
Hydropolitics in recent Israeli-Palestinian relations

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INTRODUCTION

The word 'hydropolitics' appears in the title of a book by John Waterbury (1979) in which he describes the tensions characterising competing interests in the use of the River Nile. M. R. Lowi, one of Waterbury's students, uses the word in her doctoral dissertation with reference to scarcity and conflict over the River Jordan's water (Lowi, 1990; 1994). Postel (1992) has a chapter headed "Hydropolitics" in which she details the escalating tensions over water in a new world order after the Cold War and after the 1992 Earth Summit. She suggested that water had become a strategic resource as likely to lead to warfare as oil did in 1991. In her view, there is a need for a new water ethic not only as an ecological necessity, but also essential for national security and for peace in a world of finite resources (Postel, 1992:p73). The word 'hydropolitics' is used by Maury (1994:p.123) to describe, in terms of political imagery and symbolic relations, the tensions characterising competing water interests. Trottier (1999) employs a similar usage in her doctoral thesis dealing specifically with the tensions of water politics in the West Bank and Gaza. The word appears in the subtitle of Allan (2001), a wider study of water issues in the Middle East–North Africa (MENA) region. It is in this more general sense that the word is used in this paper, with particular reference to the hydropolitical relations that characterised Israeli–Palestinian negotiations. The control of water allocation is seen as a strategic as well as an economic commodity by these conflicting nations. A vitally important concern, particularly for the Palestinians, is the relationship between water security and socio-economic development.

The signing of the Bilateral Interim Accords in Washington in 1995 (popularly known as Oslo 2) was an attempt to resolve the Israeli-Palestinian conflict. Article 40 of this document deals with water supply and wastewater removal and treatment. The provision of water in sufficient quantity and appropriate quality, as well as the management of that provision, is one of the most sensitive political items on the agenda of Israeli–Palestinian negotiations.

In the West Bank, the political context has been the prime

force governing water use and allocation and therefore the patterns of degradation and depletion of groundwater resources (Gass *et al.* [undated]). Article 40 and its Appendices allocate water amounts between Israelis and Palestinians. Palestinian negotiators managed to get a clear acknowledgement that they had rights to water in the opening paragraph of Article 40. The exercise of those rights, in terms of developing a coherent policy, was extremely limited. However, it did allow the Palestinian Water Authority (PWA) to accept foreign grants for drilling and improving the water infrastructure. This paper is principally concerned with the drilling programme in the southern West Bank.

Here the Eastern Aquifer was designated in Article 40 as the principal source of fresh water for the Palestinian population.

DEVELOPMENTS IN THE SOUTH-EASTERN BASINS OF THE MOUNTAIN AQUIFER (1963–1995)

It is important to place the water negotiations of the 1990s in the context of the previous 30 years' exploitation of the West Bank aquifers. The West Bank was incorporated into the Hashemite Kingdom of Jordan in 1950. In 1963 the British consultancy firm of Rofe and Raffety completed its hydro-geological survey of the southern West Bank, identifying the aquifer potential of the unconfined eastern basin of the Mountain Aquifer between Bethlehem and Hebron. In 1963 Beit Fajjar 1 well was drilled (Figure 1) and supplied domestic water at a rate of 1200 m³ day⁻¹ for the districts of Hebron, Bethlehem and parts of East Jerusalem. Future increase in extraction rates were calculated to keep pace with projected demographic rates up to the 1990s (Abed Rabbo *et al.*, 1998).

