

Hydro-Peace in the Middle East: Why no Water Wars? A Case Study of the Jordan River Basin

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The Middle East is very poorly endowed with freshwater: the region ran out of water resources to meet its strategic needs—for domestic and industrial use as well as for food production—in 1970. Despite depleted water resources and growing water demand pushed by population growth, international relations over water have, if anything, become less tense since 1970. The reason is that water has been available on the international market in the form of “virtual water.” Indeed, economies that can import grain avoid having to mobilize scarce freshwater from their own resource base to produce wheat themselves. By the year 2000, the Middle East and North Africa were importing fifty million tons of grain annually, satisfying the largest demand for water in the region—food production. The remaining 10 percent of water demand for drinking, domestic, and industrial use may soon be met through low-cost desalinated seawater. The global political economy of water use and trade has had important impacts on the way water is perceived in the Middle East. But at the same time, the impact of the global system has been perverse in that the availability of virtual water has slowed the pace of reforms intended to improve water efficiency.

The Middle East is the most water-challenged region in the world, with little freshwater and negligible soil water.¹ Water is therefore a key strategic natural resource, and realist theory, as

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well as popular intuition, has it that the scarcity of water in the region will lead to water wars. Despite growing water demand, the Middle East has shown no signs of a water war since some minor military events in the northern Jordan Valley in the early 1960s.² On the contrary, there is much evidence of cooperation over scarce water resources in the region, especially in the Jordan River Basin, where freshwater is scarcest.³ Water is too important to be left to the uncertainties of *rapproches de force*.⁴

Many Middle Eastern economies must use fresh surface and groundwater resources for food production. In contrast, in temperate regions, up to 90 percent of the water used in food production comes from naturally occurring water in soil profiles, called soil water. Soil water differs from freshwater in that it can only be used in agriculture to produce crops. Freshwater can be used by all sectors (for domestic, industrial, and agricultural activities) and can be lifted, pumped, and transported. It can therefore be assigned an explicit value in commercial transactions. Although soil water can only physically be used *in situ*, it can also be “moved” and exported through agricultural production and trade.

Indeed, at the global level, soil water resources are in surplus. Fortunately for the water-short economies of the Middle East, this soil water can be made accessible via trade in staple food commodities

such as grain. Every year, farmers and traders in the Middle East move volumes of water equivalent to the flow of the Nile into Egypt, or about 25 percent of the region’s total available freshwater. The water “imported” in this way can be called “virtual water.”⁵ To produce one ton of wheat requires one

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thousand tons (cubic meters) of water. Importing a ton of wheat therefore relieves a community from having to harness one thousand tons of its own water resources.

The purpose of this analysis is to show, first, that the perceptions of water resources in the Middle East are constructed, namely that the notion of water scarcity is based on too narrow an interpretation of freshwater availability. Second, the reason this constructed perspective has endured thus far lies in the effectiveness of the international political economy, which has in fact

solved the region's water resource problems, albeit invisibly and silently. Finally, it is important to draw attention to the impact of the international political economy on the region, which has been perverse as well as favorable. Indeed, the global trade system has slowed the pace of water policy reform and has distorted international relations where shared freshwater resources are in contention.

Constructed Knowledge and the “Sanctioned Discourse” on Water in the Middle East

In the realm of international relations theory, the case of international shared waters in the Middle East can be understood within a nonrigorous, realist framework. In each river basin there is a hegemon, such as Turkey in the Euphrates-Tigris river system, Egypt in the Nile river system, or Israel in the Jordan Basin. Within a realist framework, riparian relations can be explained in terms of each country's capacity to project power.⁶ Functional approaches and regime theory have not provided a useful basis for analysis because there are no international structures that work in the region.⁷

Contentious issues arising over shared freshwater resources are also embedded in what Barry Buzan calls “security subcomplexes.” Securitization theory, well articulated in the case of the Middle East by Buzan, contrasts the high politics of extreme circumstances—“security politics”—with the “normal politics” that they interrupt, but finally confirms the realist analysis.⁸ Buzan identifies the Middle East and North Africa as a significant security complex containing three subsystems. Whereas in the Gulf and in North Africa water is only a peripheral issue, the competition over water resources is central to the eastern Mediterranean subcomplex, comprising Israel, Jordan, and Palestine. Yet, despite the importance of water as a source of tension, its significance is limited in negotiations between the Jordan Basin riparian states. Instead, symbolic issues have traditionally dominated negotiation agendas.

