FINAL

Palestinian Water Authority

STATUS REPORT OF WATER RESOURCES
IN THE OCCUPIED STATE OF PALESTINE-2012

YEAR OF FLOOD WATER HARVESTING

October 2013

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Abbreviations and Acronyms

EAB	Eastern Aquifer Basin
HSI	Hydrological Service of Israel
JV	Jordan Valley
JWC	Joint Water Committee
Mm	millimetres
LA	Lower Aquifer
l/c/d	litre per capita per day
MCM	Million Cubic Meter
MCM/Y	Million Cubic Meter per Year
NEAB	North-eastern Aquifer Basin
oPS	occupied Palestinian territory
PMU	Project Management Unit
ppm	Parts per Million
PWA	Palestinian Water Authority
UA	Upper Aquifer
WAB	Western Aquifer Basin
WBWD	West Bank Water Department
WWF	World Water Forum

Executive Summary

Rainfall is the source of groundwater and surface water resources in the occupied Palestinian State (oPS). Rainfall in the oPS shows considerable spatial and temporal variation, with long-term annual average rainfall of 450 mm/y in the West Bank and 327 mm/y in the Gaza Strip. During the 2011/2012 season (1 September to 31 August) the total average rainfall was a significantly higher with 518 mm/y in the West Bank and 372 mm/y in Gaza. This translates into a rainfall volume of 2926 MCM over the West Bank and 136 MCM/y in the Gaza Strip; out of this total about 720 MCM and 64 MCM is estimated to have recharged the groundwater systems in the West Bank and the Gaza Strip respectively.

Since Israel is fully controlling the Jordan River, the available surface water in oPS is limited to wadi runoff, which is presently barely utilized. The total flow of the West Bank wadis was estimated at 179 MCM in 2011/2012.

In the West Bank three main groundwater basins are dominant; these are all shared with Israel. In 2012, about 64 MCM has been extracted by Palestinian pumping wells, while an unsustainable 189 MCM was extracted from the coastal aquifer in the Gaza Strip. Around 95% of the pumped water in the Gaza Strip is now brackish. Meanwhile, the total springs discharge from the three West Bank aquifers is around 39 MCM, excluding the discharge of 100 MCM from Dead Sea springs that are controlled by Israel. In general, the report shows that for 2012 the total local water resources (including wells and springs) available for all purposes for Palestinians was some 289 MCM; about 104 MCM in the West Bank and about 185 MCM in Gaza Strip. This does not include bulk water purchases from Israel (about 57 MCM, 53 MCM for the West Bank and 4 MCM for Gaza).

1 Introduction

Groundwater is the main source of water for the Palestinians in the West Bank and Gaza Strip and provides more than 90% of all water supplies. The main aquifer systems can be divided into four distinct units; the Western Aquifer Basin, the North-eastern Aquifer Basin and the Eastern Aquifer Basin for the West Bank, and the Coastal Aquifer for Gaza, where the groundwater is found at much shallower depth.

Following the 1967 occupation, Israel controls all shared water resources including surface and groundwater, and utilizes more than 85% of these resources, leaving less than 15% for Palestinian use. The surface water in oPS is represented by several seasonal wadis, as well as the Jordan River, which is currently controlled and used exclusively by the Israelis.

The oPS is among the countries with the scarcest renewable water resources per capita; average domestic water consumption is only 72 l/c/d in the West Bank; it is higher at 90 l/c/d in Gaza (but the water quality there is far below all standards). This is significantly below the per capita domestic water delivery in other countries in the Middle East, constraining economic development, increasing infrastructure and running costs and possibly leading to health problems[1]. More than half of the available groundwater is used for domestic water supply, severely limiting the available volume for industry and especially irrigated agriculture.

The water situation in Gaza is much worse than on the West Bank. The Coastal Aquifer in the Gaza Strip receives an average annual recharge of 50-60 MCM/y mainly from rainfall, while the annual extraction rate of this aquifer complex is estimated at about 185 MCM in 2012. These unsustainably high rates of extraction have led to the lowering of the groundwater level, the gradual intrusion of seawater and upwelling of saline groundwater. In fact it is believed that the Gaza Aquifer has already passed the point of no return and needs to be regenerated before it can be sustainably used again, leaving the population of the Gaza Strip without a reliable and affordable water source.

This report gives a general overview of the current water resources available for Palestinians covering both local resources and nonconventional sources.

[1] See Guy Howard and Jamie Bartram, Domestic Water Quantity, Service Level and Health, WHO 2003

2 Water Resources

2.1 Rainfall and Recharge

The climate in the Palestinian territory is Mediterranean in its basic pattern, and varies from semi-arid in the west to extremely arid in the east and southeast.

West Bank Rainfall

The mean annual rainfall in the West Bank varies from about 700 mm in the western part to less than 100 mm in the east; the long-term annual average is about 450 mm. The analysis of the rainfall trend during the past years shows an increase of the mean and a shift towards the mid west region of the West Bank. In this area the 2011/2012 rainfall peaked at 700 mm/y, while in the east it was as low as 100 mm/y. The average annual rainfall for the hydrological year (September 2011 - August 2012) for the entire West Bank was about 518 mm.

For the West Bank Figure 1 shows the spatial distribution for the average annual rainfall in 2011/2012 and for the long-term annual average rainfall. The annual rainfall displays an extreme spatial distribution, the spatial rainfall variation is uneven, and the areas receiving different amounts of rainfall are not of the same size. Figure 2 shows the historical records of annual average rainfall in the West Bank.

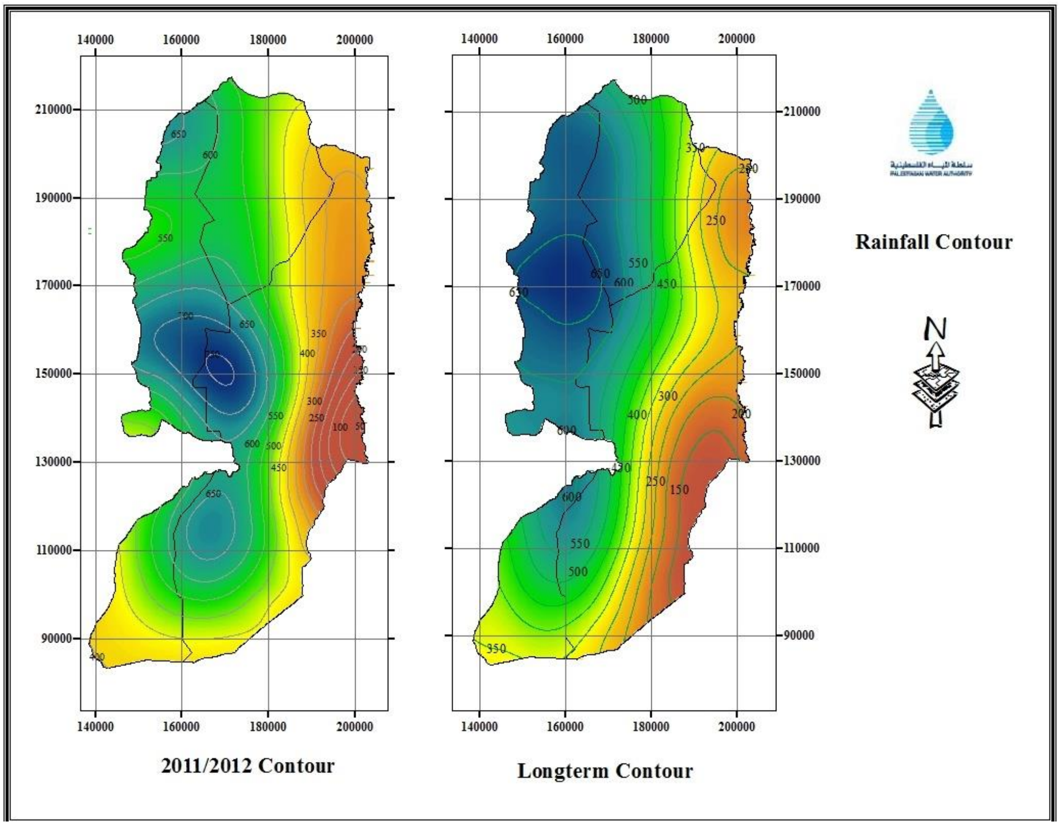

Figure 1: Rainfall contour maps for the West Bank, 2011/2012 season and long term average

