

## 7. WATER & ENVIRONMENT

(see also the Water Map in the map section of this diary)

### ■ Background

With Military Order (MO) 92 (15 Aug. 1967), Israel 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 context of the **peace process**, water was considered an interim issue; the **Palestinian Water Authority (PWA)** assumed responsibility, but Israel maintained control of the flow and volume of water to be used by Palestinians. While Palestinians had asked for 450 million m<sup>3</sup> (mcm) water annually, Oslo II provided only 28.6 mcm for domestic use; any additional increase was subject to usage of new water resources. The future needs of the Palestinians on the WB were estimated at 70-80 mcm/year (Oslo II, Art. 40).

According to **international law**, 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. The Palestinians accept international law and how it governs the allocation of freshwater resources shared by Israel and the OPT. 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>).

### Water Indicators, 2004:

	WB	GS	WBGS
Annual Available Water Quantity (million m <sup>3</sup> /year)	150.9	144.8	295.8
Annual Pumped Quantity from Groundwater Wells (million m <sup>3</sup> /year)	55.0	141.1	196.1
- of which → for agricultural use:	30.1	75.0	105.1
→ for domestic use:	24.9	66.1	91.0
No. of wells	287	4,105	4,392
- of which → for agricultural use:	248	4,000	4,248
→ for domestic use:	39	105	144
Annual Discharge of Springs Water (million m <sup>3</sup> /year)	52.7	---	52.7
Annual Quantity of Water Purchased from Israeli Water Company (Mekorot) (million m <sup>3</sup> /year) <sup>1</sup>	43.2 <sup>2</sup>	3.7	46.9 <sup>2</sup>
Annual Quantity of Water Supply for Domestic Sector (million m <sup>3</sup> /year)	73.02	69.83	142.85
- of which → from wells:	24.90	66.09	90.99
→ from agric. wells:	3.91	---	3.91
→ from springs:	5.40	---	5.40
→ purchased:	38.81	3.74	42.55
Daily allocation per capita (domestic sector) (liter/capita/day)	97.3	143.0	107.5

<sup>1</sup> incl. pumped water from wells located in the WBGS but controlled by Mekorot.

<sup>2</sup> Of which only 4,408 m<sup>3</sup>/year are for agricultural use (Tubas area), while the rest is for domestic use.

Source: PCBS, *Water Statistics in the Palestinian Territory 1998-2004*; figures from the Palestinian Water Authority.

### ■ Water Resources

- There are 8 **groundwater basins** in Palestine/Israel, four of which lie within Israel proper (Tiberias, Western Galilee, Carmel, Negev basins), while the other four are located partially or totally in the WBGS (North-Eastern, Eastern, Western, and Coastal aquifers). The total available water of all eight basins is about 2,634 mcm/yr on average, of which 1,454 mcm/yr emerge from groundwater, 965 mcm/yr is Jordan River surface water and 215 mcm/yr is surface runoff (e.g. from rainwater).
- **Israelis control** and utilize 89% of the total water resources. Of the groundwater resources (recharge), Israelis control 86% and utilize 83% of them on average; of the surface water resources, they control 90% and utilize all of the Jordan River waters after Syrian, Lebanese, and Jordanian use; and of the runoff waters, Israelis control 82% and utilize 90% on average.
- The **Jordan River** is shared water shed by 5 riparians (Syria, Lebanon, Jordan, Israel and Palestine) though Israel controls and utilizes over 65% of its discharge, while Palestinians have no share at all since 1967 (Syria: 11%, Lebanon: 0.3%, Jordan: 23.4% (PWA, *Water Resources*, at <http://www.pwa-pna.org/status/res.php>).
- The **Gaza aquifer**, which lies below the Katif Block, is the only water source in Gaza and is already over-abstracted. The aquifer has a sustainable yield of about 96 mcm per year (to this can be added another 14 mcm of potentially reusable effluent that is dumped because of a lack of infiltration infrastructure), but some 140 mcm was used in 2003 (with the settlements consuming 7-10 mcm of this). (World Bank, *Disengagement, the Palestinian Economy and the Settlements*, June 2004).