Water is just one of many contentious issues with which neighboring political economies in the Middle East must contend. For example, the major issues between Jordan and Israel before their negotiated Peace Agreement in 1994 were peace, territorial boundaries, and water.⁹ In the case of Israel and Palestine, there have been five issues—Jerusalem, territorial boundaries, settlements, refugees, and water.¹⁰ When numerous issues are at stake, linkages in negotiation are unavoidable. However, the symbolic significance

of some of the issues at hand, such as defining the status of Jerusalem, determining borders, and gaining a lasting peace will typically overwhelm other, economically significant disputes (e.g., joint water management, the right of return for refugees)—even when these are strategically profound. For example, in the 1994 Jordan-Israel Peace Agreement, gains in terms of symbolically charged issues such as suing for peace and obtaining favorable territorial boundaries came at the expense of losses on water claims for Jordan.

In fact, in the Jordan Basin, water policy, including water allocation decisions and joint management of common freshwater resources, is typically formulated based on “constructed knowledge,” or the product of biased views toward water resource security. Indeed, important decisions regarding water resources depend on public perceptions of water security, which are manipulated and distorted—i.e., “constructed.” Policymakers purposefully downplay their economies’ water deficits because politically, such a risk-free approach to water policy is easier than to confront the seemingly intractable problems posed by acute water scarcity. What has sustained these distorted, “constructed” notions of water security thus far are the global trading system and access to virtual water.¹¹ Throughout the past fifty years, Middle Eastern governments have leveraged the global political economy in order to implement otherwise unsustainable water allocation policies. Yet, instead of publicizing the contribution of international trade to solving the region’s growing water scarcity problem, policymakers have kept “virtual water” imports, in the form of grain and food commodities, invisible economically and silent politically. Indeed, to discuss them publicly would contradict deeply held beliefs regarding water security (as well as each country’s independent national water policies), which would be politically destabilizing to say the least.

As a result, the spectacularly successful benefits of international trade, conforming to classical notions of comparative advantage, have been subordinated to the “sanctioned discourse” on water in the region.¹² The “sanctioned discourse” on water is that Middle Eastern economies only need a little more water to be “secure.” Politicians, the agricultural sector—the single largest water consumer in local economies—and the media all reinforce the sanctioned discourse and advocate self-sufficiency in water and food production, without ever clearly defining these terms. These policy goals, highly charged politically, are rarely examined or challenged publicly. For politicians and policymakers, the importance of virtual water is that it allows the pretense, perhaps better described

as the fantasy, of claiming that water deficit problems are being solved domestically and that their countries are achieving self-sufficiency in water and food production.

However, such distorted risk awareness regarding water usage among the region's populations has significant, adverse impacts on the way negotiations over water resources are approached or even initiated. The sanctioned discourse is equally evident in the efforts riparian states make to avoid negotiations over common water resources and in their negotiating strategies once they have initiated conflict resolution efforts. In the case of the Israel-Palestine negotiations, a significant turning point was reached when the focus of the negotiations shifted from the contradictory principles of sovereignty, espoused by the Palestinian negotiators, and prior use, argued by Israel, to those of equitable utilization. Equitable utilization will always be difficult to implement, but it does have the merit of integrating international and national economic processes into a final agreement, thereby enabling a solution that improves the livelihoods of local populations instead of merely focusing on the narrow issue of water deficits. Access to virtual water and, in due course, desalinated water will contribute both to economic well-being and to decreasing water scarcity by freeing up scarce freshwater resources for other, nonagricultural purposes.