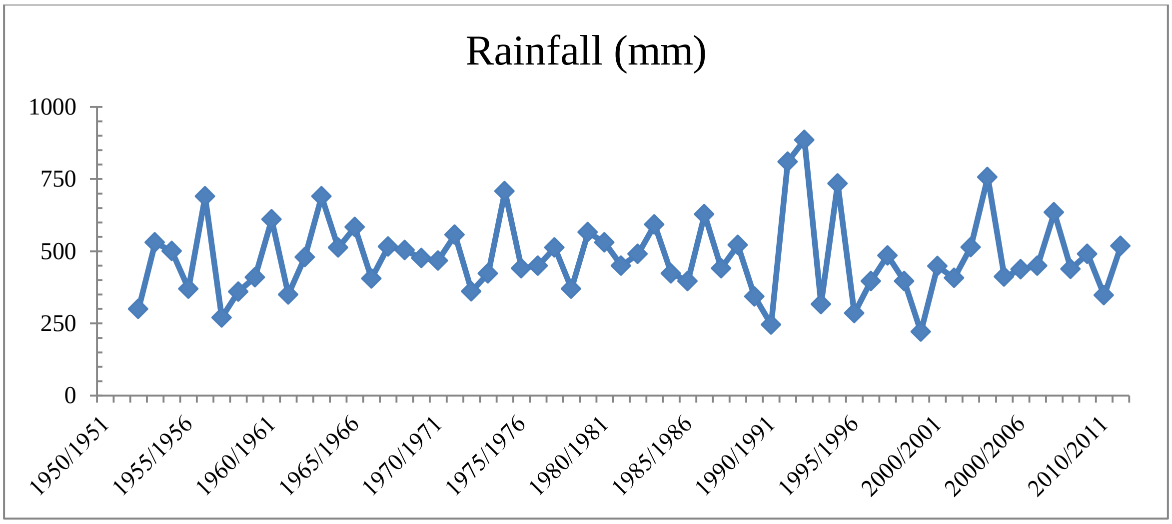

Figure 2: West Bank long-term average rainfall, hydrological years

Gaza Rainfall

In the Gaza Strip, the average normal rainfall is calculated over the period 1981-2010 for 12 stations as shown in Figure 3. The figure shows clear increases in rainfall totals for the hydrological year of 2011/2012 compared to 2010/2011. In the season 2011/2012 the average annual rainfall over the Gaza Strip is estimated at about 372 mm, while the long term annual average rainfall in Gaza is 327 mm. Figure 4 presents the spatial distribution of annual rainfall for the 2010/2011 season.

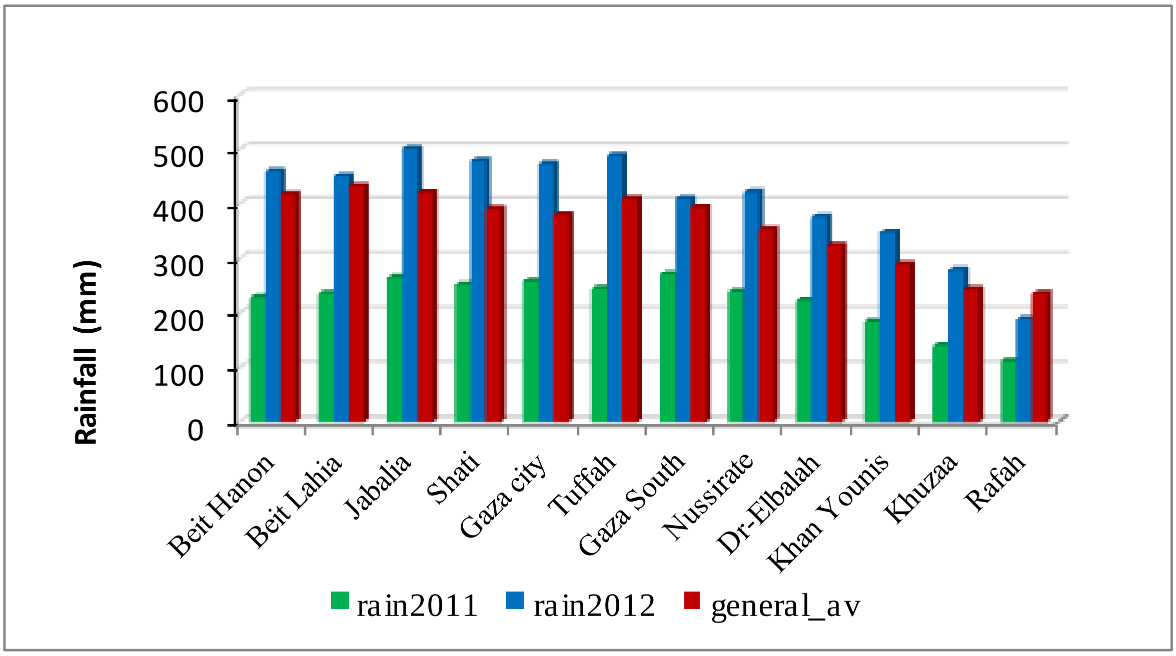

Figure 3: Annual rainfall in the Gaza Strip, average and seasonal

The annual rainfall in 2011/2012 has exceeded the normal seasonal average at all stations. In contrast, annual rainfall was low during the 2010/2011 season, averaging only 225 mm for the Gaza Strip. Rainfall is unevenly distributed; it varies considerably, decreasing from the north to the south with large fluctuations from year to year.

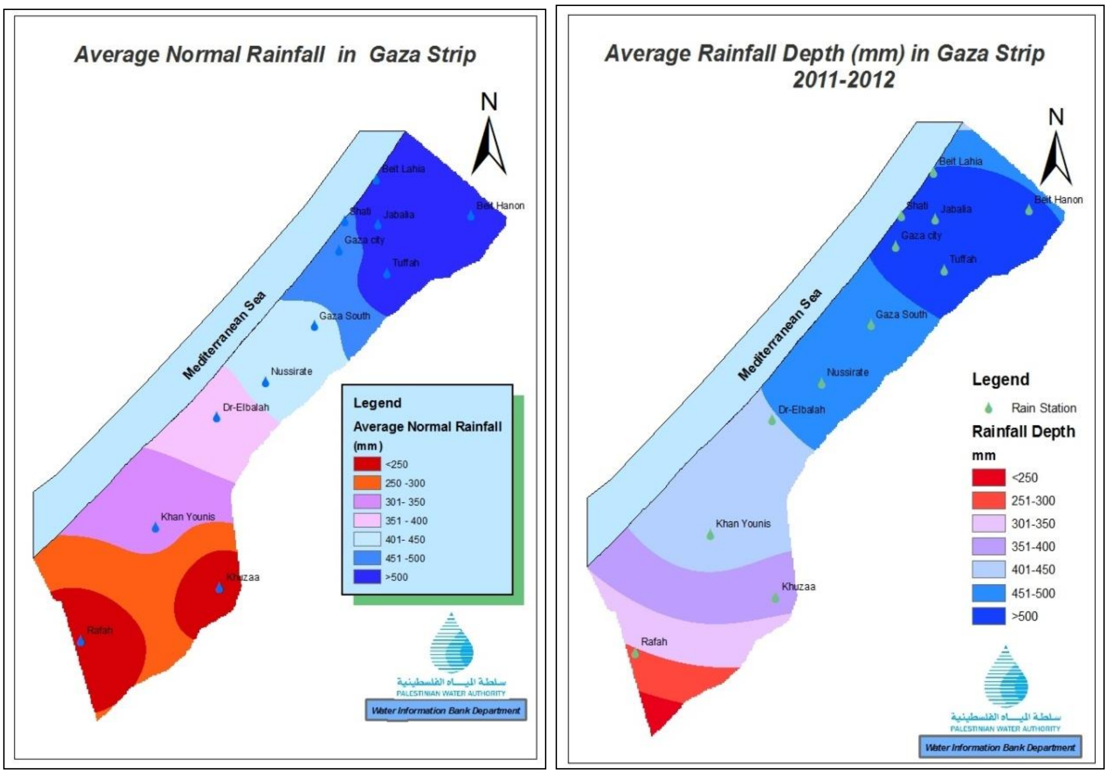

Figure 4: Rainfall contour maps for the West Bank, 2010/2011 season and long term average

