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Environmental Politics

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title-content=t713635072>

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Online Publication Date: 01 September 2000

To cite this Article Dolatyar, Mostafa and Gray, Tim S.(2000)'The politics of water scarcity in the Middle East',Environmental Politics,9:3,65 — 88

To link to this Article: DOI: 10.1080/09644010008414538

URL: <http://dx.doi.org/10.1080/09644010008414538>

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The Politics of Water Scarcity in the Middle East

MOSTAFA DOLATYAR and TIM S. GRAY

In the current debate over the politics of water in the Middle East, there are three main questions at issue. First, has water scarcity caused war in the past? On this question, most, but not all, writers answer 'yes': we argue 'no'. Second, will water scarcity cause war in the future? On this question, opinion is more evenly divided. Many writers, especially in the 1970s and 1980s, have answered 'yes'. But many others, especially in more recent years, have answered 'no' for three main reasons; 'virtual' water, desalination and water pricing. Our answer is 'no', but for a deeper reason than the above three explanations. In our view, the reason why water scarcity will not cause war in the future is because water is too precious to risk by going to war. Third, will water diplomacy assist peace negotiations? Most writers answer 'no'; our answer is 'quite possibly, yes'. In our discussion of these three questions we adopt the theoretical framework provided by the environmental security debate, and we consider three cases; water politics in the Jordan River basin, the Euphrates-Tigris basin, and the Arabian Peninsula. Our overall conclusion is that water scarcity has served more to reinforce peace than to provoke war, and that it is likely to continue to do so in the future.

Three Contested Issues of Water Scarcity in the Middle East

During the last 40 years there has been considerable speculation about the security implications of water scarcity in the Middle East. Three distinct questions have emerged from this speculation. The first question is whether or not water scarcity has been the cause of war between states. On this question most writers have argued in the affirmative – pointing to examples of 'water wars' such as the Six Day War between Israel and the Arabs in 1967. For instance, Cooley [1984: 22] wrote that 'The constant struggle for waters of the Jordan ... was a principal cause of the 1967 Arab– Israeli War'. Similar statements have been made by (among others) Naff and Matson [1984: 44]; Bulloch and Darwish [1993]; Naff [1994: 280]; and Amery [1997: 95, 99–100]. Shaheen [1997: 63] quotes David Ben Gurion,

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Environmental Politics, Vol.9, No.3, Autumn 2000, pp.65–88
PUBLISHED BY FRANK CASS, LONDON

Israeli's first Prime Minister, as stating that 'Israeli's wars in the region are water wars'.

However, in the view of a minority of commentators, including us, these writers are mistaken: the evidence does not support the view that water scarcity has caused wars in the Middle East. Water scarcity may have been used as a pretext for war by combatant sides (part of the political rhetoric); water installation may have been targeted by warring armies; water conflict may even have served as an occasion or flash point for war – but in none of these instances has water scarcity been the (fundamental) cause of war. At most, water conflict could be regarded as a contributory factor in rising tension, but in the absence of the fundamental cause, there would have been no war. For example, in the dispute between Israel and the Arabs [*Elmusa, 1996: 71*], the fundamental issue was land, as Shaheen [*1997: 209–10, 237*] states:

land and not water is the core issue of conflict. The Palestinians are conscious of their weak position as a negotiating partner, and used water as a back door tactic to gain control of land. Israel, on the other side, used water as a means to secure a political settlement with the Palestinians ... water resources ... were not the major factor ... The loss of Palestine to Zionism ... was the essence of the conflict.

Commentators have taken too literally the 'rhetorical pronouncements made by Arabs and Israelis' [*Shaheen 1997: 64*].

The second question at issue is whether or not water scarcity will cause war in the future. On this issue, opinion is more evenly divided. Several politicians and officials and many writers have argued that water wars are very likely in the future. Of the politicians, Egyptian President Anwar Sadat, just after signing the peace treaty with Israel in 1979 said that 'the only matter that could take Egypt to war again is water' (quoted in Sherman [*1999: 51*]). Of the officials, Sherman [*1999: 54*] quotes Professor Dan Zaslavsky of the Faculty of Agricultural Engineering at the Israel Institute of Technology, a former Israeli Water Commissioner, saying in 1991 that 'The past wars over water are liable to be a pale shadow of future wars over water.' The most recent expression of the future water wars hypothesis from an official has come from Hans van Ginkel, UN Under Secretary General, who stated in March 1999 that 'Conflicts over water, both international and civil wars, threaten to become a key part of the 21st century landscape' (*Financial Times*, 15 March 1999, p.4).

Of the writers who enunciate the future water wars hypothesis, one of the earliest doom-laden predictions comes from Naff and Matson [*1984: 3*] who maintain that 'water-generated' conflicts could engulf the entire

Middle Eastern region. More recently, Starr [1991: 17, 19], after revealing that during the mid 1980s, American intelligence services estimated that 'there were at least ten places in the world where war could break out over dwindling shared water – the majority in the Middle East' – predicts that in the Middle East, 'water security soon will rank with military security in the war rooms of defence ministries'. And claims such as that by Kliot [1994: v] that 'water, not oil, threatens the renewal of military conflicts and social and economic disruption in the region', have often been made by observers during the last twenty years.¹ Indeed, the hydropolitics literature is replete with assertions like Bulloch and Darwish's [1993: 199] that 'Water wars are on the way,' and Butler's [1995: 35] that 'nowhere is the potential for a water war greater than in the Middle East' [e.g., Musallam, 1990; Postel, 1992; Bulloch, 1993; Starr, 1993; Hillel, 1994; Lonergan, 1997]. Moreover, Sherman [1999: 48] claims there is a 'widely pervasive consensus' among observers about the 'potential for violent conflict', and he himself clearly shares this consensus view: 'water is indeed an inflammatory issue in the Israeli–Arab conflict' [1999: 58].

