Towards a Middle East at Peace: Hidden Issues in Arab–Israeli Hydropolitics

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ABSTRACT When peace negotiations do one day resume between Israelis and Arabs, shared water resources will again take centre stage, acting both as an irritant between the parties, and as a tremendous inducement to reach agreement. The ‘hidden’ hydropolitical issues that will need to be resolved between Israel, Lebanon and Syria in the course of eventual boundary talks are considered. Two of these issues, the village of Ghajar and its relation to the Wazani Springs, and the possibility of groundwater flow from the Litani to the Jordan headwaters, change the fundamental understanding of the relationship between hydrologic and political claims, and could threaten the entire approach to water negotiations both between Israel and Syria and between Israel and Lebanon. Fortunately, other agreements within the basin can inform the path solutions here might take. The most critical step towards conflict resolution is separating the concepts of territorial sovereignty from water security. This can be done most effectively by offering joint management, monitoring and enforcement strategies, as well as encouraging greater transparency in water data across boundaries.

Introduction

Despite the current deadly, and apparently intractable, conflict between Israelis and Arabs, history suggests that peace negotiations will one day resume. When they do, shared water resources will again take centre stage, acting both as an irritant between the parties, and as a tremendous inducement to reach agreement. This paper focuses on the ‘hidden’ hydropolitical issues that will need to be resolved between Israel, Lebanon and Syria in the course of boundary talks. Intricate and contentious issues exist at many points within the Jordan River watershed, particularly the Banias, Hasbani and Yarmuk tributaries, and along the Sea of Galilee. The crux of the matter is that when one speaks of the difference in positions between Syria’s insistence on June 1967 borders and Israel’s claim to those of 1923, one is speaking about water. Although the territory in dispute only comes to about 60 km² and holds no security value in a traditional sense, the topography is such that whoever gains the territory

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gains access to a small but critical hill overlooking the Banias Springs, access to both sides of a stretch of the Jordan River, and ‘hydrostrategic’ positioning along about one-third of the Sea of Galilee, the town and hot springs of El-Hama/Hamat Gader, and a brief but sensitive stretch of the Yarmuk River. (See Figure 1—boundaries of 1923 and June 1967.)

These issues, however intricate, have been well known for years—Israelis, Syrians and a number of thinkers from outside of the region have all contributed their analyses towards possible solutions. However, there are other essential issues in talks about water that have not been thought out in quite as much detail, if at all. Two of these issues, the village of Ghajar and its relation to the Wazani Springs, and the possibility of groundwater flow from the Litani to the Jordan headwaters, change the fundamental understanding of the relationship between hydrologic and political claims, and could threaten the entire approach to water negotiations both between Israel and Syria and between Israel and Lebanon. As a consequence, the depth of these ‘still waters’ offer new and unforeseen obstacles which threaten not only the tenor, but the very tractability of the peace talks.

Resolution of these issues will take creativity and perseverance. Fortunately, other agreements within the basin can inform the path solutions here might take. The most critical step towards conflict resolution is separating the concepts of territorial sovereignty from water security. This can be done most effectively by offering joint management, monitoring and enforcement strategies and by encouraging greater transparency in water data across boundaries.

Ghajar and the Wazani Springs—Syria, Lebanon or Israel?

Many claims have been made, both in the popular press and in academia, about the June 1967 War being a ‘water war’, launched so that Israel might gain ‘hydrostrategic’ positioning. The only problem with such conjectures is a complete lack of evidence. It is quite true that, in the events leading up to the 1967 war, conflict over water resources between Syria and Israel contributed to tensions leading to the fighting, however the hydrologic aspect ended almost a year before the beginning of the war (see the articles in Amery & Wolf (2000) for more details on this topic).

Despite attacks from Syria during the fighting, Israeli Defence Minister Moshe Dayan was extremely reluctant to launch an attack on the Golan Heights because of the presence of Soviet advisors, and the consequent danger of widening the conflict. For the first three days of the war, Dayan held off arguments from several of his advisors, including the commanding officer (CO) of the northern command, David Elazar, for launching an attack on the Golan Heights. Finally, a delegation from the northern settlements, who had often experienced Syrian sniping and artillery barrages, travelled to Tel Aviv to put pressure on Dayan to take the Heights to guarantee their security. Only then, on 9 June, did Israeli forces launch an attack against Syria.

