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42 Water Accords in the Middle East Peace Process: Moving towards Cooperation?

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42.1 Introduction

Given the water scarcity in the Middle East, the Jordan River as well the West Bank Mountain Aquifer are prime examples of internationally shared water resources that hold the potential for conflict. The last century witnessed substantial tension among the riparian states and included skirmishes over water (Wolf/Ross 1992; Reguer 1993; Lowi 1995). Between 1950 and 1990, the U.S. government attempted to mediate a number of water disputes with limited success. By the early 1990's, no water agreements existed between Israel and its neighbours, and the *de facto* water use regime was heavily disputed. During the course of the Middle East peace talks, several agreements were concluded which contain provisions on water, notably the Israeli-Jordanian peace treaty of 1994 and the Interim (Oslo B) Agreement between Israelis and Palestinians of 1995. In addition, in 1996, a trilateral Declaration of Principles for cooperation on water-related matters was signed by Israel, Jordan, and the Palestinian Authority.

This has led to some justification for sanguinity. For instance, Amery and Wolf write in the introduction to their 2000 book:

However, water shortages within Jordan, Israel and Palestine, along with the transboundary nature of some of the sources involved (e.g., the West Bank Mountain Aquifer and the Jordan River), have led to proposed cooperative projects, designed to alleviate the resulting stress, which may emerge as testimonies to the benefits of cooperation and its contribution to greater water security, serving to move the peace process steadily forward (Amery/Wolf 2000: 4).

Is such an optimistic and almost deterministic statement vindicable? How have these agreements altered the water use regime of the Jordan River Basin? And what are their implications for future cooperation in the management of the shared water resources in the region?

This chapter approaches these questions by introducing into the water resources conflict and discourse about management options (Allan, ch. 40), and by reconstructing negotiation positions, the content of the water agreements, and progress in their implementation. It makes clear that there are no easy answers. However, the chapter claims that the design of the water agreements so far is not yet sufficiently conducive towards solving the most pressing water problems of the region, let alone a rational management approach. Despite formalised collaboration at the political and technical level, transboundary water management in the Middle East remains politically contentious, organisationally and technically challenging, and more costly than necessary.¹ The Israeli-Jordanian water agreement has brought slight improvements for Jordan, albeit at a slow pace and below Jordanian expectations. The design of the Interim Agreement between Israelis and Palestinians has so far proved to be too cumbersome to improve the critical water supply situation in the Palestinian Autonomous Areas.

Section 42.2 lays the ground for understanding the distributional conflict about water resources in the Middle East by introducing into the water resources situation of each of the three core parties, Israel, Jordan and the Palestinian Authority (Section 42.2.1), and by discussing dimensions of the Middle East water crisis and possible management responses (Section 42.2.2). Section 42.3 summarises the water negotiations and agreements within the Middle East Peace process. Section 42.3.1 introduces negotiation positions and outlines the architecture of the talks on water. Sections 42.3.2-4 present the content, a brief assessment and progress in the implementation of the Israeli-Jordanian Water Agreement, the Israeli-Palestinian Interim Water Agreement and the Trilateral

1 The author has first introduced this argument in Dombrowsky (2001, in German).

Table 42.1: Near East Water Resources and Withdrawals 1994 (Million Cubic Metres per Year [MCM/yr]). **Source:** Dombrowsky (1998: 94), based on Israeli, Jordanian, and Palestinian data reviewed within the 'Middle East Regional Study on Water Supply and Demand Development (see also GTZ 1998a/b).

	Safe yield	Water withdrawals				
		Israel	Palestine	Jordan	Syria	Total
Jordan River Basin	1320	645	0	350 (incl. wadis)	ca. 200	1195
Mountain Aquifer West Bank, Israel	679	487	121	-	-	608
Coastal Aquifer Israel	240	240	-	-	-	240
Coastal Aquifer Gaza Strip	55	-	108	-	-	108
Other Aquifers Israel	215	283	-	-	-	283
Aquifer Jordan	275	-	-	507	-	507
Total	2784	1655	229	857	ca. 200	2941

Legend: Safe yield refers to estimates of the average renewable amount of water resources. In addition, the region is endowed with non-renewable and fossil groundwater resources.