However, many writers nowadays take a more optimistic view, arguing that for one or other reason, water wars are unlikely in the Middle East. Deudney [1991: 26] was the first to advance this argument, suggesting that mutual vulnerability of the interruption of water supplies would make war *less*, rather than *more*, likely. Similar views have been expressed by Elhance [1995], Dellapenna [1995] and Wolf [1995, 1997]. Alam [1998] has called this hypothesis 'water rationality'. Our interpretation is broadly in line with this more optimistic view. We argue that water scarcity creates a mutual hostage situation between riparian states of shared water basins, and this leads such states to avoid conflict by pursuing mutually beneficial solutions to the problems. In other words, water is too vital a resource to be put at risk by war; increasing water scarcity generally concentrates the minds of decision-makers to find sustainable solutions by means of co-ordinated, co-operative and conciliatory arrangements. Shapland [1997: 101] gives an apposite illustration of this interpretation: 'The accords signed by Ethiopia and Sudan in 1991 and by Ethiopia and Egypt in 1993 ... suggest that discussion and negotiation are more likely than war ... these agreements seem to be informed by a realisation on the part of both upstream and downstream states that the costs of conflict are too great to be borne'. These states are 'driven towards co-operation by a hard-headed assessment of their own self-interest' [Shapland 1997: 102].

Our interpretation differs, however, from the three leading explanatory theories put forward by these optimists; two supply side theories: 'virtual' water, and desalination; and one demand side theory: water pricing. Tony Allan is the most prominent advocate of the 'virtual' water theory. He

argues that the reason why Middle Eastern states will not go to war over water is that they can solve their water scarcity problems by importing agricultural produce and thereby eliminating the need for the irrigation of domestic agricultural production. According to Allan and his co-authors, the risk of water wars in the Middle East is small because of the growth of international trade, through which water-rich countries export water-dependent products (such as food staples) to water-poor countries, thereby drastically reducing the pressure on the latter's scarce water resources [Allan and Karshenas, 1996: 121].

The water-deficient economies of the Middle East have a very economically sound means of access to very large volumes of 'virtual' water by means of world trade... Despite the implicit tension in the water deficits of the countries of the region, which many predicted would be decisively destabilising, the region has not faced tension over water since 1970 because water has proved to be otherwise available in the world for food staples [Allan and Mallat, 1995: 3, 2].

However, we reject this argument on grounds that while it rightly shows that food imports can help to *alleviate* the water shortage, they cannot *end* it, because of the deep-rooted commitment in many Middle Eastern countries (including Israel) to a high degree of self-sufficiency in food production. There are five reasons for this commitment. The first reason is food security. No Middle Eastern country is prepared to become completely dependent on other countries for its food supply, since that would make it highly vulnerable, both financially (subject to the vagaries of world trade) and physically (exposed to attacks on vital supply routes). Shapland [1997: 97] notes that a degree of food self-sufficiency is regarded by Middle Eastern states as a matter of 'national security.' As Nachmani [1997: 73, 81] rhetorically remarks, 'Would Middle Easterners who gained their independence from the colonial powers during the last 50 to 60 years agree to depend on food prescribed outside the Middle East? ... dependence is a dirty word in the region.'

The second reason is border security. Israel has historically viewed agricultural settlements near her borders with her Arab neighbours as an important element in her security policy. As the old adage put it, 'If we don't go to the borders, the borders will come to us'. Although it may be true, as Shapland [1997: 51] notes, that 'In an age of ballistic missiles and nuclear weapons, the distribution of population has little to do with the defence of the state', nevertheless, there is a residual psychological importance of border settlements in Israel's security policy thinking [Shaheen 1997: 204].

The third reason is ideology. Like many other countries, Israel's conception of itself entails a sense of identification with the land. As Shapland [1997: 51] notes: 'For Israel, agriculture (and therefore irrigation) was fundamental to Zionist ideology, as representing redemption of the land and rootedness in it.' Although it is true that this factor is less important nowadays – 'Questioning the ideological aspects of agriculture is no longer regarded as heresy' – nevertheless, 'a strong agricultural lobby has developed and entrenched itself in the institutions of government' [Shapland, 1997: 51].

The fourth reason is balance of payments. Importing all of their staple foodstuffs would impose an intolerable burden on the balance of payments and foreign currency reserves of most Middle Eastern countries.

The fifth reason is rural employment. Although only six per cent of the Israeli workforce is engaged in agriculture, up to 40–50 per cent of the workforce in other Middle Eastern states work on the land. Moreover, in the case of Egypt, agricultural employment 'is a means of demonstrating that the government has an answer to population growth and overcrowding in the cities' [Shapland, 1997: 97].

The 'virtual' water theory, then, is not a convincing explanation of why there will be no future water wars in the Middle East. This is not to deny, however, the value of the theory in indicating one important way in which some of the pressure can be, and is being, taken off water scarcity. All that we are arguing is that it will not *in itself* solve the problem of water conflict.

The second of the three leading theories put forward by the optimists is that of desalination. Like 'virtual' water, desalination is a supply side solution – seeking to eliminate water conflict in the Middle East by augmenting supply. This view is advanced (among others) by Nachmani [1997: 88] who rejects the notion that water disputes in the Middle East can be resolved by negotiation, since the basic problem is that there is just not enough water in the region. 'Even if cooperation were politically feasible, water supplies still are insufficient to meet the region's rapidly growing needs. Peaceful and negotiated resolution of Middle East water conflicts will not generate additional water.' Hence Nachmani [1997: 84] concludes that desalination is 'The only realistic hope ... Investing in desalinization of brackish water or sea water ... is cheaper than attempts to settle disputes over available water sources, most of them already overused.' He claims that the entire water needs of Israel, Jordan and the West Bank could be met by an investment of \$2 billion in desalination plants – compared with a cost of \$100 million every day of warfare.