- According to the Israel's Water Commission's 2004 annual report, published in Oct. 2005, the salinity level of the water in the **coastal aquifer** - one of Israel's three major sources of potable water - is continuing to increase (10% in the last 15 years), and less than half its pumped water is of good quality due to pollution from sewage and fertilizers, as well as years of over-pumping. (*Ha'aretz*, 12 Oct. 2005).
- Currently, only 328 **wells** are **operational** in the WBGS (compared to 774 in 1967), because many have dried up due to shallow depths or were located in closed military areas. (PA Medium-Term Development Plan 2005-2007).

## ■ Water Supply & Demand

### Main Water Sources & Means of Obtaining Water, 2005

	WB	GS	WBGS		WB	GS	WBGS
Main Water Source of Network <sup>(1)</sup> :				Main Mean of Obtaining Water <sup>(2)</sup> :			
- Jerusalem Water Undertaking	55	--	55	Public Water Network	86.7	97.9	90.5
- West Bank Water Dept.	109	--	109	Water Tanks	9.2	2.5	6.9
- Mekorot (Israel)	117	4	121	Domestic Well	8.1	--	5.4
- Well or Spring	48	24	72	Spring	1.0	0.1	0.7
- Other	56	1	57	Other	0.3	1.8	0.8
- No Network	183	1	184				

Source: <sup>(1)</sup> PCBS, *Local Community Survey*, 2005; <sup>(2)</sup> PCBS, *Household Environmental Survey*, 2005.

- In 2005, 316 of the 521 local authorities in the WBGS were connected to water networks, while 205 were not. Of those which were, 117 had **Mekorot** as main water supplier, 99 the **West Bank Water Dept.**, 55 the **Jerusalem Water Undertaking**, 53 **wells or springs** and 81 **other** sources. (PCBS, *Local Community Survey*, 2005).
- In 2005, **public water networks** were available to 90.5% of the Palestinian households. (PCBS, *Household Environmental Survey 2005*).
- Water **demand** was estimated at 554,000 cubic meters in 2005 and is projected to increase from to 785,000 by 2020. (PA Medium-Term Development Plan 2005-2007).
- The OPT currently has **access** to only 245 mcm of water a year, which amounts to 105 cubic meters per capita. This is substantially lower than Israel and other countries in the region. (PA Medium-Term Development Plan 2005-2007).

### Water Production and Consumption (in cm) by Governorate, 2004

	Water Production (Mekorot & PWA Wells)	Water Consumption	Daily per capita allocation (l)		Water Production (Mekorot & PWA Wells)	Water Consumption	Daily per capita allocation (l)
Bethlehem	12,921,855	5,562,680	200.5	Qalqilya	440,080	126,149	119.2
Hebron	8,872,039	9,453,772	53.0	Ramallah	4,706,610	2,181,617	133.4
Jenin	2,627,323	1,932,706	54.7	Salfit	434,080	115,608	76.0
Jericho	784,000	67,423	206.8	Tubas	724,910	4,624,469	41.8
Jerusalem	2,490,107	1,429,701	128.6	Tulkarem	286,033	268,042	112.1
Nablus	2,514,550	1,494,823	84.9	Gaza Strip			143.0

Source: Compiled from the West Bank Water Department, except daily per capita allocation: PCBS, 2005 (PWA figures).