That such constructed knowledge dominates water policy is not unusual, nor even reprehensible. Recognizing the phenomenon of constructed knowledge is, however, critical for understanding the discourse that surrounds water security and water policy in the Middle East.

The Jordan Basin

The relations between riparian states of the Jordan Basin have been characterized by very intense international politics over diverse, yet linked issues. Contention over water has proved to be subordinate

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to symbolic and territorial issues such as peace, Jerusalem, borders, settlements, and the return of refugees. The riparian states in the basin have all been strong adherents of the “sanctioned discourse”

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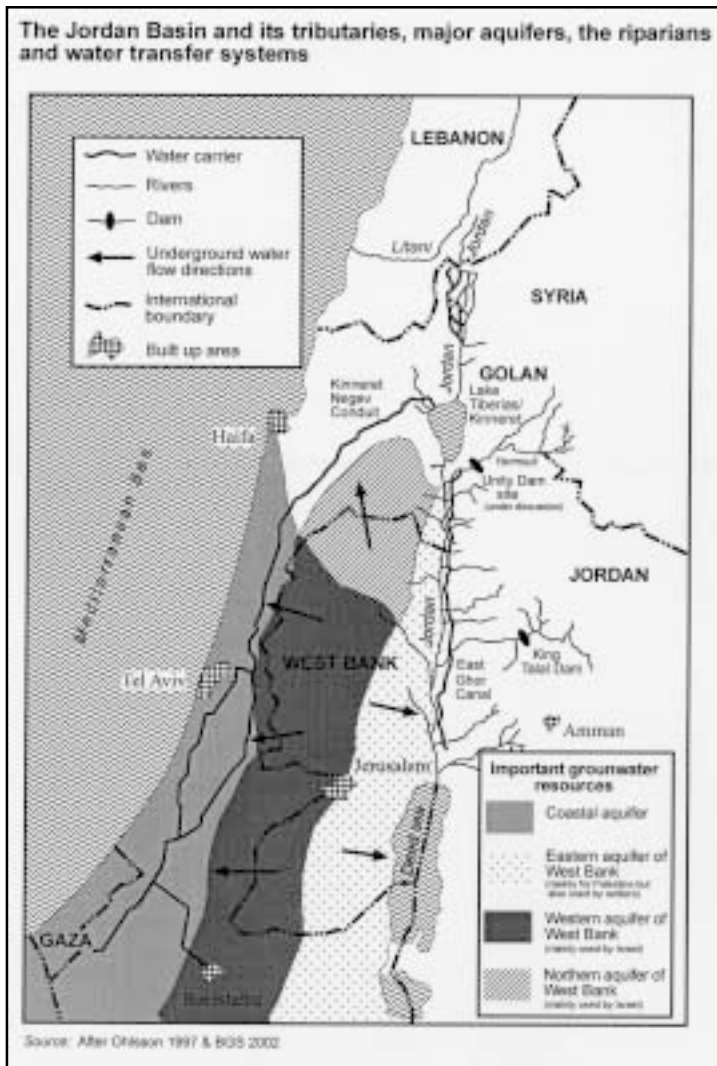
on water. Even Israel has relapsed into a confusing and contradictory water policy since the peace talks began in 1992, despite having charted a new course in the mid-1980s that rejected the usual assumptions about water politics. Jordan is currently in a transitional mode and the government’s water policy seems to be moving away

from the sanctioned discourse. Water policy in the Jordan Basin as a whole has been a parable of how political impediments attenuate principled innovation.

The history of hydrogeopolitics in the Middle East during the second half of the twentieth century has been characterized by intense, occasionally armed, hostility. In the late 1940s, the economies of the region could be regarded as water secure, with enough water to meet both domestic and industrial needs as well as food production requirements. Since then, however, the population of the basin has increased from about three million to over fifteen million today. Accordingly, the use of freshwater increased about six-fold in half a century. While the region’s water endowment has remained the same, heavy technical interventions have taken place to divert water for various purposes, radically altering the levels and patterns of use. Initiatives like Israel’s urban wastewater reuse program have not contributed significantly to increasing water resources. Clearly, the water resources of the Jordan Basin countries have been very seriously tested, and in these intense demographic and economic circumstances, it is remarkable that there has been so little conflict over water.