Declaration of Principles respectively. The water accords are further assessed and interpreted in Section 42.4. Section 42.5 contrasts the water accords with broader visions of cooperation, and assesses the prospects for cooperation. Section 42.6 pulls the different arguments together.

42.2 Competition for Water in the Jordan River Basin

42.2.1 Water Resources, Access and Scarcity

The main surface water system in the Middle East, the Jordan River and its tributary, the Yarmouk River, is shared by Lebanon, Syria, Israel, Jordan and the Palestinians in the West Bank (Figure 42.1). In addition, some of the region's groundwater resources (aquifers) are transboundary as well, such as the Western and the North-eastern Mountain Aquifer which is recharged in the West Bank and flows towards Israel, and the Disi Aquifer, shared by Jordan and Saudi Arabia. Little of Syria's and Lebanon's territory lies within the Jordan River catchment, and these two countries have significant other water resource endowments. For Israel, Palestine and Jordan, however, the Jordan River and the underlying groundwater resources constitute the only indigenous water resources. By the early 1990's, the communities in the region used virtually all renewable water resources,

and several aquifers were even being used beyond their safe yield (Table 42.1).

With an average per capita availability of some 210 cubic metres per capita and year ($\text{m}^3/\text{c}/\text{yr}$; 1994 figures; Dombrowsky 1998: 93), the area of Israel, Palestine and Jordan is one of the most water-scarce regions in the world. As a rule of thumb, an individual requires one $\text{m}^3/\text{c}/\text{yr}$ of drinking water, about 50 to 100 $\text{m}^3/\text{c}/\text{yr}$ of water for domestic purposes, and over 1000 $\text{m}^3/\text{c}/\text{yr}$ of soil water (either from rain or irrigation) for food production (Allan 1995: 58; 2001: 6). This implies that the water economies of Israel, Jordan, and Palestine have merely enough water for domestic and industrial purposes, but that they could never be self-sufficient in agricultural production based on indigenous water resources. While all three riparians suffer from scarcity to a certain degree, water stress is significantly more severe in Jordan and in the Palestinian territories with an average per capita consumption of 220 $\text{m}^3/\text{c}/\text{yr}$ and 110 $\text{m}^3/\text{c}/\text{yr}$ respectively, compared to 360 $\text{m}^3/\text{c}/\text{yr}$ in Israel.² Water stress is exacerbated by natural, demographic and political factors, such as high climatic variability (Bolle

2 Unless indicated otherwise, water use quantities in this chapter are based on Dombrowsky (1998). According to Shuval and Feitelson (2002: 168), estimated per-capita consumption figures for the year 2000 were 270 $\text{m}^3/\text{c}/\text{yr}$ in Israel, 200 $\text{m}^3/\text{c}/\text{yr}$ in Jordan, and about 90 $\text{m}^3/\text{c}/\text{yr}$ for the Palestinians.

Figure 42.1: The Jordan River Basin (1967-2000). Source: Wolf 2000: 91. Printed with permission.



ch. 35; Georgas ch. 36) and susceptibility to droughts (ch. 37-40 above), high population growth (Zlotnik ch. 34) and increasing demands, and by the overriding political conflict about territorial control and self-determination.