However, we reject this argument on grounds that while desalination is obviously preferable to water wars, and while it can undoubtedly relieve much water scarcity, it cannot be seen as a complete solution, since

desalination plants constitute prime targets for hostile military and terrorist strikes, and they pose serious environmental problems – in both their energy requirements and the disposal of their highly concentrated saline waste products [*Sherman, 1999: 68*]. A definitive reason for optimism about permanent water peace requires a deeper foundation than the technological solution offered by desalination.²

The third leading theory of the optimists is water pricing. Unlike the two previous theories, which operate on the supply side, water pricing is a form of demand management, and serves to curb wasteful use of water by imposing financial restrictions on its consumption. James Winpenny is a strong advocate of this theory, and he claims that the heart of the problem is the failure to see water as an economic commodity to be distributed according to market forces rather than as a public service to be supplied to meet consumer's needs, with cost a secondary consideration. As a result, water is seriously underpriced compared to its real cost of supply, and is therefore often wasted. Winpenny [*1994: 9*] claims that use of the market could solve the problem of scarcity by including the real costs (including environmental costs) of water supply in its price. This would inject a sense of urgency into efforts to eliminate the vast loss of water through leakage, evaporation and run-off, especially in agriculture (world-wide irrigation efficiency is estimated to average less than 40 per cent, according to Postel [*1992: 100*]) and industry. For example, if a tariff system led to a ten per cent reduction in agricultural consumption of water, it would double the supply of water for domestic use [*Postel, 1992: 99*].

However, while some form of water pricing could clearly help reduce wastage of scarce water resources, it cannot be regarded as in itself a definitive or complete solution to water conflict. As Shaheen [*1997: 183*] notes, water pricing would entail 'a high cost in terms of social and political instability as the livelihood of farming communities might be undermined.' Many farmers in Syria, Lebanon, Jordan and Israel would be unable to pay the higher water charges for irrigation. 'The social consequences of introducing a market economy to regulate water supply and manage its demand would ... [risk] turning the water dispute from being a potential conflict issue between Israel and its neighbours into a source of national discontent' [*Shaheen, 1997: 202*].

Thus none of the three leading theories of the optimists offers a convincing reason why there will be no water wars in the Middle East in the future. While each of their prescriptions will help to alleviate water scarcity (indeed to some extent they already do so) a more compelling explanation is required to demonstrate why Middle Eastern states will not go to war over water. This deeper explanation is that water is too precious to fight over.

The third main question at issue is whether or not a solution to water conflicts will help to move forward peace processes in general. On this question, some writers answer 'yes', but most answer 'no'. Among those answering 'yes', Ben Shahr claims that 'A regional water plan need not await the achievement of peace. To the contrary, its preparation, before a comprehensive peace settlement is attained, could help clarify objectives to be aimed for in achieving peace' (quoted in Sherman [1999: 85]). And Hillel [1994: 283] asserts that 'Water can catalyse and lubricate the peace process ... and soften the transition to regional co-operation.'

Those writers answering 'no', argue that the linkage is in the opposite direction – that a solution to the problem of water scarcity presupposes a solution to the wider problem of peace between states in the region. Among those answering 'no', Sherman [1999: 85] dismisses the views of Ben Shahr and Hillel as 'unfounded optimism and potentially hazardous naivety', because they fail to understand that until and unless a genuine peace settlement is concluded, no water solution is possible. Shaheen [1997: 210] claims that since 'water was not the cause of the conflict, therefore, it is unlikely to be an effective cause for peace.' This is why, 'despite the importance of water as a component issue in Arab–Israeli relations, it has not contributed to the advancement of peace, particularly between Israel and the Palestines' [Shaheen, 1997: 224]. For example, Jordan delayed signing a peace deal with Israel (in which arrangements were made for sharing the Litani and Yarmouk rivers) until 1994, one year after the Palestines had concluded their peace deal with Israel – thus indicating that water settlements follow, rather than precede, general moves towards peace in the region.

However, our view is that water diplomacy could help to break the deadlock in at least some of the peace negotiations currently being conducted. Hillel [1994: 287] speculates along these lines: 'a dispute over water need not lead to violent conflict. Rather than fester as a *casus belli*, it may well serve as a *casus paci*, an inducement to negotiate, a non-violent resolution through compromise and co-operation'. Moreover, we argue that a solution to the problem of water scarcity may be achieved independently of a solution being obtained to the wider problem of peace in the region.

In the three case studies that follow, we attempt to substantiate our arguments on each of the above three issues. But first, we set out the theoretical framework which informs our interpretation.

The Theoretical Context

The theoretical context in which this article is situated is the debate that has taken place during the 1980s and 1990s in international relations theory

over the issue of 'environmental security' [Soroos, 1994]. This is a debate between those writers who claim that there is a linkage between environmental issues and security concerns, and those writers who reject such a linkage. The writers who claim there is a linkage, may be divided into two camps – the 'traditionalists' and the 'holists' [Dabelko and Simmons, 1997]. The *traditionalists* argue that problems such as environmental degradation and resource depletion have security implications in that they can lead to political strife and even violent conflict within and between states [Westing, 1986; GliECK, 1991; Molvaer, 1991; Homer-Dixon, 1991, 1994]. For traditionalists, 'the environmental dimension is simply absorbed into an enlarged definition of security' [Imber, 1991: 205]. On this view, wars will periodically occur between states which are faced by increasing scarcity of shared water sources.

The *holists* argue that the linkage between the environment and security is much more profound than the state-centric traditionalists conceive, requiring a new *genus* of security [Imber, 1991: 205]. On the holistic view, security must be redefined to embrace global environmental threats such as ozone layer depletion and climate change that pose dangers to the well-being of all states and all peoples on earth [Ullman, 1983; Mathews, 1989; Brown, 1986; Mische, 1989; Renner, 1989; Dalby, 1992, 1998; Gore, 1992; Myers, 1993]. Coping with such threats requires raising global consciousness about their seriousness, and creating global institutions such as international environmental regimes to exert pressure on states to take collective action. On this view, water scarcity is a global security problem, demanding a global response. Until this response is in place, armed conflict over water could occur anywhere in the world.

However, as Dabelko and Simmons [1997] point out, neither traditionalists nor holists offer a wholly satisfactory framework for an understanding of the issue of water scarcity. The *traditionalist* view has two weaknesses. First there is little convincing evidence to support claims that water wars have actually occurred. Second, it ignores the substantial amount of evidence that 'shared environmental problems may prompt collective action, thereby generating goodwill and trust among disputing groups' [Dabelko and Simmons, 1997: 134]. In the case of water scarcity, there are countless sets of inter-state agreements between neighbouring states on the use of shared water resources.