The Jordan Basin is also a useful laboratory in which to observe the miraculous workings of economically invisible and politically silent “virtual water,” accessible primarily through the international grain market.¹³ Given the current population of the basin, the region would need about fifteen billion cubic meters of water to be self-sufficient. However, there are less than three billion cubic meters of freshwater available annually, not counting additional soil water in the northern part of the basin, which is

Figure 1: The Jordan River Basin



Source: L. Ohlsson, *Hydropolitics: Conflict over Water as a Development Constraint* (London: Zed Books, 1995); British Geological Survey, *A Brief Summary of the Hydrogeology of the West Bank* (Wallingford, UK: BGS, 2002).

estimated at one to two billion cubic meters, but which is not fungible. Yet this annual deficit of ten to twelve billion cubic meters, which has existed since the 1950s, is not publicly discussed. Nor is the fact that neither Israel, Palestine, nor Jordan can meet their food needs relying solely on their freshwater resources. Instead, policymakers speak of running out of water in the future. The con-

structured discourse about the tractability of the water supply problem overwhelms any attempt to introduce the politically unwelcome statistics of stark deficits.

Finally, there has not been a significant amount of negotiation over water issues either. The only agreements reached came toward the end of the period. In 1994, Jordan and Israel signed a peace agreement with articles specifically addressing water.¹⁴ In this sense too, the Jordan Basin provides a useful case study because negotiations over water, albeit strongly linked to other highly politicized issues, have already been initiated, though only long after water shortages became acute.¹⁵

Political Ecology in the Jordan Basin

The political ecology of water resources and management in the Jordan Basin countries in the last half of the twentieth century can be considered by decade. The 1940s were a period of massive social and political disruption. The armistice, which marked the end of the Arab-Israeli conflict of 1947-48 and the establishment of a Jewish state, left Israel and Jordan with borders different from those during the period of British administration and different from the boundaries recommended by the UN Partition plan.¹⁶ The new territorial boundaries guaranteed that access to water resources would be contentious.

From 1952 to 1955, the United States tried to devise a rational division of water resources among the Jordan Basin riparian states. The U.S. government sent a special diplomatic mission—the Johnston Mission—to negotiate a basinwide arrangement for optimizing water allocation between Jordan, Israel, and Syria.¹⁷ The U.S. mission's approach to water resource management was imbued by two ideas. First, U.S. water experts were convinced that science and engineering, backed by substantial government funding, guaranteed the success of such ambitious projects. Second, the Johnston Mission was determined to avoid the detrimental consequences of environmental mismanagement. Their model was the Tennessee Valley Authority (TVA), which was set up to address environmental, economic, and social challenges in a poor region of the United States during the 1930s. The lessons from the TVA showed that to reverse resource depletion, both careful planning and strict regulation of resource use were necessary, whereas state-of-the-art engineering could minimize the environmental damage of large-scale water development projects.

The Johnston mission was successful in the technical aspects of resource evaluation. It even came up with numbers that satisfied the water professionals of the three riparian states. But by 1955, it was clear that an agreement for sharing freshwater resources contradicted the polarized politics of Arabs versus Israelis. The ministers of the Arab countries rejected the Johnston Plan. Despite this political failure, the water allocation proposal outlined in the plan still provided a reasonable basis for eventually negotiating a basinwide agreement. Johnston recommended that Syria receive thirty-five million cubic meters per year from the upper Yarmuk tributaries.