Recharge Gaza and West Bank

Based on rainfall figures for the hydrological year 2011/2012, the total water volumes over the West Bank and Gaza Strip were 2926 MCM and 136 MCM, respectively. Using these figures the 2011/2012 recharge for the three West Bank basins was estimated at 721 MCM. This was distributed as follows: about 209 MCM received as a net recharge to the Eastern Basin, about 359 MCM to the Western Basin and about 152 MCM to the North-eastern Basin. Meanwhile, the groundwater recharge in the Gaza coastal aquifer was estimated at 69 MCM comparing to 48 MCM for the season 2010/2011**.** Table 1 shows the recharge estimate for the groundwater aquifers in the West Bank and Gaza Strip.

Table 1: Recharge Estimates

Aquifer-Basin	**Area within West Bank (km^2)**	**Average rainfall (mm) 2011/2012**	**Recharge Volume 2011 /2012 (MCM)**	**Long-term Average Recharge (MCM)**
Western Aquifer	1,767	581	359	318-430
North-eastern Aquifer	981	517	152	135-187
Eastern Aquifer	2,896	483	210	125-197
West Bank Total	5,644	519	721	578-814
Gaza Coastal Aquifer	365	372	64	55-60
Palestine Total	6,009		785	633-874

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2.2 Surface Water Resources

Surface water resources are represented mainly by the Jordan River and ephemeral wadis flowing towards three basic directions: towards the Mediterranean (West Bank and Gaza Strip), towards the Jordan Valley and towards the Dead Sea.

The Jordan River

The Jordan River is one of the main rivers in the region, and the only permanent river in the West Bank and in the whole of the oPS. It flows north to south from an altitude of 2200 meters above sea level to end at the Dead Sea at an altitude of ±425 meters below sea level. The Jordan River is shared among five riparian countries: Palestine, Jordan, Syria, Lebanon and Israel, with the latter using most of the water.

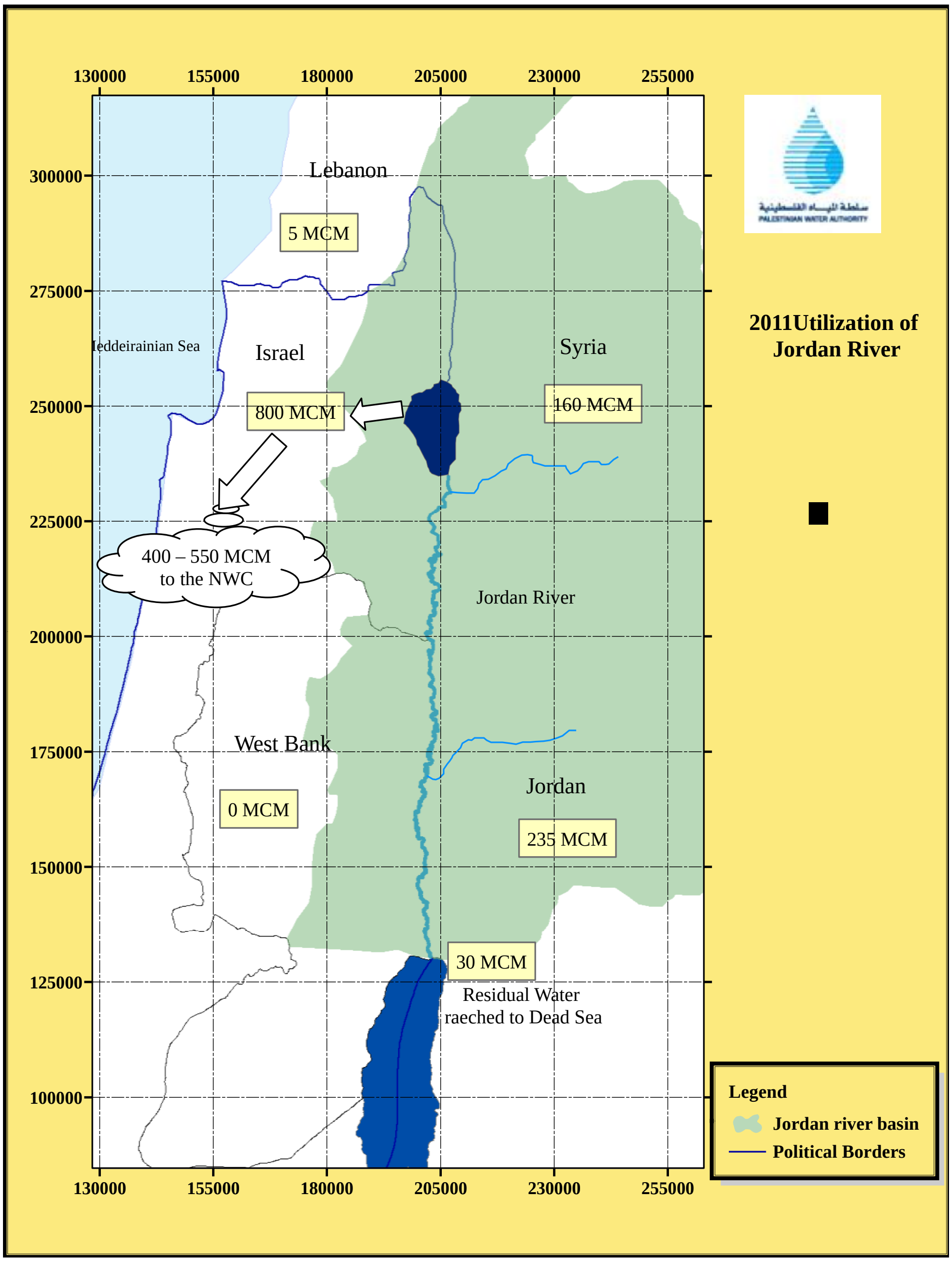

Figure 5: Current utilization of Jordan River water

The Jordan River flows into Lake Tiberias, and continues south to join with the Yarmouk River at the Yarmouk Triangle. It then flows south to end at the Dead Sea. Historically, the quantity of water flowing into the Lower Jordan River and discharging into the Dead Sea was an estimated 1400 MCM/y. This amount decreased dramatically during the past six decades and is presently no more than 30 MCM/y (FOEME-2010). This huge reduction in flow is due mainly to diverting by Israel of more than 500 million cubic meters through the National Israel Water Carrier, as far south as the Negev, in addition to the construction of many dams on the upper reaches of the river. Moreover, natural factors such as evaporation also had an adverse impact on Jordan River flows. Furthermore, the Jordan River is threatened by the discharge of large quantities of untreated wastewater from Israeli settlements located along the south of Lake Tiberias. Figure 5 shows the current utilization of the Jordan River by riparian countries.

Wadis

Surface water flowing into wadis during the rainy season forms an important potential source of water. The long-term average annual flow of flood water through wadis in the West Bank is estimated at about 165 MCM/y. During the 2011/2012 season the average reached 179 MCM/y. The West Bank wadis are classified into eastern (toward the Jordan Valley and towards the Dead Sea) and western (towards the Mediterranean) by the direction of flow as shown in Figure 6. 33 major West Bank surface catchments are recognized; Table 2 lists the annual average flow.