These projections became obsolete following the 1967 Arab–Israeli war and the beginning of Israeli occupation of the West Bank. The Israeli Army took control of water resources and the Palestinian water authorities were no longer able to develop the water well fields established under Jordanian rule. The Israeli company, Mekorot, developed the

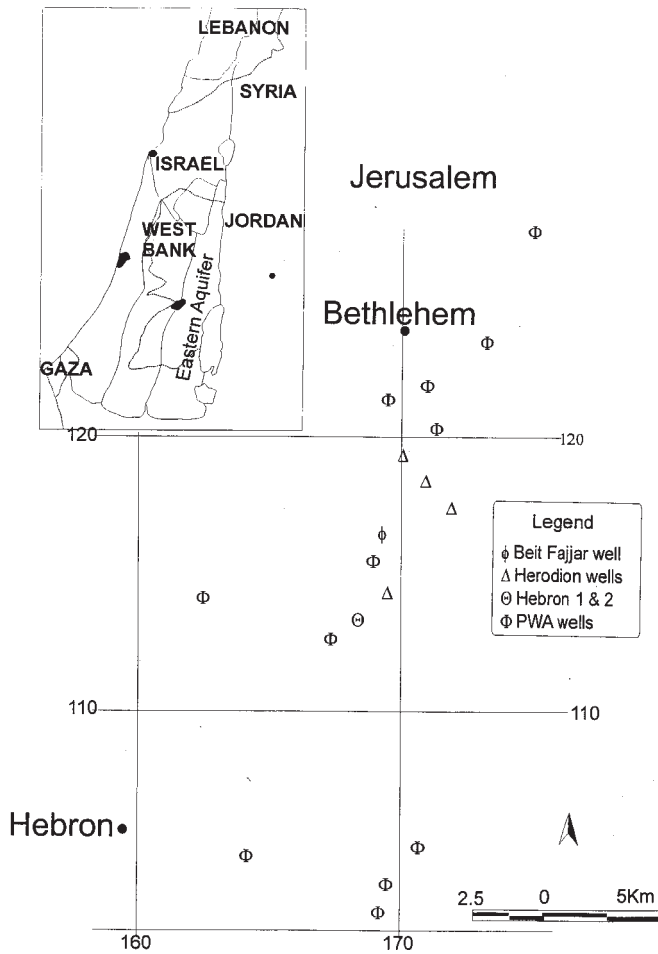


Fig. 1 Location map showing production wells in the south-eastern aquifers.

area surveyed in the early 1960s, drilling Beit Fajjar 2 and 3 on the site of the original Beit Fajjar well to a total depth of 307 m in 1988 Five more wells, constituting the Herodion series, were drilled between 1971 and 1993 (Table 1, Figure 1).

The water extracted from these wells was intended primarily for the rapidly growing Israeli settlements in the West Bank. However, an allocation of water from these West Bank aquifers that favoured Israelis at the expense of the local Palestinians would not in the long run provide stable and satisfactory answers to the questions of efficiency, legality or equity that must be pursued in the peace negotiations. It is within this context that water, as a fundamental political issue, touching on sovereignty, human rights and the interpretation of International Law, entered the arena of the Israeli-Palestinian peace negotiations

PEACE NEGOTIATIONS AND THE SOUTH-EASTERN AQUIFERS OF THE WEST BANK (1995-2003)

The Palestinians came to the negotiating table during the 1990s with expectations of being able to provide their constituents with a considerable increase in water supply. Article 40, together with its appendices from the Oslo 2 document, was the principal protocol for implementing allocation during the interim period of Israeli-Palestinian negotiation.

It was hoped that Israel's conformity with international law would allow the Palestinians to regain control of their most basic resource, the water contained within the West Bank aquifers. Application of the principles of *sovereignty* and *prior use* in international law, particularly in the Israeli-Palestinian conflict are ambiguous. Israel is a sovereign state but the cease-fire lines drawn between disputed Jewish and Arab territories at the end of the 1948 war did not establish internationally recognised boundaries between sovereign states. At the time of the 1967 war, the West Bank was under Jordan jurisdiction. In 1988, before the peace process began, Jordan relinquished its control of this Palestinian area. The expectation was of a two-state solution, in which the West Bank would be part of a sovereign state of Palestine alongside the State of Israel.