Nevertheless, following the Johnston Mission, each riparian state adopted unilateral water policies, which only exacerbated already tense interstate relations. There was even some evidence that armed conflict could occur over water. Israeli policy was geared toward moving what it regarded as its share of Jordan water from the Jordan Valley to the coastal plain. As a result, the 1950s saw the most rapid development of groundwater resources in the history of the area as Israel increased water abstraction from coastal aquifers. Israel managed to mobilize over one billion cubic meters per year of additional water for irrigation. Syria had also extensively developed its irrigation infrastructure, diverting, since the 1960s, roughly two hundred million cubic meters of water annually from the Yarmuk River. Jordan, meanwhile, had expected to use up to 80 percent of the water siphoned off by its two neighbors. One project Jordan had been particularly keen about was the construction of a dam on the lower Yarmuk to control the flow to Jordan's benefit. Proposals to build this dam surfaced periodically, but the annual water flow of the Yarmuk eventually became too unreliable for a dam structure to be economically or environmentally viable.

As a result, serious contention over the waters of the upper Jordan Basin arose throughout the 1960s. Water-related armed conflict took place as both Syria and Israel were successful in frustrating their neighbor's intent to divert water. Syria abandoned its plan to divert water from the Baniyas to the Yarmuk. Israel was forced to opt for the very expensive policy of building a water carrier from the lower-level Lake Tiberias-Kinneret rather than diverting water from the higher levels of the upper Jordan Basin. In June 1967, war broke out, eventually leaving Israel victorious and in control of the entire upper Jordan Basin as well as the West Bank aquifers. Water was neither the trigger for the war nor the main goal of any of its adversaries. The outcome of the war did, however,

determine regional hydropolitics for the next two decades. In the absence of formal agreements, Israel and Jordan had continuous informal meetings and arrangements that enabled them to allocate water during the twenty-five years following the 1967 War. Both countries have tended to take the numbers produced by Johnston in the 1950s as a basis for their discussions.

Between 1986 and 1993, the politics of water allocation in Israel swung dramatically from a precautionary to an opportunistic approach. An environmentalist campaign to reduce water to irrigation gained purchase during the drought of 1986. At the same time, the United States put pressure on Israel to improve its economic efficiency, including the agricultural sector, by threatening to withhold a \$10 billion financial arrangement. The 1991 drought reinforced the policy of economic and environmental consideration. However, two events brought a swift reversal of policy. First, there were unusually heavy rains in 1992, which restored the West Bank groundwater levels and Lake Tiberias-Kinneret to pre-1967 levels in the space of a few weeks. Second, the peace talks started. The coalition of environmentalists, water professionals, and politicians, which had succeeded in introducing and sustaining the cautious water management policy since 1986, lost influence. A coalition focused on security and agricultural interests gained the upper hand. Levels of water withdrawal, which had fallen from two billion cubic meters per year in 1985 to 1.6 billion cubic meters in 1992, rose within three years to 1985 levels.

Israel had demonstrated that it could run its economy effectively with 1.6 billion cubic meters of water per year—less than the peak usage of two billion cubic meters per year, a significant volume of water in a water-scarce region. Palestinians in Gaza and the West Bank only use about two hundred million cubic meters per year. All of Israel's nonagricultural livelihoods, those in industry and services, which produce over 97 percent of the GDP, use only about one hundred million cubic meters per year. Why did Israel reverse its policy? Why did the security concerns take precedence over environmental risks after 1992? The heavy rains certainly facilitated the policy change, but the new risk presented by the newly launched comprehensive peace negotiations led some elements of the Israeli political elite to argue for an increase in water use to improve their bargaining position at the negotiation table.¹⁸ Indeed, since Israel is a downstream state with regard to the western and northeastern aquifers (called the "Mountain Aquifer in Israel"), Israeli negotiators would have more leverage over their coun-

terparts if Israeli water policy advocated a high level of water abstraction. Since any water-sharing agreement would likely allocate water resources based on the amount consumed rather than absolute estimates of water availability, Israel stood to gain a larger share if it consumed more prior to the settlement.

In 1994, Jordan and Israel reached an agreement over water, and Palestine and Israel launched the Oslo peace process.¹⁹ Water need not be a significant impediment to peace between Syria and Israel either, nor between Lebanon and Israel once a deal with Syria is in place. Such circumstances were impossible to imagine even as recently as 1990.