## ■ Water Consumption

- **Annual per capita consumption** in Israel is four times higher than in the WBGS; if industrial water consumption is included, it reaches in Israel 128 m<sup>3</sup> (350 l/person/day) or five times the Palestinian average (70 l/day). (<http://btselem.org>)
- **Agricultural consumption**: takes up some 60-70% of the water resources; depends heavily on rainfall as less than 5% of the total land area in the WB is irrigated, while Israel irrigates more than 50% of its cultivated land (see also section on Agriculture). Israeli settlers in the WBGS consume six times more and Israelis beyond the Green Line approx. three times more than the Palestinians.
- **Household water consumption per capita** in the OPT is around 50 liters per day, half the minimum level recommended by the WHO and substantially lower than other countries in the region. (PA Medium-Term Development Plan 2005-2007).
- In the WB, some 88% of the households evaluate their **water quality** as good (11.2% as fairly good and 0.8% as bad), whereas only 13.3% in Gaza do (60.1% as fairly good and 26.6% as bad). (PCBS, *Water Statistics in the Palestinian Territory, 1998-2004*).



## ■ ENVIRONMENT AND SANITATION

- In 2005, **public water networks** were available to 90.5% of the Palestinian households. (PCBS, *Household Environmental Survey 2005*).
- Only 44.7% of Palestinian households were connected to a **wastewater network** (PCBS, *Household Environmental Survey 2005*).
- In 2005, the **wastewater disposal method** of 44.7% of WBGS **households** was the sewage network, while 51.9% used cesspits, and 3.4% used other methods (PCBS, *Household Environmental Survey 2005*). The by far most used method in the 521 local authorities in the WBGS was the **cesspit**. (PCBS, *Local Community Survey, 2005*).
- In 2005, there were 184 **dumping sites** in the WBGS (WB: 161, GS: 3) (PCBS, *Local Community Survey, 2005*).
- In 2005, the majority of Palestinian localities (56%) was provided with some form of **solid waste collection** services, in most cases – 68.9% - by the respective local authorities (else by UNRWA, private companies and other collectors). However, some 166 West Bank localities – almost half of them in the Hebron district - had no such services. (PCBS, *Local Community Survey, 2005*).

### Recommended Research Sources:

<http://www.pwa-pna.org/index.html> (Palestinian Water Authority)      <http://www.arij.org>  
<http://www.phg.org> (Palestinian Hydrology Group)                      <http://waternet.rug.ac.be/>  
<http://www.idrc.ca/waterdemand/>    <http://home.birzeit.edu/ceohs/>  
<http://www.al-bab.com/arab/env/water.htm>                                      <http://www.pengon.org/>  
<http://www.nad-plo.org/hwater.php>    [http://www.pcbs.org/n\\_resour/w03tab\\_lst.aspx](http://www.pcbs.org/n_resour/w03tab_lst.aspx)  
<http://www.unu.edu/unupress/unupbooks/80859e/80859E00.htm#Contents>

**Allan, J.A., and C. Mallat.** *Water in the Middle East – Legal, Political and Commercial Implications*. London, 1995.  
**B'Tselem,** *Disputed Waters: Israel's Responsibility for the Water Shortage in the Occupied Territories* (September 1998).  
**B'Tselem,** *Thirsty for a Solution*, July 2000.  
**Feitelson, E. & M. Haddad.** *Joint Management of Shared Aquifers*. Jerusalem, 1995.  
*From Scarcity to Security: Averting a Water Crisis in the Middle East*. Washington, DC: World Bank, 1997.  
**JMCC,** *Water*. Jerusalem, 1994.  
**MOPIC,** *Regional Plan for the West Bank Governorates: Water and Waste Water – Existing Situation*. Dec. 1998.  
*Not Even a Drop – The Water Crisis in Palestinian Villages Without a Water Network*. B'Tselem, 2001.  
**PASSIA.** *Water - Special Bulletin*. Jerusalem, 2002. (available at [www.passia.org](http://www.passia.org)).  
**Trottier Julie.** *Hydropolitics in the West Bank and Gaza Strip*. Jerusalem: PASSIA, 1999.  
*Water in Palestine – Problems, Politics, Prospects*. Edited by Fadia Daibes. Jerusalem: PASSIA, 2003.