In the taking of the Golan Heights, the water sources were incidental conquests as Israeli forces moved as far east as Quneitra. The only exception was the ‘taking’ of the tiny town of Ghajar, an Alawi village that had no strategic importance in the military sense, in that it neither contained combatants nor was it situated in a strategic position. The village does, however, directly overlook
Figure 1.Q13 Boundaries of 1923 and June 1967. Source: Sachar (1989).
the Wazani springs, which contribute about 40 million cubic metres per year (MCM/yr) to the Hasbani’s total annual flow of 125 MCM/yr. During dry summer months, the Wazani is the only flowing source of the Hasbani.

It turns out, however, that Ghajar was not even taken during the war. During the fighting, Israeli troops stopped directly outside of the town. They did this because, on Israeli maps, Ghajar was Lebanese territory, and Israel did not want to involve Lebanon in the war. Ghajar was actually Syrian—it had ‘simply’ been misplaced on 1943 British maps. (Compare Figure 2, from the British perspective, with Figure 3, a Lebanese map.)

The original error in determining the location of the village stems from the British map prepared by the ‘Survey of Palestine’ in 1932. The error originated as a result of demarcating the border between Syria and Lebanon as a geometrically straight line to the west of the river, instead of a border winding along the cliff on the west bank of the river. Also, the original border leaves the river and turns in a northeasterly direction at map co-ordinate 2468 (north) and not at map coordinate 2464 (north) as indicated on the British maps. The main reason that the frontier between Syria and Lebanon was not marked accurately on the British maps is that this was an internal frontier inside an area under one single mandate, the French Mandate.

Cut off from the rest of Syria and surrounded by Israel on three sides during the war, a delegation from Ghajar travelled to Beirut to ask to be annexed. Lebanon was not interested, arguing that if they annexed a Syrian village, the Arab countries would regard them as partners of Israel who were dividing the territory of the defeated Syria among themselves. Three months after the war, with the village cut off and isolated, another delegation travelled
Figure 3. Syria–Lebanon Frontier, according to Lebanese map. Source: Map of Lebanon, Tyre-Nabatiya, designed and published by the Lebanese Army (1963).

to Israel and asked that the village become Israeli. Only then did Israel extend control north through Ghajar (Wolf, 1995).

It was only after the annexation that Israeli authorities understood that the Wazani Springs, which were located at the foot of the village and were therefore also annexed by Israel, were the most important sources of the Hasbani River during the dry summer months. (It should be noted that Moshe Brawer wrote about the Wazani’s importance in 1964, but the article was not published until 1968.) Under the British Mandate, it had been assumed that the Hasbaya Springs, some 18 km to the north of the boundary in Syria, were the main sources of the river. The change from an intermittent to a perennial river is very conspicuous, but the change from a small perennial river to a river with a strong flow is not so conspicuous, such that the Wazani Springs did not get special attention.

When the boundaries were being demarcated in the 1920s, the British representative, S. P. Newcombe, wanted all the sources of the Jordan River to be part of Palestine. If Newcombe had known that the main source of the Hasbani River originates no more than 4 km north of the frontier that had been established, and its inclusion in the British-mandated area would not cut off the road from Kuneitra to Beirut, which was important to the French, he probably would have insisted that the Wazani Springs also went to the territory controlled by Great Britain.

The issue is convoluted by one final deviation in the boundary: next to the village of Ghajar, the Hasbani River flows through a deep, narrow, steep-sided valley. The sides of the valley reach 70 m down to the river, and the frontier ran half way up the steep western embankment; that is, it gave Israel control of the whole of the riverbed including the Wazani Springs (Livneh, 1988). When the Israel Defence Forces (IDF) made a road along the frontier to patrol the area and
constructed a security fence, the engineering corps found it difficult and costly to construct the road along this part of the border, because the western bank was rocky. Therefore, the road was constructed on the plateau east of the river. As a result, a strip was left between the two frontiers that was in fact no-man’s land, and that was created as a result of the discrepancy between the official, *de jure*, frontier and the *de facto* physical frontier, the security frontier that was patrolled by the IDF (see Figure 4). The strip between the two frontiers is not large, but it includes both the springs and the river (Medzini, 2000).

