



7.

WATER AND ENVIRONMENT

► GENERAL BACKGROUND

With Military Order (MO) 92 (15 Aug. 1967) Israel transferred the authority over WBGS water resources to the area military commander; private owners and communities lost control. 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 1986, Israel reduced the quotas for the amount of water to be pumped from wells in the WBGS by 10%, which resulted not only in widespread scarcity, but also in a drop in the water table and increased salinity. Additional loss of available water due to leaky pipes is estimated at 30%.

In the context of the peace process, water was considered an interim issue; the Palestinian Water Authority (PWA) assumed responsibility. The 1995 Oslo II Accord stipulated that during the interim period Israel will maintain the control of the flow and volume of water to be used by Palestinians. While Palestinians had asked for 450 million m³ (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). It should be noted that although the pretext is security, the desire of Israel to control water resources is in fact one of the main reasons why Israel is reluctant to transfer more territory to the PA.

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. In 1999, experts estimated the compensation for damages to Palestinian water resources caused by Israel, and for Palestinian water used by Israel over the years at a minimum of \$45 billion (Jad Isaac, *Water and Palestinian-Israeli Peace Negotiations*, presentation at the Center for Policy Analysis on Palestine, 19 Aug. 1999).

► WATER RESOURCES

Ground Water: Major water resource in the WBGS, mainly from rainfall stored in aquifers (although 75% of the total rainfall evaporates), return flow from irrigation, sewage effluent, and water leakage from pipes. Some 80% of WBGS ground water is exploited by Israel, accounting for 25%

The annual renewable groundwater in the WB aquifers is estimated at 630 mcm and at 42 mcm

settlers have 30 mcm; the rest (81% or 460 mcm) is directly diverted to Israel. In Gaza, 28-40 Israeli wells pump out an average water use of 758 m³ per capita, while some 1,900 Palestinian wells pump out an average water use of 137m³ per capita. According to World Bank estimates, the gap between demand and available supply of water will be at 32% in 2000 and at 55% in 2020 (or -67% if the terms of Oslo II apply).

The Gaza coastal aquifer used to be partially re-charged from the Wadi Gaza coming from Hebron but Israel stopped its flow. It has an annual safe yield of 55 mcm, but is currently being over-pumped at the rate of 120 mcm per year. Israeli settlers in Gaza are extracting 10-12 mcm annually from the aquifer without paying for it, while Mekorot sells some 5 mcm to the PA at NIS 1.3 per m³.

Natural Springs: There are some 527 springs in the WB with an annual discharge rate of 35-40 mcm; springs and cisterns provide ca. 5% of the available water in the WB.

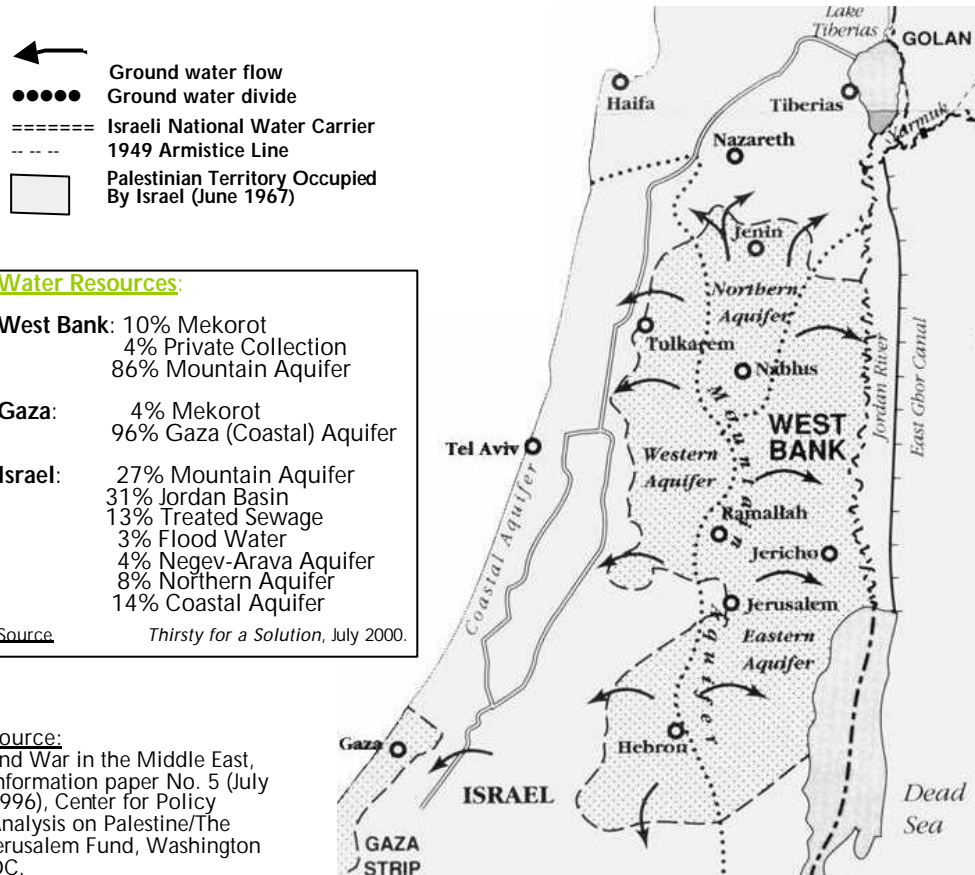
Wells: Of the 750 Palestinian wells existing prior to 1967 only some 350 are still functioning, providing ca. 53% of the total quantity of water available from WB wells.