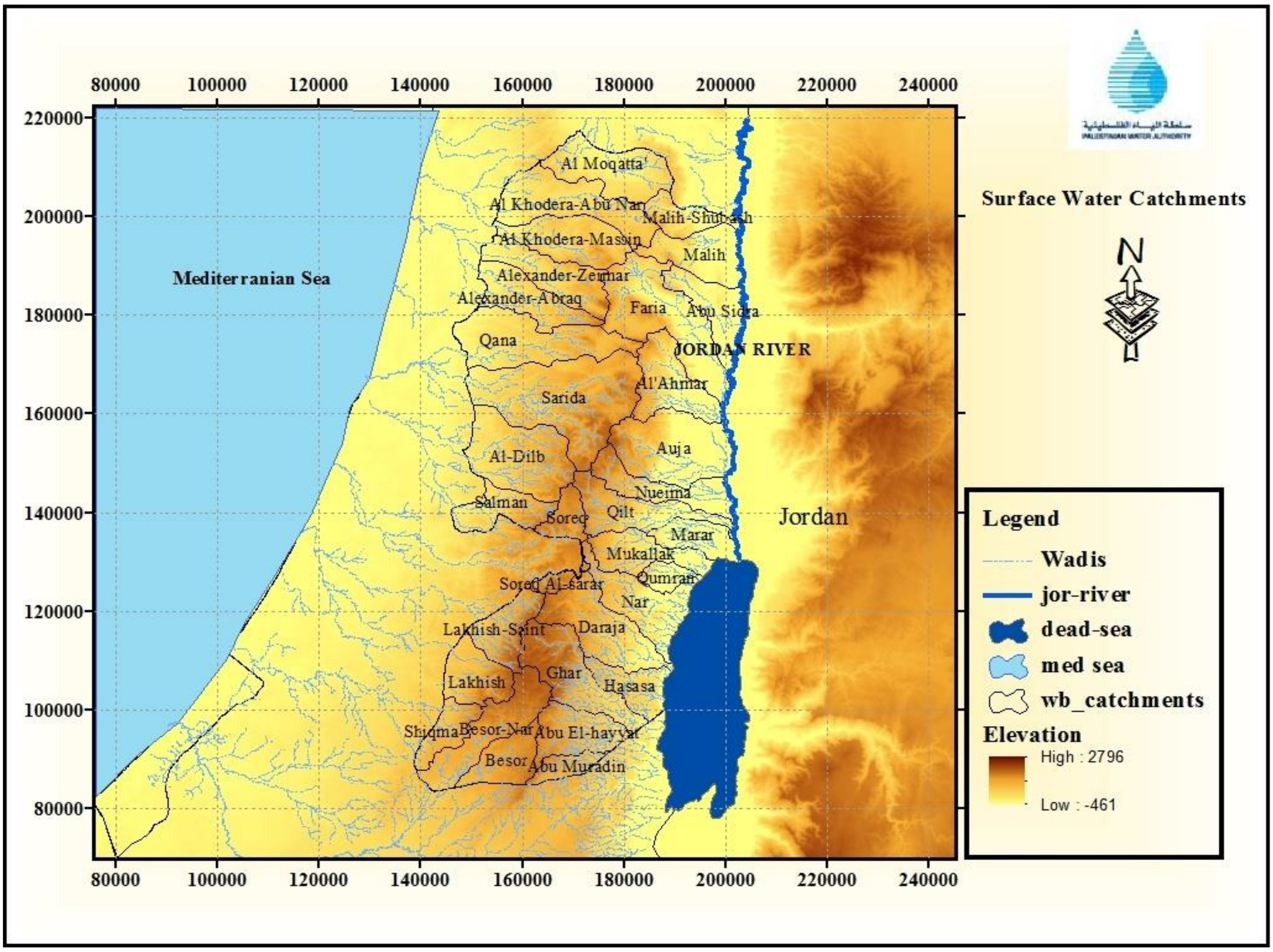

Figure 6: Surface water catchments and wadis

Table 2: Estimated discharge West Bank wadis, 2011/2012 season

No.	Flow Direction	Catchment	Average Runoff (MCM)	2012 Estimated Runoff (MCM)
1	Western Wadis Flowing towards Mediterranean Sea	Al Moqatta'a	3.60	3.70
2		Al Khodeira-Abu Nar	8.30	8.35
3		Al Khodeira-Massin	11.70	11.00
4		Alexander- Zeimar	8.70	8.30
5		Alexander-Abraq	8.10	7.74
6		Qana	12.80	11.94
7		Sarida	22.80	23.50
8		Al-Dilb	16.40	17.29
9		Salman	6.50	7.00
10		Soreq	2.10	2.12
11		Soreq Al-sarar	1.70	1.80
12		Lakhish-Saint	5.00	5.40
13		Lakhish	5.40	6.20
14		Shiqma	2.60	2.33
15		Besor-Nar	4.90	5.30
16		Besor	2.10	2.80
Total			122.70	124.77
17	Eastern Wadis Flowing towards Jordan River	Malih-Shubash	0.90	0.97
18		Malih	1.20	1.90
19		Abu Sidra	0.80	1.44
20		Faria	6.40	7.24
21		Al'Ahmar	4.35	3.87
22		Auja	4.60	5.54
23		Nueima	1.70	2.53
24		Qilt	4.20	5.88
25		Marar	0.40	0.45
Total			24.55	29.82
26	Eatern Wadis Flowing towards The Dead Sea	Mukallak	3.50	4.20
27		Qumran	0.40	0.28
28		Nar	2.40	2.53
29		Daraja	5.30	6.80
30		Hasasa	0.50	0.85
31		Ghar	6.50	6.67
32		Abu El-hayyat	2.40	2.50
33		Abu Muradin	0.50	0.50
Total			21.50	24.33
Total West Bank Runoff			168.75	178.92

In the Gaza Strip, the major wadis originate east of the border where Israel is blocking the natural flow for irrigation purposes. This makes the wadis dry except in years of heavy rainfall. Because the topography in Gaza is flat and land is scarce, the scope for storing and using any remaining surface water is very limited. In the overview (Table 2) the flow from the Gaza wadis is not included for this reason.

Surface water harvesting of wadis was not taken into account in the National total volume as it is still not much developed, despite significant interest. The required investments are high and in addition the Israeli occupation imposes severe restrictions on dam-construction permits. Table 3 shows the existing storm water harvesting structures in West Bank and the harvested quantities.

Table 3: Summary of existing water harvesting structures

No.	Harvesting method	Location	Use	Potential (m^3)
1	Dam	Al Auja	Agriculture	700,000
2	Cisterns	West Bank	Domestic	4,000,000
3	Agricultural Ponds	Jordan Valley, Marj Ibn A'mer	Agriculture	750,000
4	Dam	Fara'a	Under construction	32,000

2.3 Groundwater Resources

Groundwater is the main source of water for the Palestinians in the West Bank and Gaza Strip, providing more than 90% of fresh water supply for various purposes. The main aquifer systems consist of several deep-seated rock formations from the Lower Cretaceous to the recent age. The spatial and vertical hydrogeological variety of the Mountain Aquifers in the West Bank determines the quantity, quality, and extraction cost of groundwater, which differ greatly within this relatively small area. The system may be divided into four units, three on the West Bank and one in the Gaza Strip. For the descriptions below only the Palestinian parts of the shared aquifers are considered when discussing sustainable yield and abstraction. If Israeli abstraction is mentioned this is within the West Bank. Sustainable yield is comparable but not equal to long term average recharge.