The *holistic* view also has two weaknesses. First, it has been dismissed as 'analytically misleading' [Deudney, 1990: 461] and 'muddled thinking' [Deudney, 1991]. By extending the notion of 'security' into every area of environmental concern (every environmental problem is a

security threat) the holists have diluted the concept of security into an empty, catch-all category, ignoring its specific and unique characteristics. A security threat signifies an immediate risk of intentional, direct violence; an environmental problem such as water shortage does not. Second, the holistic view contributes to a militarisation of the environment. That is to say, it encourages states to perceive every trans-boundary environmental harm as a security (and therefore serious) threat to its integrity, and serves to legitimise a military response. In the case of water, many trans-boundary tensions exist that could thereby escalate into conflicts between states.

If we turn to the writers who, like us, reject a linkage between the environment and security, they argue that war over water will not occur, because of 'virtual' water (Allan), desalination (Nachmani), or water pricing (Winpenny). As we have already indicated, however, a more important reason for rejecting the link between the environment and security is that there are powerful incentives for neighbouring states to cooperate in resolving water disputes between them; incentives so strong that water disputes are more likely to lead to peace than to war. This is the argument that we develop in what follows.

The remainder of this article has three case studies on water politics, followed by a short conclusion. Case I is the Jordan River basin; Case II is the Euphrates-Tigris basin; and Case III is the Arabian Peninsula.

Case I Water Politics in the Jordan River Basin

Although it is the smallest watershed shared by more than two countries in the Middle East, the Jordan River basin has been the focus of the most intense attention, because of the acute political tension in the area. Moreover, of all the water systems in the Middle East, the Jordan River basin is the one that is most frequently cited as a source of serious conflict and the likeliest to erupt into a water war [Cooley, 1984: 3; Gowers and Walker, 1989: 7; Bulloch and Darwish, 1993: 36; Gleick, 1994: 8; Mastrull, 1995: 36]. The fact is, however, that although political relations between the riparian states in the Jordan River basin have sometimes been adversely affected by disputes over water rights, these disputes have often tended to encourage co-operation rather than conflict. Furthermore, even during periods of bitter hostility between Arabs and Israelis, there has always been a tacit, albeit limited, accommodation over water.

The Jordan River basin comprises Syria, Lebanon, Jordan, Israel and the Occupied Palestinian Territories. Since only about five per cent of the total

water demanded by Syria and Lebanon is taken from the Jordan basin, they have least at stake. Jordan, which has a serious water deficit, and is dangerously over-drawing its underground water resources (aquifers), relies on the River Jordan and its tributary, the River Yarmouk, to satisfy its major water needs. Israel, also acutely short of water, obtains about one third of its total water consumption from the Upper Jordan, and has severely restricted the water use by Palestinians of aquifers underlying the West Bank [Postel, 1992: 76].

Until the early twentieth century, demand for water in the Jordan River basin kept largely in line with its natural supply by a network of local irrigation schemes. But the influx of Jewish immigrants (raising the Jewish population in Palestine from 80,000 in 1914 to 600,000 in 1948 and to over four million in 1998) created severe pressure on water supplies [Naff and Matson, 1984: 30, 32] both in Israel itself, and in Jordan, whose population trebled within two years as a result of the influx of millions of Palestinians who fled or were expelled from the areas of Palestine that fell under Israeli sovereignty [Lowi, 1993: 47].

There are two major sources of water conflict in the Jordan River basin: – the Jordan River itself and the Litani River. First, the Jordan River itself. Not surprisingly, since local water resources were insufficient to meet growing Israeli needs, the only apparent alternative, the Jordan River system, figured significantly in Israel's development plans [Lowi, 1993: 49]. However, the Jordan watershed was shared by four sovereign states (Syria, Lebanon, Jordan and Israel), and because of the ethnocentric hostilities and territorial disputes between them, conflict between Israel and its Arab neighbours seemed inevitable.

The Arab response to Israeli development plans was twofold. On the one hand, the Palestinian National Liberation Movement (Al-Fatah) used military action against the Israeli National Water Carrier³ [Zarour and Isaac, 1993: 41]. On the other hand, the Arab League determined to help Syria, Lebanon and Jordan to divert the head waters of the Jordan River. Israel responded to this twofold threat by military attacks on the Syrian construction sites, and a series of skirmishes occurred which, according to many observers, eventually led to war in June 1967. Ariel Sharon, later Israel's defence minister, explained that 'people generally regard 5th June 1967 as the day the Six-Day War began, that is, the official date. But in reality, it started two and a half years earlier, on the day Israel decided to act against the diversion of the Jordan' [Bulloch, 1993: 12]. Morris [1997: 7] states that 'Israel's search for water security can be considered one of the principal causes of the 1967 war.' Shaheen [1997: 63] quotes a UN truce supervisor in the demilitarised zone, General Odd Bull, referring to the 1967

war as 'a war for the control of water resources'. Cooley [1984: 3] claims that 'the constant struggle for the waters of the Jordan ... Yarmouk and other life-giving Middle East rivers ... was a principal cause of the 1967 Arab-Israeli war.'

Second, the Litani river. As water demand in Israel rose in line with its expanding population, it was clear by the early 1980s that reclamation of the Negev desert could not be achieved without additional water resources. Given the high costs of desalination and the pollution of surface and ground waters, Israel needed other natural supplies of water, and Lebanon was a neighbouring country with surplus water resources. When in 1978 and 1982 Israel invaded Lebanon, although the officially announced reason was military security, for some commentators, such as Hewedy [1989: 23], the real reason was water security: 'the broader incentive for the invasion of Lebanon in 1982 was to secure the waters of the Litani river. The avowed objective to protect the northern borders from Palestinian attacks is not convincing to most military observers. Rather, the thrust appears directed at finally seizing control of the Litani River.' Bulloch and Darwish [1993: 37] and Amery [1997: 100] make similar claims. Shaheen [1997: 66] quotes a statement made by a former Egyptian Foreign Minister, Mahmoud Riyadh, that 'the Israeli aggressive invasion of Lebanon in 1982 was not to secure Upper Galilee as is alleged ... The basic aim has been to occupy Southern Lebanon to exploit the Litani waters to meet the growing need for water in Israel.'