It was not clear whether Jordan's prior use of the West Bank

Table 1. The wells of the Herodion water well field (1971-1993)

| Well | Coords | Elevation Depth | Total | Aquifer (mbgl) | SWL $m^3 hr^{-1}$ | Yield* ($10^6 m^3$) | Pumpage |
|-------------|--------------|--------------------|-------|-------------------|----------------------|--------------------------|---------|
| Beit Fajjar | 16960/ 11510 | 728.00 | 305 | Upper | 159.18 | 230 | 1.72 |
| Herodion 1 | 17092/11833 | 569.47 | 350 | Upper | 222 | 120 | 0.95 |
| Herodion 2 | 17090/11933 | 562.99 | 770 | Lower | 257.7 | 336 | 2.80 |
| Herodion 3 | 17085/11722 | 616.78 | 800 | Lower | 305.35 | 400 | 3.43 |
| Herodion 4 | 16946/11408 | 684.50 | 691 | Lower | 326.4 | 249 | 1.82 |
| Herodion 5 | 16946/ 11412 | 680.00 | 350 | Upper | n/a | 78 | 0.61 |

Source: CDM/Morganti (1997)

mbgl = metres below ground level

*pump-test rate, not sustainable yield or production rate

aquifers was cancelled by that state's relinquishing of its territorial claim or that such prior use could be transferred to the Palestinian National Authority (PNA), which might eventually have sovereign status. How valid was Israel's claim that the West Bank was part of Israel? How binding were the United Nations resolutions demanding Israel's withdrawal from the territories won in the Six Day War? The Palestinian negotiating position was weak, even though Palestinians had a strong moral/ethical claim to West Bank aquifers, which seemed to be supported by the Fourth Geneva Conventions. Israel, not a signatory to these conventions, dismissed such a claim. The unsatisfactory division of Mandated Palestine into a Jewish/Arab demographic patchwork quilt in 1947 led to war. Could a just division lead to peace more than half a century later?

An important aspect of state building for the West Bank was to regain control of or at least have shared management of the aquifers under its territory. Israeli, Palestinian and other professional and academic scientists worked hard on ways to resolve satisfactorily the shared management of the aquifers (Feitelson and Haddad, 1998a, 1998b, 2001; Haddad *et al.*, 1999). Even more important for the viability of the putative state was access to livelihoods and the ability to develop an economy that would allow food security. The restrictions on travel and trade imposed by the Israeli Army of occupation (IDF) as well as the enormous destruction ensuing from military incursions into Palestinian areas radically reduced water, food and economic security. Although water security is closely related to socio-economic development and this in turn is associated with access to livelihoods, there is no necessary linkage between access to local water supplies and food security. Food security depends much more on access to trade that would allow importation of food. However, Palestinian politicians were more anxious to negotiate water allocation as a realisable goal. It soon became apparent that there were serious problems regarding the sustainability of the West Bank aquifers.

Extraction rates from the eastern basins of the aquifer, almost all of which lie under the West Bank, were excessive even before the mid-1990s (Guttman 1998, Aliewi and Jarrar, 2000). Provisions set out in Article 40 allowing the drilling of more wells into an already depleted aquifer exacerbated the problem of unsustainability. The PWA was placed in the almost impossible position of having to relieve the water stress suffered by its constituents and at the same time allow for sustainable exploitation of the West Bank aquifers. The record rainfall of the 1991–92 season, with double the average recharge of the aquifers, shaped the strategic Israeli extraction-rate policy. The rapid response of the aquifers to the record recharge event allowed comparable extraction rates as well as establishing Israeli prior-use demand rates to bring to the

negotiating table. However, for the remainder of the decade, recharge rates were very considerably below average (Scarpa *et al.*, 2002).