The above differences in use must be seen as a result of differences in hydrostrategic positions, economic strength, planning approaches, and Israel's occupation policies. Israel is an upper riparian on the Jordan River, and a lower riparian on the Yarmouk River and the Mountain Aquifer. The Zionist movement, and after 1948 the State of Israel, early on developed ambitious plans and concepts for the systematic development of the region's water resources for the newly established Jewish community. In 1964, despite substantial protests by the Arab League and after years of conflict, Israel succeeded in implementing the so-called National Water Carrier, which diverts some 400 MCM/yr of Jordan River water from Lake Tiberias to the coastal plain and the Negev Desert. Also, even before the foundation of the State of Israel, Zionist settlers started to pump groundwater, both from the Coastal Aquifer, as well as from the Mountain Aquifer, within the border of 1948/49 (Green Line). The Six-Day-War in 1967 consolidated Israel's hydro-strategic position with the annexation of the Golan Heights, and the occupation of the West Bank and the Gaza Strip. As part of its occupation policies, Israel practically froze Palestinian pumping from the Mountain Aquifer, while it drilled new wells for the growing number of Israeli settlements and continued pumping from the confined zones within the Green Line. As a consequence, Israel is using the lion's share of the Mountain Aquifer (some 490 MCM/yr). Israel maintains a modern and highly integrated water infrastructure. With a gross municipal water supply (supply into municipal distribution systems) of about 100 m³/c/yr, domestic and industrial water requirements are well secured. Over the last 50 years, Israel has witnessed a transition from an agricultural to a post-industrial society (Feitelson 2000: 356f). As a consequence, the contribution of agriculture to GDP has declined to some mere 2% in the 1990's. Still, agriculture constitutes the largest source of water usage, accounting for some 60% of the total use in 1994 (Table 42.2).

Jordan is a lower riparian both on the Yarmouk and the Jordan Rivers. It has always been in a disadvantaged position, both in terms of rainfall and hydrostrategic position. Emerging regional realities in the 1950's, in particular Jordan's absorption of Palestinian refugees and Israel's water development plans,

led to the consideration of two major water projects, a large dam on the Yarmouk River (the Al Wehda/Maqarin Dam, initially foreseen to store some 300 MCM/yr), and irrigation canals east and west to the Jordan in the Jordan Rift Valley. Jordan has only been able to implement one of these schemes, the diversion of the Yarmouk into the East Ghor/King Abdullah Canal, east of the Jordan, providing some 100-140 MCM/yr since 1961. In 1953, Jordan concluded an agreement with Syria on the construction of the Al Wehda Dam which was revised in 1987 and renewed in 1998. During the late 1970's and the 1980's, the U.S. government undertook several attempts to mediate the implementation of the project, but in the end, Congressional support for Jordan was declined due to Israel's veto (Lowi 1995: 175). In the meantime, Syria's water consumption in the upper Yarmouk has steadily increased, and while Jordan is still interested in the project, its economic viability has become questionable. After the Six-Day-War, Jordan lost control of the West Bank and in 1988, King Hussein officially disengaged with the West Bank in favour of the Palestinians (Haddadin 2000: 278). Jordan's water economy has been running a significant water deficit for years, with declining groundwater tables in the highlands, and is characterised by huge managerial challenges. During the summer, households in Amman receive water once or twice per week for 12-24 hours and unaccounted-for-water, the share of the water delivered into a distribution system which is not billed or recorded at the user, and thus physical and 'administrative' losses, is above 50% (Iskandarani 2001: 12). The water deficit is the main constraint for growth in the agricultural sector. In 1994, the average gross municipal water supply was 55 m³/c/yr, and agriculture accounted for 74% of water usage.

The Palestinians in the West Bank are in an upstream position on the Mountain Aquifer and in a downstream position on the Jordan. The aquifer underlying the Gaza Strip is mainly recharged from rainfall above the strip. In 1967, when Israel took over control of the West Bank from Jordan and the Gaza Strip from Egypt, both communities were mainly relying on springs and traditional groundwater wells. Israel's Military Orders *de facto* abolished existing Jordanian and Egyptian water law and required licences for any drilling activities. The associated procedures made any water development activities by Palestinians almost impossible (Dillman 1989; Elmusa 1997: 260ff; Rouyer 2000: 45ff). Instead, several West Bank towns and villages were connected to the Israeli water system, a move which was considered by many Palestini-