“Virtual Water”

Advocates of political ecology theories contend that the environment, including water resources, is managed in the interests of the powerful. In the Jordan Basin, power relations have been explicit. Since 1948, Israel has achieved a hegemonic position in military terms. Without explicitly aiming to take control of the basin’s water resources, Israel has nonetheless gained sovereignty over these resources in the upper Jordan Basin as a result of territorial expansion and military supremacy.²⁰ Integral to the politics of natural resources is the construction of knowledge to reinforce the position of the more powerful riparian state.

There is a long tradition of constructing knowledge about the water resources in the Jordan Basin countries. Political ecology theory explains the approaches taken by authors of the thirty or more books about water in the Jordan Basin. Lowdermilk’s 1944 study had the clear agenda of justifying a Jewish claim for the regional water resources.²¹ That of Ionides in 1953 was inspired by concern for the sustainable use of the limited water resources for economic and social purposes.²²

In the Jordan Basin, as elsewhere, there has been a tendency to assume that water resources would determine economic outcomes

and would have a significant and predictable impact on the international relations of riparian states. Armed conflict was presumed to be an unavoidable element in riparian relations. Yet toward the end of the century, the economic experience of the Jordan Basin has

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been a spectacular demonstration that natural resources such as water do not determine socio-economic development; on the contrary, socio-economic development determines water management options.

The assumption that local water would be the basis of economic and strategic security has underpinned hydropolitical discourses in all of the riparian states. They ignored growing real water deficits because recognizing such acute water shortages was politically too risky. Awareness of rising grain imports, which were the obvious indicators of increasing water deficits, could be kept out of the debate on water policy because they arrived invisibly and silently. By 2000, grain imports to Israel (including Palestine) and Jordan exceeded five million tons annually.²³ Had all available freshwater resources in the three territories been exclusively earmarked for grain production, the combined efforts of the Jordan Basin riparian states would only have yielded roughly three million tons of grain.

The international market for grain is immensely flexible and an extraordinary phenomenon of political economy. Yet it is by no means an optimizing market system. In fact, its workings are extremely irrational economically.²⁴ The Jordan Basin countries benefit from the low world grain prices, which are a direct result of years of subsidized agriculture in Europe and North America. Though branded as perverse by economists, agricultural policies in the West nonetheless enjoy broad political support. More importantly, these subsidized grain exports enable Middle Eastern governments to continue preaching “sanctioned discourses,” namely that serious water deficits have yet to occur. The growing water deficits over the course of four decades are conspicuously absent from public debate, and the urgency posed by increasing water scarcity in the region has consistently been downplayed.

These perceptions of water in the region, conditioned by the international trade in virtual water, have adversely affected the prospect of successful water negotiations. Indeed, the complex economic processes that enable virtual water to meet local water deficits have been ignored, even though it allows for equitable use of limited freshwater advocated by international lawyers.²⁵ But the political imperative of maintaining familiar approaches based on conventional constructed knowledge continue to dominate negotiating agendas.

Negotiations Toward a Basinwide Agreement

Progress toward a basinwide set of water agreements appeared to be at an advanced stage by 1995. The Israel-Jordan Peace Agree-

ment, followed by the Oslo Accord in 1995, and then by apparently promising talks between Israel and Syria, made it appear that a new era had dawned. However, the assassination of Israeli Prime Minister Yitzhak Rabin in 1996 and the subsequent change of government in Israel reversed the progress toward a set of comprehensive agreements, including those over water. The 1996 reversal is an emblematic example of the tendency highlighted by Mayer that negotiators face much more trenchant, in this case lethal, opposition from the factions at home than they do from across the negotiating table:

When nations negotiate, often the toughest bargaining is not between nations but within them. The reason is simple: international agreements, no matter how much in the national 'interest,' inevitably have differential effects on the factional concerns...experienced negotiators almost invariably insist that the more difficult part of their job consists not in dealing with the adversary across the table but in handling interest group, bureaucrats, and politicians at home.²⁶

The articles in the September 1994 Peace Agreement between Israel and Jordan demonstrated in a classic way the significance of linkages. Jordan apparently obtained two hundred million cubic meters of water per year in tranches of fifty million cubic meters. The first two concessions were relatively uncomplicated and involved Israel's release of the water to Jordan. The second concession also involved some investment in Jordan. The last two negotiated water transfers were severely entangled in conditions of joint investment, which have made them difficult to realize because Jordan was (and remains) short of financial capital for infrastructure projects.