The assumption brought to the negotiating table was that only the eastern aquifer had capacity for further exploitation (Guttman, 1998). Maximum yield was estimated at 172 million m³ yr⁻¹. Israel claimed that there was an additional 78 million m³ yr⁻¹ that could be exploited to satisfy Palestinian needs. Several hydrologists and engineers doubted that this additional 78 million m³ was available (Aliewi and Jarrar, 2000; De Bruijn *et al.*, 2000). Aliewi and Jarrar (2000) suggest that the planned additional exploitation could damage the aquifer. Some engineers considered that the aquifer could yield only an additional 20–30 million m³ yr⁻¹ — far less than the needs of the Palestinian population of the West Bank. However, funding agencies accepted the figure of 78 million m³ published in Article 40 of Oslo 2 (De Bruijne, *et al.*, 2000).

Further exploitation of the Eastern Aquifer to provide so-called 'new water' refers particularly to the southern West Bank. Figure 1 shows the production wells that were drilled in compliance with this directive. The sites for 27 boreholes, including 16 production wells and 11 exploration wells, were agreed upon shortly after the signing of the accords (Herrman, Personal Communication, 01.11.02). Claims made by the PWA and engineers contracted by them that most of the sites that they selected were rejected seem irrelevant if the sites had already been selected by scientists working for the principal funding agency, the United States Agency for International Development (USAID) and agreed upon by the State of Israel. However, this procedure does not seem to be in the spirit of the Accords, where emphasis is placed on mutual co-operation and agreement between Israel and the PNA.

Oslo 2 gave a semblance of providing potential control of water resources to the PNA and of correcting the injustices consequent upon Israeli military orders dealing with water allocation since the beginning of the Israeli occupation. Article 40 attempted to define ways that Palestinians could increase the amount of water allocated to them, though without changing Israeli consumption or demand (paragraph 3a and Schedule 10). Injustices were, therefore, likely to continue into the foreseeable future. Schedule 5: 2b states that, "Existing water and sewage systems serving Israelis, shall continue to be operated and maintained by the Israeli side only" even when this clearly refers to Israeli settlements in the West Bank. There was no acknowledgement that the excessive allocation to the Israeli settlement population and consequent deprivation of essential water supplies to the indigenous Palestinian population was contrary to the Geneva Conventions. In fact, the Accords give tacit approval to these settlements, with no diminution of per capita water supply. Israeli settlers in the

West Bank were supplied with about 800 m³ per capita yr⁻¹ while Palestinians received only 82 m³ per capita yr⁻¹ (Scarpa, 2002 and 2003).

Article 40 concerns itself exclusively with quantities of water available to Palestinians and Israelis. Both sides agreed that 70–80 million m³ would satisfy future needs of the Palestinians in the West Bank (Article 40: 6. p.52). The agreement called for the development of 23.6 million m³ of the allotted 28.6 million m³ of extra water for domestic use by the Palestinian population from the aquifers under the West Bank. The document lists the totals that made up the 172 million m³ claimed as the existing potential annual extraction rate for the Eastern Aquifer to be divided between Israeli users in the Jordan Valley, who would receive 40 million m³ and Palestinians who would get 54 million m³ from existing wells and springs in the West Bank. Included was the doubtful further 78 million m³ from future development of the Eastern Aquifer (Schedule 10, Article 40:73).

To help implement the provision allowed for in Article 40, USAID commissioned extensive studies on water development in the West Bank and contracted a consortium of firms (CDM/Morganti and CH2MHILL) to provide the necessary data, planning, design, training, institutional support, provision of commodities and construction services for the Hebron and Bethlehem districts. This was all accomplished with the close collaboration of the PWA. Recommendations were made for future production wells in the eastern basin of the Mountain

Aquifer to provide the 51.4 million m³ yr⁻¹ as stipulated in Schedule 7.b (6) of Article 40 (CDM/Morganti, 1997).

Two new wells, Hebron 1 and 2, were drilled by the Israeli water company, Mekorot, in the southern part of the well field, providing domestic water supply for the Palestinian population of Hebron. Drilling was completed in 1996 and these two wells became operational in 1999–2000. The PWA contracted the Jordan International Drilling and Exploration Company to complete the sixteen production wells in this part of the aquifer for the local Palestinian population by the end of 2001 (Table 2 and Figure 1). However, at the end of October 2002, only two of the new wells were actually pumping water into the supply grid (personal communication, Engineer Mohammad Al-Wahsh, Contractor's Representative, 30/10/02).