Table 42.2: Comparison of the Near East Water Economies. **Sources:** (1) WDI 1998; (2) GTZ 1998b; (3) Isaac 2002 (no year).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
	Popu- lation ¹	Popula- tion growth ¹	GNP per capita ¹	Contribu- tion of agriculture	Total water use per capita ²	Gross municipal water supply ²	Unac- counted- for-water ²	Share of agricultural water use, incl. reu- sed wastewater ²	
	1996	1980-1996	1996	1996	1994	1994	1994	1994	
	millions	%	US\$/c/yr	% of GDP	m ³ /c/yr	m ³ /c/yr	% of (6)	MCM/yr	%
Israel	6	2.4	15,870	2.4 ³ 1993)	360	100	15	1180	62
Jordan	4	4.3	1,650	5 ¹	220	55	55	670	74
West Bank & Gaza	2	4.0	1,300 ³	7 ³	110	38	41/51	150	64

ans as part of Israel's *de facto* annexation. Water from the Israeli system was supplied at full costs, which put a heavy burden on Palestinian households. While the West Bank population grew by about 84 % between 1967 and 1987, domestic water supply increased by only 20 % and water supply for agriculture and industry was frozen (Baskin 1993 quoted in Albin 2001: 154). In addition, many West Bank towns suffer from unreliable and insufficient supplies, and many villages are not connected to a water distribution system at all. In consequence, despite the seemingly favourable upstream position on the relatively abundant Mountain Aquifer, Palestinian water consumption in the West Bank is the lowest in the region, with a gross municipal supply of 30 m³/c/yr. In the Gaza Strip, municipal supply is higher (58 m³/c/yr), but water quality is far below drinking water standards. For years, the shallow aquifer underlying the strip has been over-pumped, leading to salt and seawater intrusion (see also Twite ch. 32). The water shortage constitutes a development constraint to Palestinian agriculture and the economy as a whole.

42.2.2 Dimensions of the Middle East Water Crisis and Possible Management Responses

Competition for Middle East water resources has led to an extensive debate about management options (Assaf/Al Khatib/Kally/Shuval 1993; Dombrowsky 1995; GTZ 1998a, 1998b; Allan 2001). In principle, a variety of responses exist for different dimensions of the Middle East water crisis: (1) alleviating the domestic water provision problems in Jordan and the Palestinian communities, and securing long-term domestic and industrial supplies for all inhabitants in the region; (2) responses to the crisis of the agricul-

ture and irrigation sector; and (3) preventing the further degradation of the resource base.

The most pressing need is to alleviate the domestic crisis in the Greater Amman area, the West Bank, and Gaza. All three areas face both shortage and significant management challenges. The first response has been to improve water management systems (including the reduction of distribution losses and unaccounted-for-water), and different forms of management contracts are being implemented at several locations (Schiffler 2001: 8f). While progress is slowly being made, in each case, additional supplies will be needed.

In Amman, the alternatives are, in order of costs: the reallocation of groundwater used for irrigation in the uplands, the reallocation of internationally shared water resources, the mining of the fossil Disi Aquifer in the south of the country, and seawater desalination at the Red Sea. The first option comes at high internal costs; the second at high external political costs; the third is relatively expensive (almost US\$ 1/m³; Schiffer 1997: 223) and implies mining of a non-renewable resource; and the fourth is even more expensive. In the Gaza Strip, the only alternatives are additional supplies from Israel (the reallocation of shared resources), and brackish water and seawater desalination. Clearly, the current state of the Gazan economy constrains the application of large-scale seawater desalination (the consumption of 100 m³/c/yr at a price of US\$ 1/m³ would account for approximately 10 % of a person's annual income). In the West Bank, next to the reallocation of existing uses, there is limited scope to drill wells in the Eastern Mountain Aquifer which discharges towards the Dead Sea; however, the exact safe yield is not known and large portions are brackish (Isaac 2002: 153). Given that the West Bank is entirely land-locked, additional re-

sources (such as seawater desalination) could only be mobilised with Israeli assistance.

Given rising domestic and industrial demands, the agricultural sector, historically a pillar of all three societies and a backbone of their economies, is increasingly under pressure. While economic reasoning speaks for a reallocation of low-value agricultural freshwater uses to higher value-adding uses, implementing such reallocations is difficult for all governments. It is increasingly happening in Israel which has the economic alternatives to do so. A first reallocation took place in the mid 1980's, and while agricultural water use increased during the first half of the 1990's (when Israel had to expect international bargaining over water resources), it happened again in the second half of the 1990's (Allan 2001: 248f). In Jordan, small-scale informal water markets have existed for a while (Schiffler 1997: 308). During the drought in 1999/2000, the Jordanian government for the first time paid compensation to farmers in the Jordan valley to let their fields lay fallow.³ The situation is less obvious in the Palestinian territories, where absolute consumption levels are very low to begin with.