Fact Sheet **WATER AND ENVIRONMENT**

Surface Water: The Jordan River is the only permanent surface water source in Palestine, but 75% of its water is diverted by Israel before it reaches the West Bank.

Flood Water: Annual flood water (in the WB some 45-64 mcm) could be used for agricultural irrigation but due to the lack of dams it is thus far not being utilized enough and mainly runs into dry valleys.



Source:
 and War in the Middle East, Information paper No. 5 (July 1996), Center for Policy Analysis on Palestine/The Jerusalem Fund, Washington DC.

MAIN BASINS IN THE WB (ART. 40, OSLO II AGREEMENT) (m³/year)

Basin	Israeli Consumption	Palestinian Consumption	Quantity available for development	Total estimated yield
Western	340	22	-	362
North Eastern	103	42	-	145
Eastern	40	54	78	172
Total	483	118	78	679

(Source: MOPIC, *Regional Plan for the West Bank Governorates Water and Waste Water*. Dec. 1998.)



WATER RESOURCES AND USE REGIONAL COMPARISON

	Israel	Jordan	WBGs ¹	Syria	Lebanon
Resources (billion m ³ /year)	2.1	0.8	0.2	5.5	4.8
Consumption (billion m ³ /year)	1.9	1.0	0.2	3.2	0.8
Per capita consumption (m ³ /year)	375	213	115	385	1.200
Renewable resources ² (m ³ /capita/yr)	290	229	134	1,861	1,199
Groundwater (% renew resources)	60	28	94	16	63
Groundwater use (% of recharge)	n.a.	155	200 (GS) 88 (WB)	143	n.a.
Dependency ratio (% from outside the country)	15	20.7	5.7 ³	80	0.8
Water use ' (% of water resources)	122	91	88	48	27
Agricultural use (% of total)	65	69	82	98	68

¹ Based on Oslo II ² Global average = 7,500 m³/cap/year ³ Water supplied by Mekorot; excl. WB aquifers.

(Source: World Bank. *West Bank and Gaza Update*, Second Quarter 1999; World Bank. *From Scarcity to Security Averting a Water Crisis in the Middle East and North Africa*, Washington, DC, 1995.)

► **WATER CONSUMPTION**

Palestinians in the WBGs are currently using 246 mcm annually to supply their domestic, industrial and agricultural

consume 75 mcm of s annual allocation, Palestinians have 93 mcm for industrial use, 153 mcm for agricultural use, and only some 26 m³ (Israelis: 128 m³) per capita domestic consumption. (Jad Ishaq, *The Palestinian Water Crisis*. Center for Policy Analysis on Palestine, Wa *Thirsty for a Solution*, July 2000). As of late Aug. 2000, Israel supplied 26.4 mcm water to the PA and 35.7 mcm to Jordan (5 Oct. 2000).

Annual per capita consumption: amounts to ca. 112 m³ in the WB and to 105 m³ in Gaza. These numbers have remained constant since 1967 despite a considerable population growth. In Israel, the per capita water consumption is 404 m³ per year. (Average human consumption globally is said to be 800 m³ per person per year).

Non-agricultural Consumption (liters/days/person): Israel: 350 l, WBGs: 70 l (WB: 88, GS: 60); in comparison, Turkey: 509 l, Egypt: 337 l, Jordan: 153 l. *Thirsty for a Solution*, July 2000).

Agricultural consumption: some 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.

Required amounts (Palestinians, mcm/year) for the year 2010 are estimated as follows:

	Actual Consumption	Actual Demand	Projected Demand (2010)
Domestic	92	116 ¹	228 ³
Agricultural	150	80 ²	200
Industrial	(inc. in domestic)	8	25

Notes: ¹ equals 120 l/c/d ² to recover the depleted Gaza aquifer ³ or 170 l/c/d

(Source: PWA, *A Technical Framework Regarding the Water Issues*, Conference paper (BZU), June 1999.)



► **ENVIRONMENT & SANITATION**

- Only 37.5% of Palestinian households are connected to the sewage system. In unconnected areas (villages and most refugee camps) the wastewater is discharged into percolating pits or septic tanks and either emptied by vacuum trucks or disposed into the wadis, posing an environmental hazard to the underground aquifers.
- The solid waste of 69.5% of the WBGS households is collected by local authorities, the remainder disposes their solid waste by either burning or throwing it into a dump.
- Of WBGS industrial establishments, less than 5% treat their solid waste and less than 3% their waste water (which is mainly disposed via the sewage network).

SOLID WASTE COLLECTION IN THE WB

District	Solid Waste Collection		Dump Sites	
	% of localities	% of pop.	% of localities	% of pop.
Jenin	37	79	23	61
Tulkarm	42	85	28	54
Nablus	44	75	12	49
Ramallah	39	71	20	46
Jerusalem	63	82	56	70
Jericho	19	73	9	48
Bethlehem	5	35	5	7
Hebron	15	79	7	35

(Source: MOPIC, *Regional Plan for the West Bank Governorates Water and Waste Water*. Dec. 1998.)