Despite appearances to the contrary, however, neither of the two situations of water conflict outlined above supports the notion of water wars. With regard to the Six Day War, first, as Wolf [1997: 6] points out, there was a time-lag of 12 months after the initial Israeli military attacks on Syrian construction sites before the outbreak of war in 1967. Second, as Kliot [1994: 206] argues, so far as Syria was concerned (a country which has a relative sufficiency of water), the diversion plan was essentially a pretext to provoke Israel into military action which would result in massive Arab retaliation. So water was an instrument, not a cause, of the 1967 war. Third, as Shaheen [1997: 230] notes, the Israeli objective was land not water; 'the conflict took place for the control of land which often had no water except in very negligible quantities.' Fourth, even if water played some part in the deepening hostilities, it was only a minor or incidental part [Shapland, 1997: 17]. As Elmusa [1996: 72] affirms, 'Research on the events that culminated in the 1967 war ... reveals that water was not a strong factor, if a factor at all, in the eruption of the war'.

Similarly with the Litani River. As Shaheen [1997: 231] observes, 'With regard to the Israeli invasions of Lebanon in 1978 and 1982, water resources were not the underlying objective.' The main aim was to destroy the PLO

and establish a 10km buffer zone between the PLO bases and Israel. Kliot [1994: 199] points out that water transfers from the Litani River by Israel were 'very small,' and 'reflect the core of Israeli's policy of intervention in Lebanon which focuses on security for Northern Israel – not on a desire for water'. Alam [1998: 6] notes how interviews with Israeli generals confirm that water was not a major consideration.

Accordingly, we agree with Wolf's [1995: 80] assertion that 'water resources were not a factor in Israeli strategic planning in the hostilities of 1967, 1978 or 1982 ... the decision to go to war, and strategic decisions made during the fighting (including which territory it was necessary to capture), were not influenced by water scarcity or the location of water resources'. In each case, water scarcity was either the occasion, rather than the cause, of conflict, or it was, at most, an additional or secondary cause, not the primary cause, of conflict. The real cause, as Libiszewski points out, was the deep rooted antagonism between Israel and its Arab neighbours. Rejecting the 'hydraulic imperative' analyses of the Israeli invasions of 1967 and 1982 as 'too simplistic', Libiszewski rightly argues that the Arab-Israeli conflict 'was triggered by the endeavour of Zionism to build a Jewish state on the land of their historical ancestors, and by the rejection of it by the indigenous Palestinian population and the neighbouring Arab states'. Hence, disputes over water 'were rather an outflow of political and territorial conflict than part of its origin ... water has been included in the dynamic of conflict mainly as an intervening variable, rather than as a catalyst in itself' [Libiszewski, 1995: 91–5].

As for the future of water conflict in the Jordan River basin, there is a growing consensus in the peace process that, stalled though it seems on some issues, on the water issue there is no alternative to co-operation. Shimon Peres expresses this consensus when he declares that 'the water shortage proves the objective necessity of establishing a regional system ... like all wars in the political and strategic reality of our times, wars fought over water do not solve anything. Gunfire will not drill wells to irrigate the thirsty land, and after the dust has settled, the original problem remains. No war can change geographical givens' [Peres with Naor, 1993: 127]. Furthermore, as Dellapenna [1995] claims, there is a possibility that water may even become the key to building peace in the region if the opportunity to collaborate over water resources is properly seized.⁴

Case II Water Politics in the Euphrates-Tigris Basin

Next to the Jordan River basin, the flash-point where water wars are alleged by commentators to be most likely in the Middle East is the Euphrates-Tigris basin [Starr, 1991: 31; Postel, 1992: 80; Bulloch and Darwish, 1993:

16, 24–5, 31–2; Joffe, 1993: 76, 83; Hillel, 1994: 103, 110; Barham, 1996: 3]. For example, Hillel [1994: 110] claims that 'conflict over water will be more than likely between Syria and Iraq, or possibly both and Turkey'. It is true, however, that some writers take a different view. Postel [1992: 74], for instance, is equivocal, arguing that water scarcity in this basin 'will foster either an unprecedented degree of co-operation or a combustible level of conflict'. Gleick [1994: 6] is cautiously optimistic, suggesting that 'the need to manage jointly the shared water resources of the region may provide an unprecedented opportunity to move toward an era of co-operation and peace'. Kolars and Mitchell [1991: 297] are positively upbeat, suggesting that 'it is quite conceivable that we will see in our lifetime a Pax Aquarum in this part of the Middle East, one in which Turkey will play an important role'.

In this section, in support of the views of Gleick and Kolars and Mitchell, we argue that conflictual representations of hydro-politics in the Euphrates-Tigris basin are unconvincing. The fact is, that co-operation over the control and use of water resources has been the prevailing feature of water management policy in the Euphrates-Tigris basin from antiquity, a feature which led Karl Wittfogel [1956] to characterise the communities there as 'hydraulic civilisations'. Although water has sometimes been used as a defensive barrier or a destructive weapon, water-induced conflicts have never occurred in this basin.⁵

The Euphrates-Tigris basin comprises three countries – Turkey, Syria and Iraq. From the end of the Ottoman Empire in 1918, after which the new states of Syria and Iraq were created, until 1975, there was little or no friction between the three states over water usage of the Euphrates-Tigris basin [Kliot 1994: 161]. Indeed, the three parties pursued a co-operative policy to establish principles of water management to protect the interests of both downstream and upstream states. The reason why the situation changed was that in the 1960s all three countries put forward ambitious plans to develop their water resources to expand their hydropower and agricultural outputs. Turkey's need for electric energy led to the first project – construction of the Keban Dam on the Euphrates, begun in 1964. This was followed by a massive water management scheme known by its Turkish acronym GAP (Güneydogu Anadolu Projesi) that involved constructing 22 dams and 19 hydroelectric plants on the Euphrates and the Tigris, together with several diversions, and the extension of irrigated agriculture in the south-eastern part of Turkey.