Allan (1996, 2001, ch. 41 above) argues that since the 1970's, the silent answer to the agricultural water crisis has been the increased import of staple food from international markets. The Middle East water economies thus partly overcome the region's water gap by importing "virtual water", water embedded in food. Another option for the agricultural sector is the substitution of freshwater by treated wastewater. The use of the desalinated water is prohibitively expensive for most agricultural production.

Beyond water quantity, water quality plays an important role. The environment in the region is fragile (Twite ch. 31; Oka ch. 32) and preventing the further degradation of the resources, in particular the irreversible degradation of groundwater resources, would save significant costs for future generations.

In summary, there are two main answers to the scarcity of indigenous water resources in the region, the substitution of freshwater uses in agriculture, both by international food imports and by the reuse of treated wastewater, and the desalination of seawater.⁴ For countries with access to the sea, desalination puts an upper bound on the costs of water (Fisher

1995: 379), of about 60 US cents/m³ plus transport. This option exists for Israel, Gaza and Jordan, though not for the West Bank. While solutions to most dimensions of the water crisis thus exist, the costs for each player are co-determined by the *de facto* property rights regime. This regime by in large came about by unilateral appropriation. It has put both the Jordanians and the Palestinians into a disadvantaged position and was therefore heavily disputed. This is why both Jordanians and Palestinians, with the emerging peace talks in the beginning of the 1990's, put water negotiations on the agenda.⁵

42.3 Water Negotiations in the Middle East Peace Process

42.3.1 Negotiation Positions and Architecture of the Peace Talks

Jordan listed water for the first time at the Madrid Conference in 1991 (Haddadin 2000: 277). The main reference point for Jordan's negotiations with Israel was the so-called Johnston Plan. From 1953 to 1956,

3 Kenley Brunsdale, Middle East Water and Energy Institute, presentation at the Middle East Institute/World Bank Sixth Annual Conference, Washington DC, May 15, 2001.

4 Other options for the mobilisation of 'new and additional' water resources to the region have been discussed extensively, including the Red Sea-Dead Sea and the Med Sea-Dead Sea canals, water imports by tankers, vinyl bags or pipelines from different points of origin (for a joint Israel-Jordanian-Palestinian study see GTZ, 1998a). However, most of these options are more costly than standard seawater desalination, and those which could be cheaper (imports from Lebanon or Egypt), are politically constrained. This does not exclude some reliance on imports (see ongoing discussions between Israel and Turkey), but it is likely that the bulk of new and additional water for the region will come from regular seawater desalination.

5 North (1990: 47) explains: "The existing structure of rights (and the character of their enforcement) defines the existing wealth-maximising opportunities of the players, which can be realized by forming either economic or political exchanges. Exchange involves bargains made within existing institutions, but equally the players at time find it worthwhile to devote resources to altering the more basic structure of the polity to reassign rights." Whether or not, Jordanian and Palestinian negotiators implicitly performed cost calculations, cannot be determined at this point; they certainly questioned the legitimacy of the *de facto* water regime. Interestingly, economists emphasise that the value of the property rights in dispute is small compared to potential gains from cooperation (Fisher 1995; Becker/Zeitouni, 1998, see below).

the U.S. envoy Eric Johnston mediated the water dispute on the Jordan River, and technical experts finally agreed on water allocations for Syria, Lebanon, Israel, and Jordan (including a quota for the West Bank). While the Israeli Government agreed to this plan, the Arab League finally decided not to ratify it. The reason for Israel's consent and the rejection through the Arab League was the same: the ratification of an international agreement with Israel would have implied its political recognition (Feitelson 2000: 348). Following the Johnston mission, the U.S. government provided financial support to Israel's and Jordan's unilateral water projects conditional on their compatibility with the Johnston Plan (Elmusa 1995: 69). While Jordan had continued to adhere to the plan, Israel and Syria moved far beyond their Johnston Plan quotas in the use of the Yarmouk. Jordan claimed that Israel was pumping more than 75 MCM/yr, as supposed to 25 MCM/yr in the plan (Haddadin 2000: 279). Following Israel's recognition of the Palestinian Liberation Organisation (PLO) as direct negotiation partner, Jordan was ready to negotiate water with Israel on a bilateral basis (Haddadin 2000: 278, 286).