Western Aquifer Basin: This is the largest basin and the most important one among the West Bank Aquifer basins. It has a sustainable yield estimated at 362-400 MCM per year. However, this basin is heavily exploited by the Israelis at variable rates of 340-430 MCM. In some years it reaches more than 520 MCM, while the Palestinians consume only 28MCM through wells in 2012. The main aquifer system in this basin is the upper and lower Cenomanian aquifers.

North-eastern Aquifer Basin: Most of the recharge areas of this basin are located within the West Bank boundaries and it has an annual sustainable yield of 100-145 MCM. Despite this, the Israelis exploit the aquifer at a rate of 103 MCM/Y, most of this quantity taken from springs in Galbou' Area. The Palestinian utilization in 2012 from this basin reached around 23 MCM/y from wells and springs, most of this quantity being taken from the shallow Eocene aquifer. The aquifer system in this basin includes the shallow Eocene Aquifer, Upper and Lower Cenomanian Aquifers.

Eastern Aquifer Basin: The basin is divided into three main sub-aquifers, namely the Mountainous Heights, North-eastern Tip and Jordan Valley. The annual sustainable yield of this basin is estimated at 145-185 MCM. However, the Israelis exploit the aquifer at a rate of 50 MCM/y from wells in addition to 100 MCM/y from Dead Sea Springs that are controlled by Israel; while the Palestinians utilized about 53 MCM/y by wells and springs in 2012.

Table 4 shows the groundwater allocations for both sides according to Oslo agreement and the consumption figures in 2012 from the three shared groundwater aquifers (West Bank area only).

Table 4: Water allocation according to Oslo agreement and utilization in 2012

Use	Oslo Agreement (MCM)				Utilization 2012 (MCM)			
	WAB	NEAB	EAB	Total	WAB	NEAB	EAB	Total
Israel	340	103	40	483	≈411**	≈103**	150*	664
Palestine	22	42	54	118	28	23	53	104
Additional Quantity for Palestinian Development	--	--	78	78	--	--	0	0
Basin Total	362	145	172		439	126	203	

* This includes 100 MCM from Dead Sea springs, which Israel prevents Palestinians from developing
** Since there are no updated figures from Israeli side, the figures of 2011 are used here

It is obvious from Table 4 that, 17 years after the Oslo Agreement came into force, the Palestinians in the West Bank are still utilizing less than 14% of available shared groundwater resources, while the Israelis are utilizing more than 86%.

The Gaza Coastal Aquifer: The Coastal Aquifer is the only source of water in the Gaza Strip, with the thickness of the water bearing strata ranging from several meters in the east and south-east to about 120-150 m in the western regions and along the coast. The aquifer consists mainly of sand and gravel sand and sandstone (Kerkar) intercalated with clay and silt. Hard and non-productive layers of clay and marl with low permeability (Sakia Formation) with a thickness of about 800-1000 m are situated below the coastal aquifer. The yearly recharge volume, equalled to the sustainable yield for this limited volume aquifer, is in the range of 55-60 MCM/yr. The Palestinian utilization from this aquifer in Gaza Strip is about 185 MCM in 2012.

Well Abstractions

The total number of the Palestinian wells in the West Bank tapping all aquifer systems is 383, of which 119 wells are not pumping or abandoned and in need for rehabilitation (Figure). The total annual abstraction from these wells is approximately 64 MCM in year 2012 of which 36 MCM for domestic use and 28 MCM for agricultural use; Table 5 shows the annual average abstraction from Palestinian wells during the period of 2007-2012. The number of Israeli wells inside West Bank is 39, and the average annual abstraction of these wells is estimated at about 54 MCM. Furthermore, Israel uses more than 500 wells inside the Green Line (mainly in the Western Basin), which abstract more than the annual recharge rate of all aquifers. As a result, the Palestinians are inevitably affected due to general decrease of water level in the aquifers, as the total annual abstraction greatly exceeds the recharge rates.

Table 6 summarizes the total abstractions from Palestinian wells per use and per aquifer, respectively. In Gaza, the total abstracted volume in 2012 for municipal/domestic use was about 102 MCM; for agricultural use it was about 83 MCM so the total volume was about 185 MCM[2]. This means that the total recharge is only one third of total abstractions, and as a result 95% of this water does not match

[2] In addition 4MCM was purchased from Mekorot, Israel, for domestic use.

WHO standards. Consequently, the cumulative water deficit is still increasing even when there was a remarkable increase in the amount of rainfall received in the season of 2011-2012 compared with previous years.

Table 5: Summary of total abstraction from Palestinian wells per use

Basin	**Palestinian Abstractions (MCM) in 2012**		
	Domestic	**Agriculture**	**Total**
Western Basin	12.3	18.1	30.4
Eastern Basin	11.0	9.9	20.9
North-eastern Basin	10.0	3.0	13.0
Total West Bank	33.3	31.0	64.3
Gaza Coastal Aquifer	102	83	185

Table 6: Summary of 2012 Palestinian well abstractions per aquifer, West Bank

Basin	Aquifer	Type	Abstractions (MCM)
Eastern	Alluvium	Shallow	6.0
	Beida	Shallow	1.1
	Eocene	Shallow	1.0
	Upper Cenomanian	Upper Aquifer	2.0
	Lower Cenomanian	Lower Aquifer	10.8
Total Eastern Basin			**20.9**
Western	Upper Cenomanian	Upper Aquifer	29.0
	Lower Cenomanian	Lower Aquifer	1.4
Total Western Basin			**30.4**
North-eastern	Beida	Shallow	0.3
	Eocene	Shallow	1.4
	Upper Cenomanian	Upper Aquifer	5.5
	Lower Cenomanian	Lower Aquifer	5.8
Total North-eastern Basin			**13.0**