In 1998, a major investment scheme for water resource development in the West Bank of about \$300 million was agreed between the PNA and a group of international lenders, consisting of the World Bank, the European Investment Bank (EIB), USAID and some smaller contributors. One of the most severe critics of the funding agents was the Dutch civil engineer, Gurt De Bruijne, an active member of two local NGOs concerned with water and sewage issues. He noted that the drilling project lacked environmental impact assessment and he expressed anxiety over the economic ramifications of the lack of a clear understanding of the issues surrounding the privatisation of the utilities and the setting of tariffs (De Bruijne, *et al.*, 2000).

Table 2. The south-eastern Mountain Aquifer; Production and Monitoring* wells

| Well | Coords. | Elev. | Total depth | Subaquifer | SWL (mbgl) | Yield* (m ³ hr ⁻¹) | Pumpage (10 ⁶ m ³) |
|-------------------------|--------------|-------|-------------|------------|------------|---|---|
| Hebron 1 | 16835/11310 | 710 | 705 | Lower | 320 | 300 | |
| Hebron 2 | 16835/11310 | 710 | 387 | Upper | 103 | 100 | |
| PWA 3 | 17125/12025 | 610 | 741 | Lower | 329.15 | 250 | 1.8 |
| PWA 11 | 16919/11630 | 752 | 851 | Lower | 435 | 275 | 1.8 |
| Hundazza | 16939/ 12140 | 627 | 627 | Lower | 262 | 285 | 2.0 |
| PWA 1 | 16740/11238 | 747 | 601 | Lower | 294.65 | 250 | 1.8 |
| JWC4 | 17081/12196 | 584 | 787.5 | Lower | 322.06 | 250 | |
| Azzariya 1 | 17431/12410 | 529 | 996 | Lower | 344.90 | 250 | |
| ¹ Azzariya 2 | 17378/11988 | 591 | 793 | Lower | 385.30 | 250 | |
| Azzariya 3 | 17574/12866 | 455 | 835 | Lower | 426.82 | 250 | |
| Bani Naim 1* | 16922/10096 | 576 | 795 | Lower | 164 | 250 | |
| Bani Naim 2 | 16378/10284 | 520 | 750 | Lower | 130.17 | 250 | |
| Bani Naim 3 | 17040/10363 | 500 | 750 | Upper | 162.1 | 250 | |
| Bani Naim 5 | 17271/10090 | | | | | | |
| Bani Naim1ab* | 16965/10163 | | 481 | | 131.62 | | |
| Arroub 1a* | 16309/11420 | | 590 | | 266.16 | | |

Source: CH2MHILL (personal communication, November 1st, 2003)

Over-estimates of the safe yield from the aquifer and under-estimates of the Palestinian population in fact left them with an inadequate supply. Population estimates and projections, based on the Israeli census of 1967, provided a figure of 1.4 million Palestinians in the West Bank by 2000. This was the figure brought to the 1994 bilateral negotiations and on which water provision was calculated. The PNA carried out an internationally monitored census that was completed the year after the signing of the Oslo Accords. This gave the Palestinian population of the West Bank as 1 873 476 and projected to exceed two million by the turn of the millennium (PCBS, 1997). The population of the city of Hebron in 1974 was estimated by the Israeli authorities to be 38 000 and projected to reach 100 000 by the year 2000. This estimate and projection were used for determining the water needs of the city (Tahal, 1975). The 1996 census gave a figure of 119 230 for the city (PCBS, 1997) which, at the average 4% per year growth rate of the time, would give a population of 139 474 for the year 2000. These demographic miscalculations resulted in a per capita allocation to the Palestinian population that was seriously inadequate.