However, the most serious deficiency in the water articles of the Jordan-Israel Peace Agreement was the absence of any provision for drought circumstances. The recurrence of drought in the Jordan Basin is certain. In the event of a drought, freshwater availability should be negotiated by clearly distinguishing reliable sources of water from unreliable ones. Reliable sources of water are those that will be available every year irrespective of drought, provided that surface water and groundwater resources have been managed sustainably. Unreliable water resources are only available in nondrought years. Negotiators always simplify the situation by choosing tentative numbers as if all the water were reliable. Within four years of the 1994 agreement, a serious drought had exposed

this unfortunate assumption. Israel's failure to deliver the negotiated volume was so highly charged politically that the issue quickly went to the King of Jordan and senior Israeli cabinet members for resolution.²⁷

The most recent water negotiations occurred during the July 2000 session at Camp David and at Taba the following year. These meetings merely emphasized the low priority given to water disputes in relation to the more symbolic issues of Jerusalem and territory. The more recent Saudi proposal of March 2002 ignored water entirely. The Saudi proposal was to extend recognition to Israel by twenty-two Arab governments in exchange for a return to 1967 borders and consideration of the position of Palestinian refugees.

These recent peace plans should not be interpreted as a sign that water has become unimportant to either side. If anything, the establishment of the Joint Water Committee (JWC), an institution associated with the Oslo Accord, underscores the importance each side confers on water issues. The JWC continues to hold regular meetings—even during the height of the second *Intifada* in 2001 and 2002. In January 2001, a joint statement by the Israeli Water Commissioner and the head of the Palestinian Water Authority called on both sides to avoid damage to the water infrastructure and interference with water supplies.²⁸ At the same time, the Joint Water Committee is a source of frustration to Palestinian professionals as it is subject to the Israeli Defense Force views on security. Nevertheless, water management throughout the 1990s is a testament to the possibility of cooperation over this important strategic resource, and ensures that water will remain high on the agenda in both Palestine and Israel, despite the overwhelming social and security disruptions since September 2000.

Water Resources in the Twenty-first Century Middle East

By the year 2000, a number of phases of Israeli immigration and natural population growth in Jordan, Gaza, and Syria had increased population within the basin to over fifteen million. Freshwater resources have not increased beyond the three billion cubic meters per year available in the 1950s. Soil water resources also remain unchanged. Water resource requirements for self-sufficiency, including food requirements, have risen to fifteen billion cubic meters annually. Some would regard this as a low estimate, especially as standards of living increase. Others would also correctly

argue that it would not be possible to close down all irrigated farming. Even the three billion cubic meters of freshwater available annually is not, therefore, a secure level for the nonagricultural demands of current and future populations. Clearly, the populations of the basin currently need between four and five times the freshwater to which they have access, soil water being a negligible element in the water balance. The significant amounts of freshwater required to meet the growing food needs of the basin's populations can only be accessed via international trade in virtual water.

The relatively small amounts of water needed for domestic and industrial use—only 10 percent of the total required for self-sufficiency—are much less of a challenge. Indeed, desalination technology holds great potential for adequately supplying nonagricultural water demand. Israel had delayed installing desalination capacity, judging that the period after a peace agreement with Palestine would be the best circumstances in which to announce its desalination program. However, with the deterioration in relations with Palestine after the July 2000 Camp David meeting and the onset of a drought, Israel brought forward its program and announced in November 2001 its first plant with a capacity of fifty million cubic meters per year. A second plant was announced in spring 2002, adding another fifty million cubic meters per year in desalination capacity. These were part of a planned four hundred million cubic meter capacity. Construction of two plants to produce a total of one hundred million meters of water annually began in 2002. Ariel Sharon, as Infrastructure Minister in 1998, suggested that Israel would desalinate up to eight hundred million cubic meters per year within the first decades of the twenty-first century. The economies of the Jordan Basin are likely to be desalinating between one billion and 1.5 billion cubic meters of water by 2020. These volumes of high quality water would increase the currently

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available levels of freshwater by 50 percent. Many Israeli water professionals have realized that manufacturing water will be much easier than negotiating it. Indeed, it will be less complicated and more secure to manufacture water than to depend on its ongoing

provision by hostile neighbors, even if legal entitlement or a negotiated entitlement could be achieved.