For the Palestinians, the primary concern and demand was a recognition of their water rights in the Mountain Aquifer and the Jordan River in accordance with the *Helsinki Rules* of international water law.⁶ They therefore demanded an equitable share in the access to the groundwater resources which are recharged in the West Bank. As a co-riparian to the Jordan River, they also demanded their share in the Jordan with reference to the West Bank allocation in the Jordanian quota in the Johnston negotiations, plus an additional allocation to equalise their per capita water consumption (Albin 1999: 341). In addition, they argued that Israel's occupation practices with regard

to water contradicted the international law of belligerent occupation, such as the Hague Regulations IV of 1907 and the Fourth Geneva Convention of 1949 (Dillman 1989: 14f; Rouyer 2000: 178ff; Edig 2001, 266ff). However, according to Albin (1999: 334), the 1993 Oslo Declaration of Principles recognised the status quo as a starting point for the negotiations, and thus excluded claims for compensation. The Palestinians furthermore argued that water rights must be recognised before they could talk about better management of water resources. They also demanded access to basic hydrological data in the West Bank, withheld by Israel. The fact that they lacked fundamental data on the water situation in the West Bank, made it more difficult to build up a sound negotiation position.

Israel first rejected to talk about water rights (Albin 1999; Rouyer 2000). It claimed that it had a right to the waters it had developed and that these waters were of existential importance for the survival of the State of Israel. It argued that the waters of the Western and North-eastern Mountain Aquifer had already been used from within the Green Line before 1967. This notwithstanding, Israel was not uninterested in talks about water. Its concern was that its Arab neighbours did not use the water efficiently enough. It was also afraid that the Mountain Aquifer could become polluted. The water problem was declared a management problem which required continued Israeli control over the water resources. The main solution to the water shortage in the Arab communities was seen in the mobilisation of new and additional water resources. Israel emphasised that agreements must bring gains to both sides (Albin 1999: 344). It declined to use the Johnston Plan as a reference, referring to the non-ratification through the Arab League and Syria's violation of its provisions. At a more general level, according to Albin (1999: 335), Israeli lawyers maintained that the Israeli-Palestinian negotiations were unique and that there were no clear international legal norms by which they could be judged, and that interpretations of international law were politically biased. While Israel rejected Palestinian legal claims, there was some recognition of Palestinian humanitarian rights to water (Albin 1999: 346).

Israel ended up having the greatest influence on shaping the negotiations over water. It insisted that water rights, if at all, should solely be negotiated in bilateral talks. The multilateral talks, which had been set up for five topics of regional significance, including water (see Oka ch. 33), however, remained restricted to technical aspects of water management. Syria

6 International water law has been late to be codified. In 1966, the International Law Association, a non-governmental professional association, adopted the *Helsinki Rules*. In May 1997, after more than 20 years of negotiations, the UN General Assembly adopted the 'UN Convention on the Law of the Non-navigational Uses of International Water Courses'. The Convention focuses on four principles, the principle of equitable and reasonable utilisation and participation, the obligation not to cause significant harm, the general obligation to cooperate, and the obligation of prior notification. Until June 2000, the Convention had only been ratified by seven countries world-wide, including Jordan, Syria, and Lebanon. Israel abstained during the vote (Allan 2001: 302f).

and Lebanon boycotted the multilateral talks from the beginning. In the end, water agreements were stricken as part of the Israeli-Jordanian peace treaty, as well as the early interim agreements between Israelis and Palestinians. In addition, Israel, Jordan, and the Palestinian Authority signed a trilateral Declaration of Principles for cooperation on water-related matters.

