others	Domestic wells	Mineral Water Gallons	Total
West Bank	93.4	24.3	27.6	6.7	100
Gaza Strip	93.0	65.4	0.0	24.9	100
WBGS	93.3	38.4	18.1	13	100

Source: PCBS, *Statistical Yearbook of Palestine 2016*, December 2016.

- The **cost of piped water** supplied from networks is about 5 NIS per cubic meter (m<sup>3</sup>), but residents of the most isolated communities pay between 20 to 50 NIS/m<sup>3</sup> to private vendors depending on the distance and access constraints (UN OCHA, *Humanitarian Bulletin*, July 2016). Palestinians spend almost 8% of their **monthly expenditures** on water, compared a world average of 3.5% (OCHA, *Humanitarian Needs Overview for Occupied Palestinian Territory*, 2016).
- **Water losses** remain high (in excess of 30%) due to out of date pipes and illegal tapping (USAID, *West Bank and Gaza Inclusive Growth Diagnostic*, May 2017).
- On 13 July 2017, **Israel** and the **PA** announced an **agreement** concerning the long-discussed **Red Sea-Dead Sea Canal**, whereby Israel will sell the Palestinians 33 million m<sup>3</sup> of desalinated Red Sea water per year - 10 mcm to Gaza, the rest to the West Bank, at an agreed price of NIS 3.2/m<sup>3</sup> and NIS 3.3/m<sup>3</sup> respectively (Office of the Quartet, *Report for the Meeting of the AHLC*, September 2017).
- The PWA aims to increase **access to alternative water sources**, including the reuse of treated wastewater, large-scale desalination, and harvesting of rainwater. In addition, imports from Israel (Mekorot) to the West Bank will increase by 25 mcm by the year 2022. However, even if this strategy is fully implemented, the supply-demand gap will still be 20 mcm in the West Bank and 67 mcm in Gaza by 2022 (Office of the Quartet, *Report for the Meeting of the AHLC*, Sept. 2017).
- With annual population growth at 2.5% in West Bank and 3.3% in Gaza, an **increase in water supply** of 35 million cubic meters (MCM) will be required over the next 5 years just to maintain the currently inadequate consumption rate of 79.1 l/c/d. Water available for **other uses** (e.g., agriculture, industry, tourism) is already now too limited to help achieve sustainable economic growth (USAID, *West Bank and Gaza Inclusive Growth Diagnostic*, May 2017).
- At present, **Gaza** accesses a total of **180 mcm** of water, mainly from over-abstraction of groundwater (if abstracted at sustainable levels it would be only 50-60 mcm). By 2020, it will need 270 mcm. A large-scale **desalination** plant can secure some 55 mcm of drinking water, but will not be operational before 2022 (Office of the Quartet, *Report for the Meeting of the AHLC*, Sept. 2016).
- Gaza's **existing desalination plant** was inaugurated in Deir Al-Balah in January 2017 but is not fully operational due to lack of fuel. It's initial capacity of 6,000 m<sup>3</sup> of desalinated water a day is to reach approx. 20,000 m<sup>3</sup>/day by 2020, serving 275,000 people in Rafah and Khan Younis with 90 liters of safe drinking water per capita/day (OCHA, *The Monthly Humanitarian Bulletin*, Feb. 2017).

## ENVIRONMENT AND SANITATION

Due to limited areas available, solid waste is often dumped uncontrolled and untreated into the open or burnt. Palestinians face environmental health hazards due to unsafe drinking-water and food, and improper solid and water waste management. In addition, Israeli West Bank settlements discharge untreated wastewater, resulting in contamination of groundwater sources and increased risks of diseases. Moreover, while it is nearly impossible for Palestinians to obtain permits to repair, rehabilitate and construct even basic **water infrastructure**, Israeli forces have destroyed at least 19 humanitarian structures related to water and **sanitation** in 2017 alone (as of late October) (e.g., cisterns, latrines and water tanks) in Area C since the beginning of 2016 (OCHA Demolition System).

### ■ Biodiversity / Flora & Fauna

In concurrence with the changing landscape (coast, mountains, hills, valleys, rivers) there is a rich biodiversity in historical Palestine, which is home to some 51,000 living **species** (flora and fauna). In the WBGs, there are an estimated 30,850 **animal** species (30,000 invertebrates, 373 birds, 297 fish, 92 mammals, 81 reptiles and 5 amphibians) and 2,850 species of **plants** from 138 families. Only 1% of the total West Bank territory is **forested area** (PCBS & Environment Quality Authority, *Press Release on World Environment Day*, 5 June 2017).

### ■ Waste Water & Pollution

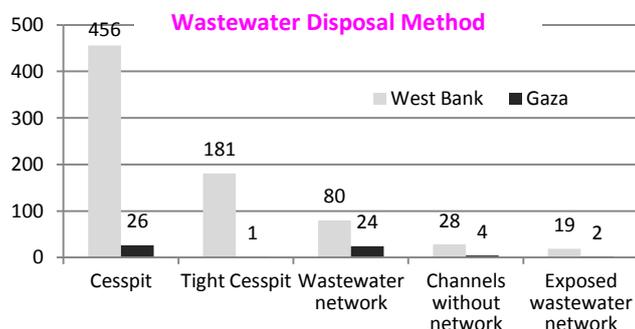
- In 2015, **wastewater networks** were only available to 104 (WB: 80, GS: 24) of the 557 Palestinian localities (WB: 524, GS: 33). In 81 of these, local authorities were responsible for the wastewater network (WB: 59, GS: 22) (PCBS, *Local Community Survey, 2015 - Main Findings*, November 2015).

- In 2015, 53.9% of Palestinian **households** lived in housing units connected to the **public sewage system** (WB: 38.4%, GS: 83.5%) and 45.3% used cesspits (WB: 60.4%, GS: 16.5%) (PCBS, *Housing Conditions Survey 2015*; PCBS, *Household Environmental Survey 2015*).

- In **Gaza**, groundwater **contamination** with untreated waste-water and increasing **salinity** has been linked to a high incidence of water-related diseases among the population. At present, 96.2% of the groundwater is unfit for human consumption (UNICEF State of Palestine Situation Report, April-June 2017).

- While a UN report from 2012 said that Gaza would be **unlivable by 2020**, many experts warn that Gaza has already reached that point. The **shortening or suspension** of sewage treatment cycles has led to increased pollution of the sea along Gaza's coast, with over 108 million liters of **untreated sewage** discharged daily into the Mediterranean Sea (equivalent to 40 Olympic-size swimming pools). This leaves over 60% of the sea contaminated with sewage (Safe the Children, *Gaza: 1 Million Children suffering in 'Unlivable' Conditions*, 4 Sept. 2017).

- The **West Bank** also faces the high **pollution** of the **Jordan River** which runs at a mere 2% of the water it used to carry. Israel diverts about 50% of the water through the National Water Carrier, Jordan and Syria take water of the Yarmouk River, which is the Jordan River's main tributary.



Source: PCBS, *Local Community Survey 2015 - Main Findings*, 2015.