The rapid changes in Israeli water management and allocation policies confirm that water can easily become a politicized issue. Such shifts in national policy have a profound impact on the negotiating positions adopted by contending riparians. Any understanding of national and international water in the Middle East region can only be achieved by examining closely the driving political forces that generated particular environmental, technological, and especially economic policies. However, it is the global trading system that provides the strongest explanation for the water policies adopted by the Jordan Basin riparian states. Virtual water enables serious water deficit economies to solve their water problems inexpensively, invisibly, and without political cost. More importantly, global trade enables Middle Eastern political economies to construct false but widely accepted notions of water security and to reinforce politically comfortable but economically and environmentally very suboptimal water allocation policies. The suboptimizing role of virtual water is that its availability slows the adoption of much needed water policy reform. Necessary but politically difficult measures—especially reforms enabling more efficient water allocation—which would achieve higher returns on scarce water assets, are avoided because of the perceived political costs of introducing them. The first decades of the twenty-first century will be subject to the same ideas as those that shaped water policy and negotiating positions in the previous half-century. Politics will also continue to dominate the water sectors of individual political economies as well as waters that are shared internationally.

Notes

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² M. Haddadin, *Diplomacy on the Jordan: International Conflict and Negotiated Resolution* (Boston and Dordrecht: Kluwer Academic Publishers, 2001). See also A. Medzini, *The River Jordan: the Struggle for Frontiers and Water* (London: SOAS Water Issues Group, 2001).

³ E. Feitelson and M. Haddad, *Management of Shared Groundwater Resources: the Israeli-Palestinian Case with an International Perspective* (Boston and Dordrecht: Kluwer Academic Publishers, 2001). See also Haddadin, *Diplomacy on the Jordan*.

⁴ J. Waterbury, *The Hydro-politics of the Nile* (Syracuse: University of Syracuse Press, 1979).

- ⁵ For an in-depth discussion of “virtual water,” see J. A. Allan, “The Political Economy of Water: Reasons for Optimism but Long Term Caution,” *Water and Peace in the Middle East: Negotiating Resources in the Jordan Basin* (London: Tauris Academic Publications, 1996), 75-120.
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- ¹⁰ S. S. Elmusa, *Negotiating Water: Israel and the Palestinians* (Washington DC: Institute of Palestinian Studies, 1996).
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- ¹³ J. A. Allan, “The Political Economy of Water: Reasons for Optimism but Long Term Caution,” 77-80.
- ¹⁴ Allan, *Water, Peace and the Middle East*, Appendixes 1 and 2.
- ¹⁵ *Ibid.*
- ¹⁶ A. A. Amery and A. T. Wolf, eds., *Water in the Middle East: a Geography of Peace* (Austin, TX: University of Texas Press, 2000), 75-76.
- ¹⁷ Lowi, *Water and Power*.
- ¹⁸ M. Sherman, *The Politics of Water in the Middle East: an Israeli Perspective on the Hydro-political Aspects of Conflict* (London: Macmillan Press, 1999).
- ¹⁹ Haddadin, *Diplomacy on the Jordan*.
- ²⁰ See Medzini, *The River Jordan* and A. T. Wolf, “Hydrostrategic Territory in the Jordan Basin: Water, War and Arab-Israeli Peace Negotiations,” in *Water in the Middle East: a Geography of Peace*, eds. A. A. Amery and A. T. Wolf (Austin, TX: University of Texas Press, 2000).
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