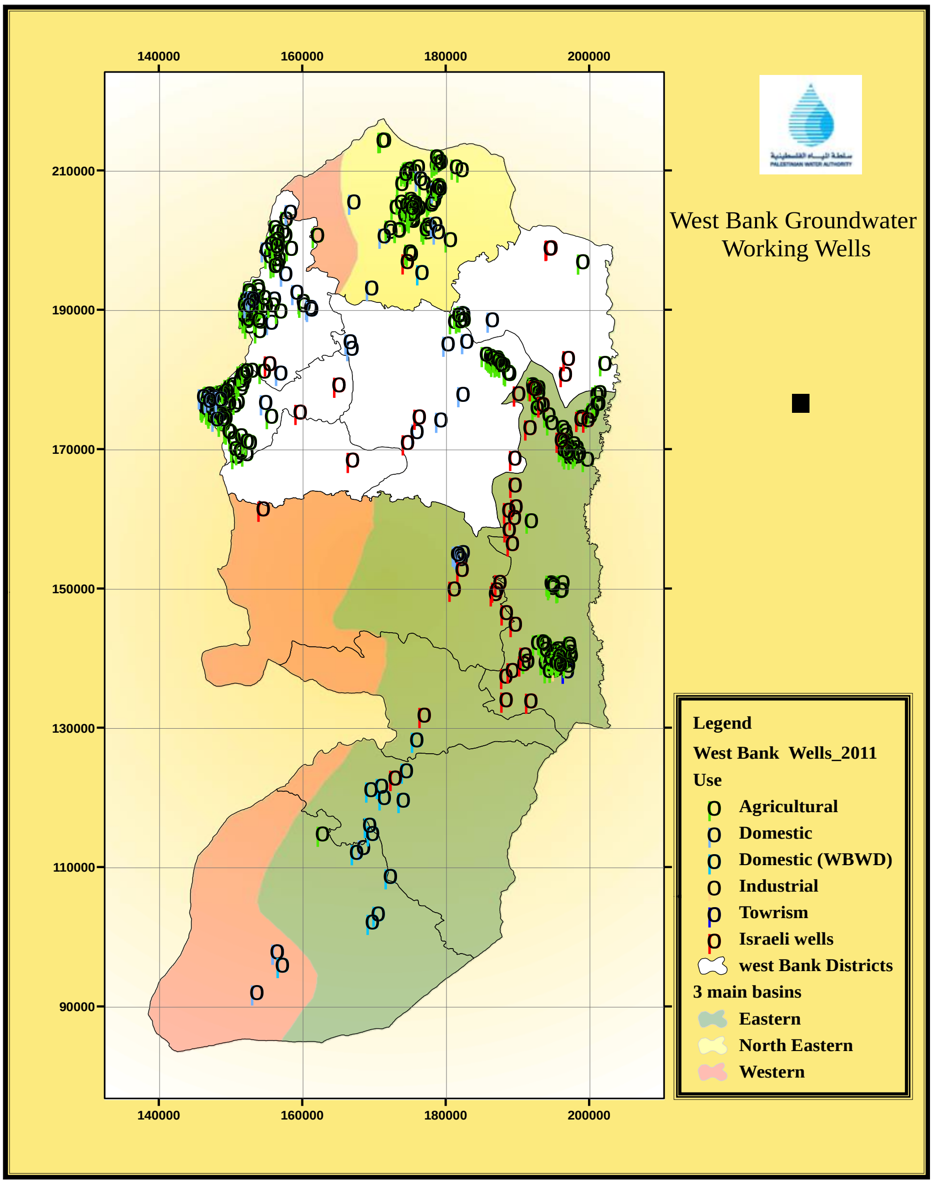

Figure 7: Location of wells in the West Bank

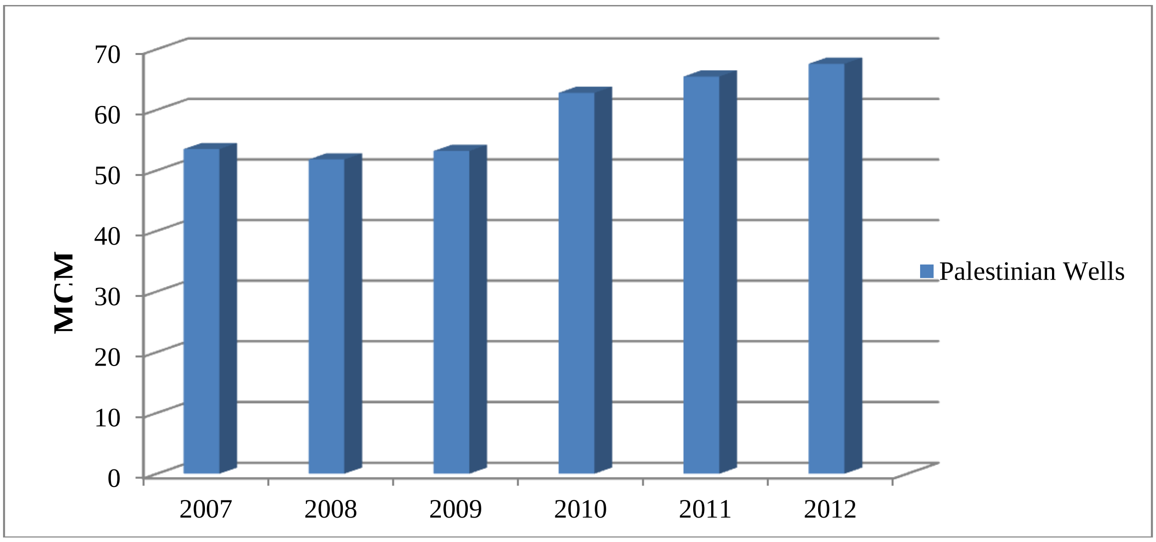

Figure 8: Average annual abstractions from all Palestinian Wells in West Bank Aquifers

Springs Discharge

In addition to well abstraction, there are many springs that discharge water from the three groundwater system of the West Bank. There are about 300 main springs emerging from different aquifers in the Eastern Basin and North-eastern Basin; most of them are small springs with an average discharge of less than 0.1 litre/second. The long-term annual discharge of these springs is around 54 MCM. In 2012, the overall yearly discharge has increased to about 39 MCM comparing to 21 MCM in year 2011. This significant increase can be attributed to the relative increase of rainfall in the 2011-2012 season, though it is still much lower than the long-term average annual discharge, see Figure 6.

The springs in the Eastern Aquifer Basin are divided into two groups:

1 - Jordan River Basin Springs: A group of 42 main springs that run towards the east to the Jordan River Basin through the eastern wadis of the West Bank. Their long term annual discharge is about 33 MCM. The most important springs of this group are: Bardala, Far'a, Fasail, Diouk, Nou'meh Ein Sultan and Qilt.

2 – Dead Sea Basin Springs: A group of about 21 main springs located directly near the north western areas of the Dead Sea inside the West Bank. Their long term annual discharge reaches about 110 MCM; however, the water of these springs is brackish. The most important springs of this group are: Fashkha springs and Ein Gedi.

There are 36 main springs in the North-eastern Basin with long-term annual discharge of 14 MCM. Generally, variation of spring discharge from one year to another depends mainly on rainfall quantities and pumping from the aquifer.

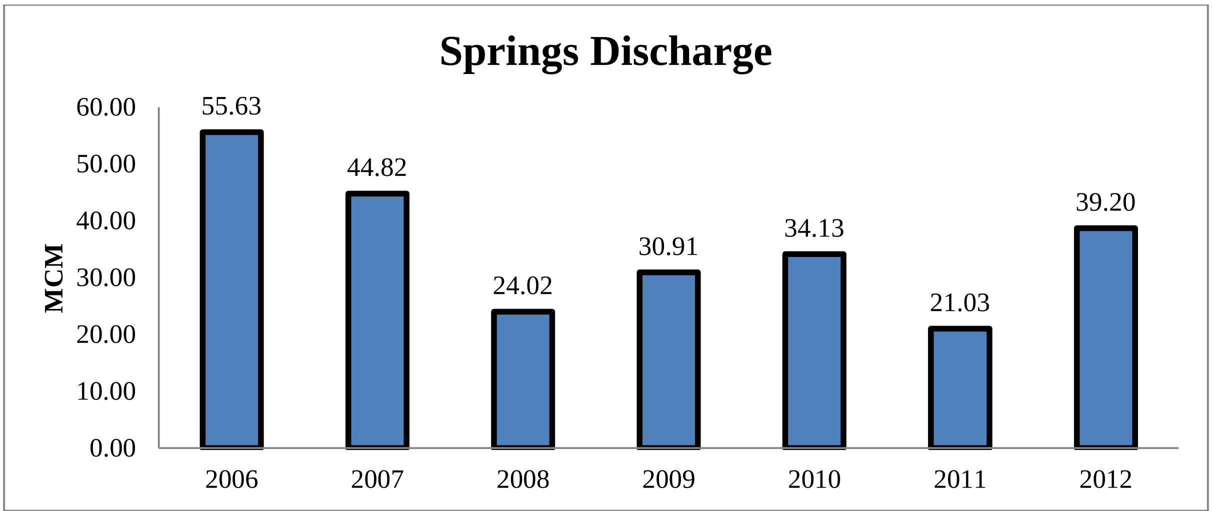

Figure 6: Annual average spring discharge in the West Bank

Groundwater Level Fluctuation

During the past years, a clear decline in groundwater levels was observed at many production wells in the West Bank and the Gaza Strip. Declines occurred mainly in the southern parts of the West Bank as a result of the recent drought and intensive pumping from the nearby Israeli wells. The decline in water level varies from well to well depending on well location, hydrogeological properties and pumping regimes. Generally, water decline varied from just a few meters in the north to more than 25 meters in the south over the past 4 years. Figure 7 represents the interpolated annual average water elevation in a selected well in the Eastern Basin.