Thus the expected alleviation of water stress for the Palestinians in the Hebron and Bethlehem districts did not take place. Special difficulties were created during the interim period. Expectations that the timetable set by the Oslo Accords would be honoured were not realised. There was, therefore, constant ambiguity as to who could and could not make decisions with respect of infrastructure to improve water supply to those areas from which the Israeli forces might withdraw.

The situation became steadily worse as the 1990s came to an end. Failure to implement the stages leading to a Final Status Agreement and failure by a series of US-led meetings to address the fundamental issue of ending the occupation and all that was contingent upon it, made serious confrontation inevitable. The *Al Aksa Intifada*, so-named after Ariel Sharon's very provocative encroachment on to Islam's most holy site in Jerusalem, effectively brought the peace process to an end. However, throughout this period, the Joint Water Committees (JWCs) set up by Article 40 continued to meet, unlike all other committees set up by the Oslo Accords. Their ability to actually improve the water situation was extremely limited in the political climate of the intifada. Thus the Palestinian population continued to receive an inequitable supply. The more remote hill villages suffered most from continued water deprivation.

In 2003 there were about 650 000 Palestinians in the Governorates of Bethlehem and Hebron, receiving 18.2 million m³ yr⁻¹ water supply of which 11.37 million m³ was purchased from Israel, the remaining 6.83 million m³ coming from the new wells drilled with funding from USAID. The average Palestinian in the southern West Bank received

72 litres per capita per day, but many in the more remote hill villages received only about 44 litres. The Deputy Chairman of the PWA, Fadel Kawash, considered that quantities supplied to the Palestinians of this area must double by 2004 in order to alleviate the severe water stress suffered by these people (TJT, 2003).

Israel maintained control of access to nearly all of the wells including the new PWA wells. As Israel tried to crush the uprising against the occupation by massive military force and the imposition of severe travel restrictions, small concessions were sought to alleviate hardship. Although an agreement had been reached between the PWA and the Israeli Water Commission that deliberate damage to water infrastructure would not take place, the Israeli army evidently did not recognise that it was bound by such an agreement. The US Embassy sought to deter military damage to water infrastructure and lessened the deliberate destruction caused in the early part of the violent conflict. The World Bank estimated that the Israeli army caused more than \$20 million worth of damage to the Palestinian water sector (Hajeer, *et al.*, 2003).

The Palestinians in some of the hill villages had to use polluted spring water when the rainfall collected during the winter was not replenished during the hot dry summer. Even if the privately operated water tankers could reach these communities, the cost charged in the summer of 2003 of \$10 per m³ was more than these poor villagers could afford. Some families went into serious debt because tanker water was the only water available and could be supplied on credit. Some women tried to filter the polluted spring water through the fine weave of their veils. Friends of the Earth Middle East lobbied the Israeli authorities to allow tankers to enter the villages as 'emergency vehicles'. This NGO also tried to get the tanker operators to charge affordable prices.

CONCLUSION

Wastewater treated to appropriate standards for non-domestic purposes could provide a significant resource as well as protecting the surface and subsurface water environment. US influence eventually resolved the apparently intractable problem of getting Israeli and Palestinian politicians to come to an agreement on establishing a wastewater treatment plant in the southern West Bank. Construction was delayed mainly due to the volatile situation that existed in the area from the autumn of 2000 when the work should have begun.

The most recent phase in the intervention of the UN, USA, the EU and Russia in the Israeli-Palestinian conflict was the so-called *Road Map*, published, after months of delay at Israel's request, in the spring of 2003. The *Road Map* mentions the water issue rather vaguely only once. It does not commit

the parties to resolve the dispute over water and there are no 'performance parameters' for measuring any progress towards such a resolution.

In spite of the serious hostility, lack of trust and unhelpful attitudes adopted by the parties, a managerial solution to the present water crisis is possible. However, a resolution that seeks a just and equitable allocation of the scarce water resources available needs courageous political decisions that run counter to the idealistic, cultural stance adopted by current politicians on both sides of the conflict (Scarpa, 2003).

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