**Implications for Negotiations between Israel and Syria**

The vast majority of writings on water-related negotiations between Israel and Syria focus on the Yarmuk, the Banias Springs (another major headwater of the Jordan), and the Jordan itself—*not* the Hasbani. In the boundaries of 1923, the Banias themselves were within the French Mandate, but flowed only 800 metres until they crossed the border into the British Mandate. It was the waters of the Banias that set off Israeli exchanges of fire in the mid 1950s and mid 1960s. The Johnston Accords of 1953–1955—the only comprehensive allocation scheme for the basin—describe Syrian allocations only from the Banias, the Jordan and the Yarmuk, not the Hasbani. (While the Technical Committees of both Israel and the Arab side agreed to the terms of the accords, they floundered on the political side. Although the comprehensive approach was abandoned after the Sinai Campaign in 1956, the accords have been the basis for all subsequent talks between Israel and Jordan, and have been raised in the Israel–Palestine context as well.)

What happens when the correct maps are used for the first time in negotiations between Israel and Syria over the Golan Heights? Will Syria claim to be a Hasbani riparian and, for the first time, claim rights to those waters? Will Israel insist on continued uninterrupted flow? Since Israel’s claim would be based on a wide variety of types of boundaries, including those of the mandates and both the *de jure* and *de facto* boundaries of 1967, would these claims be

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**Figure 4.** *De jure* and *de facto* frontiers along the Hasbani River, facing south
considered legitimate? If Israel bases these claims on the boundaries of 1967, what impact will that have on other shared boundaries, where Israel is claiming that the 1923 boundaries are the last legal delineation? Given the vague and often contradictory state of international water law, which argument can prevail?

The Litani and the Jordan—A Connection?

Perhaps no issue is as sensitive to Lebanon as protecting its sovereignty over the waters of the Litani River. While the river flows entirely within Lebanese territory, at one point it flows within 8 km of the Hasbani, which in turn flows into Israel and the Jordan River. Recognizing the potential of connecting the two systems, early Zionists and, later, Israelis, regularly developed schemes to divert the waters of the Litani into the headwaters of the Jordan, beginning as far back as 1918.

At Zionist insistence, early boundary proposals included the Litani within the British Mandate; the Israeli counter to the Johnston Plan included a connection between the two basins; and Israel not only captured hydrographic charts and technical documents relating to the Litani in the midst of its 1982 invasion of Lebanon, but until 2000 retained its ‘security zone’ right up to the bend in the Litani which is closest to the Hasbani. Moreover, since that invasion, various threads of a ‘hydraulic imperative’ theory have been developed, where Israel is accused variously of: launching the 1982 war primarily as a quest for water (Cooley, 1984; Stauffer, 1982); building a secret diversion tunnel to siphon off Litani water (Amery, 2000); and/or launching a massive trucking operation to bring Litani water overland into Israel (Naff, 1993).

All aspects of the ‘hydraulic imperative’ have been denied by Israel, which officially recognizes Lebanese sovereignty over the river. These denials are bolstered by quite a bit of investigation, which finds no evidence of any existing diversions, yet recognizes both the difficulty of gaining access to the territory in question, and the near impossibility of proving the absence of just about anything (see, for example, Libiszewski, 1995; Soffer, 1994; Wolf, 2000). Nevertheless, it has been acknowledged that plans for a diversion are on the books, “to be developed with Lebanese cooperation” (quoted in Wolf, 1995, p. 59.) According to former Technology Minister Yuval Ne’eman, “we could make good use of water from the Litani, should Lebanon ever care to sell some” (quoted in Wolf, 1995, p. 59).

Looking ahead to negotiations between Lebanon and Israel, these sensitivities are again being exhibited. Frey and Naff suggested that, “although water may not have been the prime impetus behind the Israeli acquisition of territory … it seems perhaps the main factor determining its retention of that territory” (Frey & Naff, 1985, p. 76). Amery (2000) argues that, whether a diversion exists or not in reality, it certainly exists in the minds of the people, and therefore cannot be dismissed without including the public in decision making. Earlier, Amery speculated that Israel will, at minimum, pressure Lebanon to make Litani water available as a prerequisite to Israeli military withdrawal (Amery, 1993).
A Hydrogeologic Imperative?

All of the above argument and counter argument is based on the universally accepted assumption that the Litani and the Jordan are in fact two separate basins. What if they are not? What if, rather than a secret, man-made diversion, it turns out that the movement of underground water actually flows naturally from the Litani to the Hasbani? And what if it is Lebanon, and not Israel, which is diverting water away from its natural path to its neighbour’s territory? To prove or disprove such a natural connection would require an extensive hydrogeologic investigation or a bi-national comparison of hydrologic data which, in turn, would require extensive co-operation between Israel and Lebanon, the latter of which would of course have no incentive to participate.