The GAP Master Plan rang alarm bells in both Syria and Iraq, who viewed such upstream development by Turkey with concern, and they took precautionary measures to safeguard their access to water resources, embarking on their own national water development plans with the aim of

increasing their strategic capacity by impounding the river's water in gigantic reservoirs. Such a large build-up of storage capacity, which is far beyond the actual needs of the three riparian states, is widely tipped as a key factor that would intensify competition and conflict among the parties [*Kliot, 1994: 12*]. Starr [*1991: 31*] claims that 'Unilateral construction of new dams could lead to escalating disputes and armed confrontation.' Chalabi and Majzoub [*1995: 198*] refer to the construction of separate hydraulic projects in the three countries as 'the battle for water in the Middle East.' Postel [*1992: 80*] argues that 'the failure of the basin's three countries – Iraq, Syria and Turkey – to reach water-sharing agreements has created an atmosphere of competition and mistrust that could breed future conflict'.

By way of retaliation against Turkey, Syria and Iraq mounted a campaign to impose an international financial blockade on the GAP. Since the GAP was too costly to be financed solely by the Turkish government, Turkey sought funds from international bodies, principally the World Bank. But Syria and Iraq won backing from the World Bank, the Arab League, the oil-rich countries of the Persian Gulf, and other international lending institutions, not to finance the GAP project. As a result, Turkey had to bear the huge cost of the GAP out of its own hard-pressed budget, at a time of high inflation and rising unemployment [*Bulloch and Darwish, 1993: 65*].

A more direct threat to Turkey was Syria's support for the Kurdish guerrillas of the Kurdistan Workers' Party (PKK), thereby igniting a rebellion that became Turkey's biggest domestic security problem, tying up the Turkish army in the region and putting even more pressure on its already drained national budget [*Bulloch, 1993: 12; Barham, 1994: 8, 1995: 2*].

However, the fact is that the underlying causes of the above conflict between the three states are far removed from the use of water. As Gleick [*1994: 13*] points out, there have been serious tensions between the three states over the past 30 years, including Iraqi/Syrian opposition to Turkey's membership of NATO, and Turkish/Syrian opposition to Iraq during the Persian Gulf War. Moreover, as Lowi [*1995: 138*] notes, 'the Ba'athi rulers in Syria and Iraq have been engaged in a highly acrimonious, personalistic conflict since 1968'. Advocating a policy of socialism and Arab nationalism, the ruling elites of this faction-riven party began to watch each other and Turkey with suspicion. Part of this tension was caused by cold war factors – described by Chalabi and Majzoub [*1995: 197*] – greatly exacerbating the complex tensions for regional leadership and domestic stability that plagued the area.

These factors indicate that the so-called water conflict in the Euphrates-Tigris basin is not an autonomous issue, but is the result of numerous causes which have nothing to do with 'water scarcity' in the proper sense of the term. If these countries are at odds with each other for reasons other than

water scarcity, such as territorial disputes or specific internal problems which can be aggravated or ameliorated by external influences, as Gleick and Lowi suggest, or because the region is divided into competitive domains which are subordinate to antagonistic superpowers in a bipolar or multipolar world order, as Chalabi and Majzoub claim, we cannot argue that the lack of co-operation between the riparian countries in their hydro-politics policies is a direct result of water shortages in the region.

Moreover, we must not overlook the fact that, despite some provocative rhetorical statements by some political actors in the region, and their sensationalist coverage by Western journalists, the most important water projects on the Euphrates-Tigris rivers were carried out peacefully during the 1970s and 1980s, compared with which, those that are still under construction are of far less significance. Also it should be noted that the overall process of water resources development in the Euphrates-Tigris Basin during the last three decades has been in accordance with established agreements between the riparian countries concerning flood control and the regulation of river flow, which were the main concern of the downstream states. For example, in 1987, Turgut Ozal, Turkish Prime Minister, visited Damascus and signed a security protocol with Syria, promising to maintain the Euphrates flow at 500 cm/s at the Syrian border. In 1994, a further agreement was signed by the Turkish and Syrian heads of state, whereby Turkey agreed to supply Syria's water requirements in return for Syria's co-operation on the Kurdish problem [*Starr, 1995: 137*].

To sum up, contrary to the situation in the Jordan River basin, there has been no military conflict between the three riparian states of the Euphrates-Tigris basin and no violent water conflict has marked their relationship. Indeed, the three parties have been engaged in a continuous and active, if at times, fraught, dialogue over water issues since the early 1960s. And bilateral agreements have been concluded between Turkey and Syria and between Syria and Iraq, whereby Turkey is committed to send no less than 16 bcm/yr of water downstream, and Syria and Iraq have agreed that Syria will receive 42 per cent and Iraq 58 per cent of the water available in the Euphrates [*Bakour and Kolars, 1994: 139; Kliot, 1994: 149; Shapland, 1995: 305*].

As for the future, four factors militate against the outbreak of water conflict in the Euphrates-Tigris basin. First, the foreseeable water demand of all three riparian countries is likely to be less than originally projected, partly because they have fallen short of their targets for land reclamation projects and therefore need less irrigation water, and partly because even more than they need irrigation water, both upstream and downstream countries want to maintain a healthy flow of the Euphrates' waters for hydropower as a cheap and non-depleting source of energy. Second, all

three countries are introducing more efficient patterns of water utilisation and new water saving irrigation techniques, not only to save water but also to increase crop yield. Third, consultations are continuing among the riparian states under the auspices of the Joint Technical Committee for Regional Waters – a body established in 1980 that, according to Kliot [1994: 162], reflects a co-operative trend among the three countries and has evolved into an effective organisation for dealing with water issues that arise before they reach a point of conflict. Fourth, partly as a result of the UN Convention on the Law of the Non-navigational Uses of International Watercourses, the parties have come to recognise that they have to shift their water disputes from contests of power to considerations of fair rights and mutual obligations.