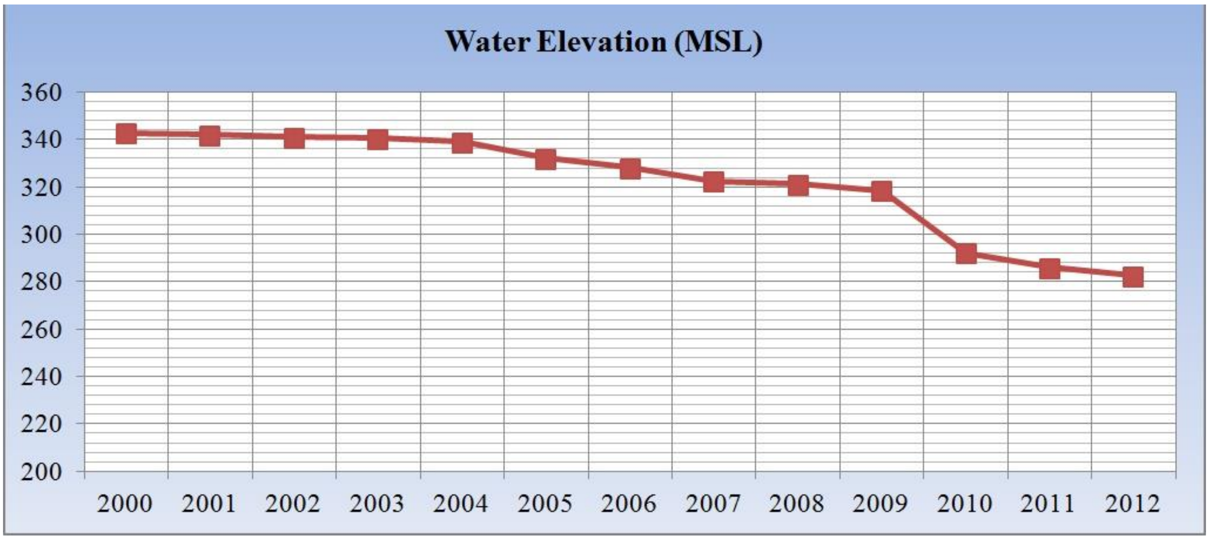

Figure 7: Annual average water level in E. Herodian well

During the 2011/2012 season a further groundwater level decline was observed in many groundwater wells in the Gaza, as expected result of intensive abstraction quantities (185 MCM/y), much higher than the recharge amount (64 MCM in 2011/2012) of the coastal aquifer. The most serious declines have been observed in the southern part of Gaza Strip (Rafah) where the level dropped to about 18m below sea level and in the northern part (Jabaliya) at about 8m below sea level (see Figure 8). The reason behind the difference in water level decline is mainly the potential of the water bearing layer in terms of recharge and its thickness, which is generally higher in the north compared to the south.

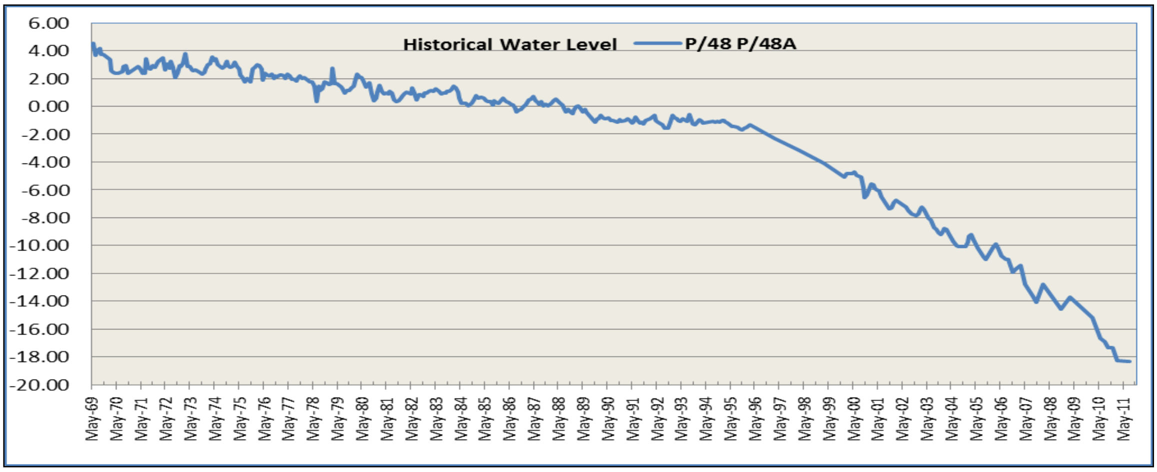

Figure 8: Representative water level decline in well in Gaza

Water Quality

As a general overview on water quality status in West Bank aquifers, a partial analysis including only chloride and nitrate content is presented, using 2013 data. Furthermore, and in order to evaluate the groundwater quality in 2012, data from selected representative wells in the Jordan Valley, Qalqilya and Tulkarem were selected. In the Jordan Valley area most of the wells show a high concentration of chloride exceeding 250 mg/l, while showing a relatively low nitrate concentration (Figure 9). In the

Tulkarem and Qalqilia areas the nitrate concentration in some wells exceeds 50 mg/l while the chloride concentration in these wells stayed within the acceptable limit (Figure 10).

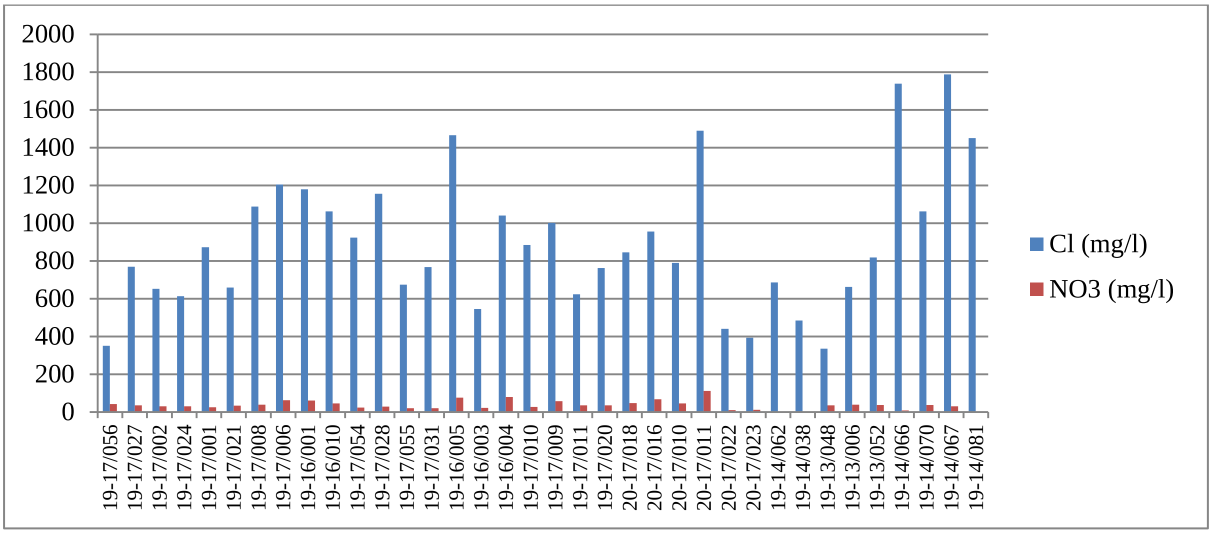

Figure 9: Annual average chloride and nitrate content in selected wells in the Jordan Valley