But the possibility cannot be dismissed out of hand and, if history offers any lessons, the investigation should come well before any treaties are signed. What evidence exists is certainly intriguing in its implications.

(1) In as thorough an examination as is possible, given difficulties of access to territory and records, Kolars (1993) investigates the hydrology of the Litani basin and, when he tries to calculate the water budget (inputs minus outlays) for the natural average flow of 920 MCM/yr, he is unable to account for approximately 83 MCM/yr. He further suggests that the catchment areas (the regions where rain percolates into the ground to contribute to a spring or stream) of both the Dan and the Hasbani are too small to account for their respective flows. Moreover, he offers evidence for a geologic structure whereby the flow of the Litani could flow underground towards the springs of the Hasbani, augmenting their flows. Finally, he points out that the ‘missing’ portion of one portion of the Litani, “nearly matches the unaccounted flow of the Wazani and Hasbaya Springs” (Kolars, 1993, p. 41). Kolars’ hypothesis is profoundly sensitive. In a footnote in his own paper, Kolars notes that, after presenting a draft, he received a ‘strong denial’ of his hypothesis by Fathi Chatila, publisher of Arab World International. In a postscript commentary within the same volume, Khalil Mahlouf (1993, p. 63), while acknowledging that “the point is certainly worth further field study”, offers an alternate hypothesis to that of Kolars: Mahlouf points out that there is a series of off-shore springs that occur along the Lebanese coast which, “have total quantities of flow which amount to several times the deficit in the Litani water balance”. (Kolars is not entirely swayed by these arguments. In recent personal communications, he remains convinced that the ‘missing’ water may well end up in the Hasbani.) Were these the only pieces of evidence, we would have to categorize them as inconclusive, and wait for further study. However, we can do a certain amount of investigating from the other side of the border as well. Raw data are available from the flow record on the Israeli side, which may allow us to see if any evidence there presents itself to support or contradict Kolars’ hypothesis.

(2) In the 1960s Lebanon built a dam on the upper Litani at Qirawn and started to divert water out of the basin into the Awali River, to the west, for the generation of hydropower. Because less water flows to the lower Litani subsequent to the diversion, and what water there is, is ‘evened out’ because of the dam, we might be able to detect a sudden drop both in peak flows (the highest flow at any given time) and in total flows in the Hasbani soon after
the dam and diversions went online, if there is an underground connection. The Israel Hydrologic Service has consistent monthly and annual flow records for the Jordan headwaters dating to Water Year 1940, including those for a station on the Hasbani at Ma’ayan Baruch, near the Lebanon–Israel border. (Water Years run from October to September of the following calendar year. All subsequent dates in this section are Water Years.) If we look at the original flow records for the period of 1940 to 1997, we find a sudden and dramatic drop in both total flows and peak flow beginning in Water Year 1972. The first diversion from the Litani went on line in 1965 and the system went to full capacity in 1969.

The drop is hardly insignificant: the total flows from 1970 to 1998 average about 28 MCM/yr, or 20%, lower than flows from 1940 to 1969. The drop in peak flow is even more dramatic: the post-1970 average peak flow is 40 m$^3$/yr, or almost 40%, lower than the pre-1970 average (see Figure 5). This drop does not exist in the rainfall records, nor in any of the other Jordan headwaters. It is reasonably clear that some source of Hasbani recharge, and that of the Hasbani alone, was cut off suddenly in the late 1960s.

Implications for Negotiations between Israel and Lebanon

The most serious implications of a sub-terranean connection between the Litani and the Hasbani would not necessarily be that one might exist, although that would be serious enough given how solidly each side has built their negotiation positions excluding such a possibility, but rather that Lebanon is diverting a portion of that water away from the presumed link. In the last attempt to divide the waters of the Jordan, Eric Johnston in 1955 allocated 35 MCM/yr from the Hasbani to Lebanon out of a total ‘natural’ average of 125 MCM/yr, leaving 90 MCM/yr for Israel. In the 30 years from 1940 to 1970, at least 90 MCM/yr (the minimum required by the agreement) failed to flow into Israel only five times. In the following 28 years, that amount did not make it into Israel 11 times. (Interesting exceptions are the abnormally high peak flows of 1982 and 1983. These were not years of particularly high precipitation, but they immediately followed the 1982 Israeli invasion into Lebanon, where the diversion was reportedly significantly damaged in the fighting.)