Accordingly, we agree with Shapland [1997: 143] in his judgement that although 'in regions where water is short, the desire for sovereign control of water is so fundamental as to be described as atavistic', and although future relations between Turkey and Iraq and Syria are likely to be characterised by 'long-standing mutual suspicions' leading to 'accusations and counter-accusations between the downstream states on one side and Turkey on the other, and poor or tense relations, with the water issue being exacerbated by other disputes', nevertheless, 'armed conflict is unlikely to break out'.

Case III Water Politics in the Arabian Peninsula

Anderson [1991: 11] claims that 'the Arabian Peninsula, with a projected annual rainfall of one third the accepted minimum, is an area where conflict over water is likely to arise' [cf. Hillel, 1994: 275]. Similarly, Joffe [1993: 65] predicts that 'during the next decade, water supply may prove to be the region's most politically divisive issue'. However, although it is true that this hyper-arid part of the Middle East is the most water-poor region of the world, with the highest population and urbanisation growth rates, it is also true that there has been little anxiety among neighbouring states about water conflict, and that there has been no incident that could be defined as an example of a 'water war'. Moreover, the Persian Gulf War of 1990-91 demonstrated that, contra Starr and Stoll [1988: 1], oil remains the dominant strategic resource of the Middle East, overshadowing all other natural resource problems in the region.

The Arabian Peninsula, which comprises Saudi Arabia, Kuwait, Bahrain, Oman, Qatar, United Arab Emirates and Yemen, unlike the other two water basins, has no rivers or lakes. Its severe desert environment relies upon water raised from shallow renewable aquifers and fossil non-renewable aquifers. In the long term, commentators believe that the latter may disappear altogether [Postel, 1992: 31]; in the short to medium term,

critics argue that overdrawing on both types of aquifer will lead to tension between the peninsular states [Anderson, 1991: 11; Hillel, 1994: 275].

However, the history of the area demonstrates that the traditional response to water scarcity is not conflict but co-operation. From time immemorial, the Bedouin tribes, who suffered from years of drought, developed a set of customary rules to control water resources for collective ends. These rules reflected a sense of communal responsibility for water conservation. With the advent of Islam, an evolving set of religious regulations complemented these customary rules, and accomplished what even sceptical observers such as Bulloch and Darwish [1993: 161] and Hillel [1994: 267] acknowledge as a successful system for the peaceful sharing of water resources that lasted for centuries.

However, by the mid-twentieth century, despite their efficiency and sustainability, these traditional methods of water management could no longer satisfy the ever increasing water demands in the Arabian Peninsula. The discovery of oil in the 1930s transformed the Peninsula from an impoverished region of small principalities to an area of affluent Emirates and kingdoms with the highest per capita incomes in the world outside the Organisation for Economic Co-operation and Development (OECD). Among the consequences of this transformation were rapid population growth and urbanisation, increased pollution, and a breach with traditional values leading to extravagant and unsustainable use of natural resources – all of which exacerbated the problem of water scarcity. Increased population is the most crucial factor – mainly through immigration of workers attracted by the oil boom; in Saudi Arabia, for example, the population rose from 3.4 million in 1950 to over 20 million today.

These pressures also exacerbated the problem of food shortages, forcing the Peninsula to increase its food imports. By the early 1990s, excluding Iran, more than 90 per cent of the Persian Gulf's food requirements were imported [Starr, 1995: 59]. However, this heavy reliance upon food imports alarmed governments in the area, not only because it drained away national financial reserves, but also because it was a source of instability and insecurity [Mahdi, 1996: 6]. Consequently, despite severely limited opportunities for agricultural expansion, all the Peninsula's countries adopted a policy of food self-sufficiency. Interpreting *food security* as *food self-sufficiency*, farming in the post-oil era of the Peninsula was given the highest priority, thereby draining off scarce water resources in the area.

These factors resulted in increasing water deficits throughout the Peninsula. Saudi Arabia for example, is reported by Butler [1995: 38] to have pumped out some of its aquifers at 100 times the sustainable level. However, the inadequacy of natural water resources in both quantity and

quality did not provoke hostility and conflict among the neighbouring states in the Arabian Peninsula. Instead, it led them to invest heavily in desalination plants; to undertake demand management; and to cooperate in sharing water resources.

First, desalination; more than a third of the world's desalinated capacity is located in the littoral countries of the Persian Gulf, particularly in Saudi Arabia, Kuwait and the United Arab Emirates [Al-Alawi and Abdulrazzak, 1994: 183]. Defenders of desalination argue that for Peninsula states, it is the only reliable alternative to depleting aquifers, and that as an unlimited source, it could meet the water needs of the Peninsula (and the rest of the world) indefinitely [Temperley, 1992: 27], thereby removing any sense of water insecurity and eliminating all likelihood of water conflict in the area.

However, critics of desalination have attacked it on economic, environmental and security grounds. On economic grounds, desalination is very costly. Only in oil-rich countries is it feasible, where oil revenues provide both the necessary capital for initial investment, and a readily available source of cheap energy to drive the desalination plants. But as a long term solution it is not economic even in these countries, since the oil will eventually run out, as Postel [1992: 47] notes. From an environmental perspective, desalination is criticised because its high energy use runs counter to the goals of reducing air pollution, acid rain, greenhouse gas emission and fossil fuel depletion [Starr, 1995: 191]. Also desalination creates a serious problem of saline waste disposal. The security problem is that desalination plants are extremely vulnerable to both accidental and intentional damage. During the Iran–Iraq War (1980–88), for example, the huge oil slicks in the Persian Gulf seriously damaged the inlets of many desalination plants – only a trace of oil is needed to close a plant down for a significant period [Musallam, 1990: 15]. And during the Persian Gulf War (1990–91), the retreating Iraqi army destroyed most of Kuwait's extensive oil and desalination installations, and pumped vast quantities of oil into the sea to contaminate desalination plants which provided water for the coalition forces and the population centres in the Peninsula [Warner, 1991: 7; Lemonick, 1991: 40; Lacayo, 1991: 32; Gleick, 1994: 15].