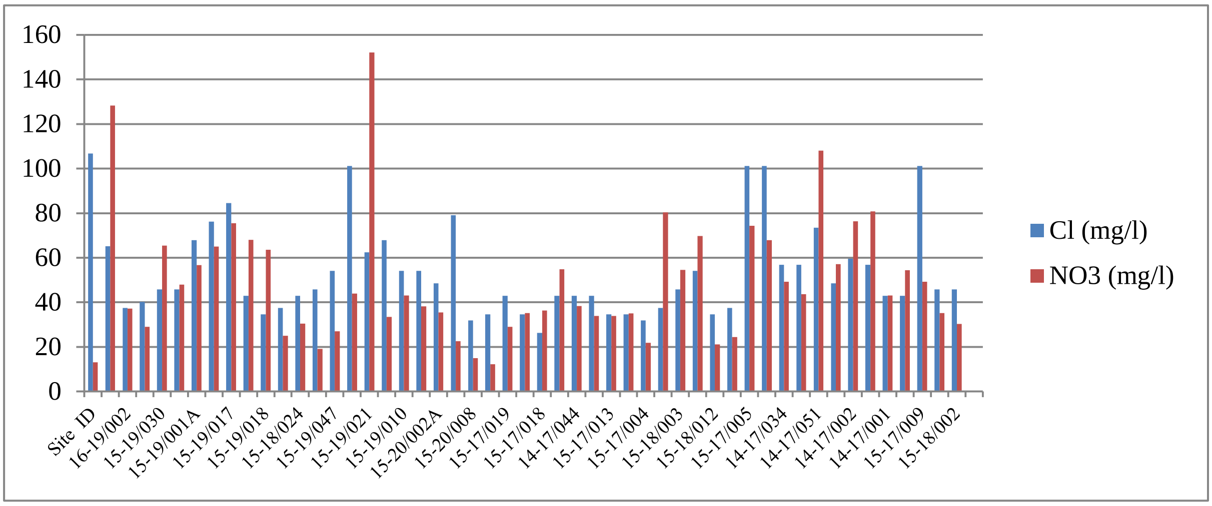

Figure 10: Annual average chloride and nitrate content in selected wells in Qalqilia and Tulkarem

In Gaza, the direct consequences of over pumping of the coastal aquifer are seawater intrusion and uplift of the deep brine water; as a result the water quality falls well short of accepted international guidelines for potable water resources. The groundwater salinity has been increased significantly during the year 2012 in most of the water wells. The magnitude as well as the attitude of that increase varied from well to well as well as from area to area, depending on hydrogeological factors. In addition to this, Gaza is experiencing serious wastewater-driven problems, characterized by high levels of nitrates in the groundwater. The chloride concentration of the pumped water is in the range of 100-2400 mg/l, resulting in less than 5% of the delivered domestic water matching prevailing drinking water standards, (Figure 11). It has been noticed also that some wells are characterized by stable salinity since these wells are relatively shallow in depth and located in an areas of high saturated thickness.

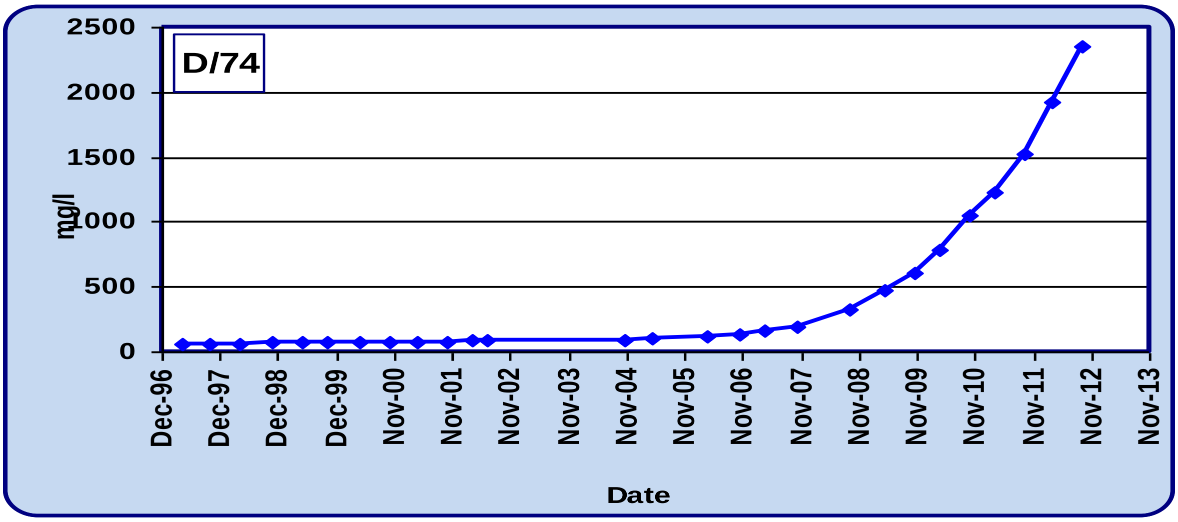

Figure 11: Representative chloride trend graph for the Gaza Strip

3 Non-conventional Water Resources

3.1 Treated wastewater re-use

While there are a lot of ongoing waste water projects including the construction of treatment plants, the only one completed at this moment is the Al Bireh plant. The treated effluent of the Al Bireh plant is not yet reused, but there are efforts to transfer its effluent to the Al-Auja area to be used for palm trees and other crops. In addition, on a small scale about 800 grey water treatment plants at household level are currently working locally, with a total annual effluent of about 0.5MCM/y.

In the Gaza Strip there was no significant improvement in the treated wastewater reuse situation in 2012. There are scattered wastewater reuse pilot projects for agriculture with a total reuse capacity of not more than 1.0 MCM/y. Regarding recharge, infiltrating a total of 7-8 MCM of partially treated wastewater in the northern area of Gaza Strip continued, through the ENGEST project. In addition two pilot projects for harvesting and infiltration of storm rainwater in two selected location in Gaza City (street) and Deir El Balah (house roof) were implemented for environmental protection purposes.

3.2 Desalinated Water

Desalination of brackish water to achieve acceptable levels of drinking water quality is an important option that is implemented in the West Bank on a limited scale; small scale units are operational in scattered locations in the Jordan Valley, mostly as pilot projects. In Gaza it is presently implemented at local scale only. No significant progress has taken place during 2012 on the desalination of sea water in the Gaza Strip, although it is a key requirement in water resources management and very urgent. The most important accomplishment is the start of the expansion of the existing Deir El Balah seawater treatment plant from a capacity of 0.22 MCM/y to 0.95 MCM/y (2600 m^3/day). In addition the required feasibility studies (EIA and geotechnical testing and preliminary design) continued for the EU funded Short Term Low Volume (STLV) seawater desalination plant. This plant is to be constructed in the southern part of Gaza Strip, with a capacity of 6000 m^3/day (2.2 MCM/y) and will be serving parts of Khan Younis and Rafah.

A regional seawater desalination plant with a capacity of 55 MCM/y is planned to be built in the central area of the Gaza Strip; in 2012 the required feasibility studies by the EDB were under preparation and they are expected to be completed in 2014. Meanwhile there have been unremitting efforts by the PWA to ensure the provision of necessary funds for construction of the desalination plant as well as the regional water carrier.

The brackish groundwater is also used as feedstock for small scale desalination plants. There are 117 RO (reverse osmosis) desalination plants spread all over the Gaza Strip, using existing groundwater wells. The plants are owned and operated by the private sector, water vendors, who distribute this water for drinking/cooking purpose using a network of tankers and water shops. The total abstracted quantity of groundwater from those wells is estimated at 4.8 MCM/y while the total produced desalinated quantity is estimated at 2.8 MCM/y.

3.3 Purchased water (Mekorot)

In 2012, the total quantity purchased and available to Palestinian communities was about 57 MCM, of which 53 MCM for the West Bank and 4 MCM for the Gaza Strip. This was about 30% of all municipal water supply available to Palestinians (60% on the West Bank and 4% in the Gaza Strip). Of the 157 MCM available for Palestinians[3] on the West Bank about 34% came from import of water from the Mekorot systems; such imports accounted for 60% of municipal water supply.

These imports compensate to some extent the constraints imposed by the Israeli occupation on the construction of new Palestinian wells and on rehabilitation of existing wells; they have been increasing during the recent years.

[3] All water, for domestic/municipal and agriculture use, including springs