The profoundly simple, yet exquisitely sensitive question which needs to be addressed, is this: Does Israel have claims to Litani water? We, like Kolars, cannot answer that question with the data we have at hand. The best we can do, along with Kolars, Chatila and Mahlouf, is echo the call for a thorough investigation. But the answer, quite simply, could change everything.

The United Nations (UN) Convention on the Law on Non-Navigational Uses of International Watercourses, passed by the General Assembly in 1997 but not yet ratified, defines an ‘international watercourse’ as “a system of surface and underground waters, parts of which are situated in different states, constituting by virtue of their physical relationship a unitary whole and flowing into a common terminus” (UN, 1997). In the 1997 vote, Israel abstained and Lebanon was absent, although Lebanon subsequently became party to the convention.

In this discussion, a number of points should be kept in mind. First, for all of its inherent uncertainties, hydrogeology has been referred to as, “as close to
Figure 5. Hasbani flow records—average annual flow (1940–97) and peak flow (1940–89).

Witchcraft as one gets in the sciences”. By adding the evidence of Israeli flow records, the argument for Kolars’ hypothesis may be strengthened in some small way, but we are still a long way from any definitive, or even tentative, conclusions. Uncertainties and alternative hypotheses for the evidence abound: undocumented agricultural development or a physical obstruction in the upper Hasbani might have a similar imprint in the hydrologic record, for example, or perhaps some relevant data are buried within regional hydrologic complexity.

Nor would we presume to suggest that negotiations should wait for the extensive fieldwork which would be required to definitively prove or disprove any of the sensitive claims about the Litani which have been made here and elsewhere. All we offer here are new possibilities that might be investigated, with the hope that peace talks may finally bring a frank and open exchange of scientific information across borders, which will in turn help resolve these issues once and for all.
Conclusions

Despite appearances to the contrary, our goal in this paper is not to throw unnecessary spanners into the negotiating works. Quite the opposite—our purpose is rather to call attention to issues which may be overlooked in the talks before the treaties are signed, in order that the documents negotiated might be made even stronger and more resilient.

Oregon State University’s Transboundary Freshwater Dispute Database includes a collection of the world’s water-related treaties. What is astonishing in the record is just how many of these treaties are based on an incomplete understanding of the hydrology in question, and just how often these misunderstandings lead to tense political standoffs.

The waters of the Colorado were already over-allocated between the upper and lower US states when a treaty with Mexico was signed in 1944, which also neglected the entire issue of water quality. After legal posturing on both sides as water quality continued to degrade, the US subsequently built a massive desalination plant at the border so that the water delivered would at least be usable. Currently, the fact that shared groundwater is likewise not covered in the treaty is leading to its share of tensions between the two nations.

In December 1996, a treaty between India and Bangladesh was finally signed, allocating their shared Ganges waters after more than 35 years of dispute. In April 1997, however—the very first season following signing of the treaty—the two countries were involved in their first conflict over cross-boundary flow: water passing through the Farakka dam dropped below the minimum provided in the treaty, prompting Bangladesh to insist on a full review of the state of the watershed.

The most instructive example is from just downstream of our area in question. In 1994, Israel and Jordan signed one of the most creative water treaties on record. It has Jordan storing winter runoff in the only major surface reservoir in the region—the Sea of Galilee—even though that lake happens to be in Israel; it has Israel leasing from Jordan in 50-year increments wells and agricultural land on which it has come to rely; and it creates a Joint Water Committee to manage the shared resources. But it did not adequately describe what would happen to the prescribed allocations in a drought.

In early 1999, this excluded issue roared into prominence with a vengeance, as the worst drought on record caused Israel to threaten to renege on its delivery schedule, which in turn caused protests in the streets of Amman, personal outrage on the part of the King of Jordan, and, according to some, threatened the very stability of peace between the two nations before a resolution was found.

Such are the dangers of treaties which do not allow for the vagaries of nature and the scientific unknown. And it is precisely to ameliorate such dangers that we present these issues here, in the hope that the treaties which do result from the ongoing talks will be enhanced by the appropriate application of the best science available.

Notes

1. Our data come from three sources. Monthly peak and total flows are reproduced in the Israel Ministry of Agriculture’s Hydrological Yearbook of Israel: Summary of Records Prior to October 1990 (Israel Ministry of Agriculture, 1992). These were confirmed for 1960 through 1980 with copies of the original field notes. Post-1990 annual data are from Klein (1999). These data, reproduced as Figure 5, record no other sudden changes, such as gauging practices or location, which might affect the results.

3. Available at http://www.transboundarywaters.orst.edu

References