The second way in which the Peninsula states are seeking to deal with their water deficits is by demand management – that is, cutting water consumption [Ahmed, 1996: 1]. For instance, in Saudi Arabia, a nationwide campaign was launched in 1997 'to get the 18 million people living in the desert state to cut profligate water use'. King Fahd himself urged citizens to save water as 'a religious as well as a national and development duty' [Gosh, 1997]. Even more importantly, a target was earlier set to reduce the rate of water consumption in agriculture by 2.2 per cent per

annum, and to reduce subsidies on agricultural production [Ahmad, 1996: 4]. As a result of these new policies, production of wheat decreased by 1.3 million tonnes in 1996–97.

Third, the Peninsula states have cooperated in sharing water resources. For example, when in 1993 Bahrain faced a critical water crisis because of the alarming depletion of its groundwater resources, this situation not only did not cause a dispute with Saudi Arabia, which shares the same aquifers with Bahrain, but it led to Saudi Arabia helping Bahrain to expand its desalination capacity and thereby avert the crisis. As Wolf [1995: 3] notes: 'the inextricable link between water and politics can be harnessed to help induce ever-increasing co-operation in planning or projects between otherwise hostile riparians, in essence "leading" peace talks'.

In concluding this case study, we make four points. First, that despite the extreme scarcity of natural water supplies in the area, the countries of the Arabian Peninsula have devised solutions to deal with it. Indeed, water scarcity has been the catalyst for co-operation between them. Even after the discovery of oil drastically changed the traditional lifestyle and demographic configuration of the region, putting even greater pressure on water resources, the shared need for optimal management of this vital resource was a source of accord rather than rupture.

Second, that although there have been some minor border disputes over water in the Peninsula, no documented case of violent conflict over water has occurred in the area. This is not to deny that during major conflicts over other issues, water has become a strategic commodity to be denied to an enemy. For example, as Gleick [1994: 15] points out, there were many ways in which the Persian Gulf War involved water; including military strikes on water supply systems. But this does not mean that water conflict was the *cause* of the Persian Gulf War.

Third, that the Persian Gulf War also demonstrates that the hypothesis put forward by Bulloch and Darwish [1993: 161] that 'whoever controls water or its distribution can dominate the Middle East and all its riches' is still far from being true. There is no doubt that, at least in this part of the Middle East, the black gold – oil – is still much more desirable and commanding than the white gold – water. While oil has proved to be capable of provoking regional countries as well as the international community to ignite the fire of war, water has never been a catalyst for war in this region.

Fourth, as Bulloch and Darwish [1993: 195] point out, the lessons of the Persian Gulf War – in particular the vulnerability of desalination plants – are now being learned and acted upon. One of the main precautions that has been seriously contemplated is to cooperate in establishing strategic water reserves, in case desalination is ever again disrupted. Other measures, for

example, to improve demand management, are also under review as we have seen. Finally, the success of these changes in water policy has been facilitated by co-operation between states, such as that between Saudi Arabia and Bahrain.

Conclusion

We believe that the foregoing analysis of water conflict in the Middle East establishes three conclusions – one related to the past and two related to the future. With regard to the past, although the most frequently cited hypothesis in the literature of hydro-politics is that water scarcity has been the cause of conflict and war in the Middle East, we have found that water scarcity has rarely caused armed conflict in the region. As Shapland [1997: 1] notes, although ‘the region has been the scene of half-a-dozen substantial outbreaks of armed conflict since the Second World War ... These conflicts did not break out over water.’ Wolf [1997: 1] points out that this conclusion applies across the globe: ‘only seven skirmishes are found throughout the world; no war has ever been fought over water’. Indeed, although water has sometimes provoked tension and dispute in the Middle East, it has much more often promoted co-existence and co-operation between indigenous communities, and we argue that water scarcity has served as a platform for co-operation in the region, through which all riparian parties have achieved greater gains.

With regard to the future, recent developments in the Middle East indicate that a consensus is emerging in the region which is encouraging countries to manage their water scarcity problems through accommodation and without recourse to conflict. We conclude, therefore, with two claims. First, that even if the water crisis deepens in the Middle East, it is likely that it will continue to be resolved without resort to armed conflict. ‘In the foreseeable future, war between Israel and its Arab neighbours over water seems out of the question’ [Shapland, 1997: 56]. Second, that in certain circumstances, moves towards settlement of water disputes could promote efforts at achieving wider peace objectives.

NOTES

1. According to Nachmani [1997: 69] throughout the world, ‘Gradually, water shortages are replacing oil as a cause for international conflicts’.
2. We are indebted to one of the referees for pointing out that there is a perverse irony in the optimistic arguments advanced by the ‘virtual’ water and desalination theorists. If ‘virtual’ water and/or desalination led to a situation in which Middle Eastern states were water independent of one another, wars could break out, because the bond of water interdependence, which helps to keep the peace, would be severed.

3. The National Water Carrier, completed in 1964, brought water from the northern and central regions through a network of pipes, canals and pumping stations to the country's urban centres and agricultural settlements as far as the Negev Desert.
4. This 'cooperative spillover' effect is more likely in the Jordan River Basin than in either the Euphrates-Tigris Basin or the Arabian Peninsula. (Alam [1998: 263-4] notes that it did not occur in the Indus Basin.)
5. Failure to distinguish between water as a military weapon, and water as a cause of military conflicts, has misled some writers into discovering many water wars in ancient Mesopotamia. For example, Hatami and Gleick [1993] compile a chronology of so-called water conflicts in the ancient Middle-East, most of which occurred in the Euphrates-Tigris Basin. A careful scrutiny of the events listed, however, discloses that none of them is a water conflict in the strict sense of the term. Rather, they are cases in which water was used either as an *offensive* weapon (by Logash, Esarhaddon, Assurbanipal, Nebopolassar, and Cyrus); or as a *defensive* weapon (by Abi-Eshuh, Moses, Hezekiah, and Nebuchadnezzar); or as a *target* of destruction (by Jargon II, Sennacherib, and Alexander). But none of these cases is a genuine water-generated conflict.

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