42.3.2 The Israeli-Jordanian Water Agreement

Article 6 of the Peace Treaty between Israel and Jordan signed on October 26, 1994, aims at a “comprehensive and lasting settlement of all the water problems” between the two countries through mutual recognition of their “rightful allocations” in the Jordan River, the Yarmouk River and groundwater in Wadi Araba/Arava, and cooperation in the development of existing and additional water resources.⁷ Details are stipulated in Annex II. In principle, the agreement maintains existing uses, with some qualifications with regard to Israel’s extractions from the Yarmouk River.⁸ In addition, the annex outlines a number of joint projects for the mobilisation of additional waters for which Jordan shall be the main beneficiary. This includes the storage of 20 MCM/yr of Yarmouk water in Lake Tiberias in the winter for Jordanian use in the summer; the transfer of 10 MCM/yr of desalinated water from Israel to Jordan; the extension of the diversion from the Yarmouk to the King Abdullah Canal; additional dams on the lower Jordan and other agreed locations; as well as Israel’s provision of 50 MCM/yr of water of drinking water quality from yet to be identified sources. In addition, the agreement allows for additional Israeli pumping of up to 10 MCM/yr of groundwater in Wadi Araba/Arava, subject to respective studies (Table 42.3). The details of the implementation are to be determined by a Joint Water Committee (JWC).

The agreement does not specify the exact amounts of water that shall be supplied to Jordan.

Jordanian government officials have argued that a total of 215 MCM/yr could be provided in the context of the treaty (GTZ 1997: 2-8). The agreement also remains incomplete with regard to the technical and financial details of the various projects, such as location, implementation schedules, and funding modalities (Edig 2001: 143). It also lacks provisions on drought management, so important in this region, as well as for conflict resolution (Allan 2001: 219). At a more fundamental level, it does not contain provisions for the inclusion of other co-riparians⁹, and as Edig (2001: 146ff) argues, given that virtually every drop of water is being allocated, it makes peace at the cost of the environment.

Implementation proved to be slow and difficult. Still, over time, a number of the provisions of the agreement were implemented. The Joint Water Committee was set up in 1994 and started to meet regularly. In July 1995, Jordan started to store winter flows in Lake Tiberias (20 MCM/yr). In May 1997, Israel agreed to provide an additional 25-30 MCM/yr, apparently as part of the 50 MCM/yr to be identified water (Haddadin 2000: 287). In December 1999, the new diversion dam at Adassiya became operational (Haddadin 2000: 282). Five years after signing of the treaty, Jordan received an estimated additional 50-80 MCM/yr of water, less than 10% of its total water consumption, and not more than a third of the water it had originally hoped for, but something. Serious controversies surrounded financial issues, such as the O&M costs for the water transfer from Lake Tiberias or the financing of the desalination plants from which Jordan was to receive 10 MCM/yr (Kliot/Shmueli 1998: 221). The most serious test of the agreement to date occurred during the extremely dry winter of 1998/1999, when Israel announced that it would stop its transfer from Lake Tiberias to Jordan (Allan 2001: 220f). Jordan apparently threatened with a stop of official relations, and Israel finally turned in (Edig 2001: 143).

7 *Treaty of Peace Between The State of Israel and The Hashemite Kingdom of Jordan*, 26 October 1994.

8 Article I.1 a. & b. of Annex II limit Israel's extractions from the Yarmouk to 25 MCM/yr. This implies a reduction from an estimated extraction of c. 75 MCM/yr. Article I.1.c. however allows for the use of additional excess water downstream of point 121/Adassiya through both parties. According to Edig, Israel was able to catch such unused flows in the order of 45 MCM/yr, as long as the new diversion dam at Adassiya was not completed (Edig 2001: 145).

9 Haddadin (2000: 279) maintains that the Jordanians stressed during the negotiations “and the Israelis recognized that the outcome of their negotiations would not prejudice the rights of the other parties, especially the Palestinians”. This understanding, however, is not reflected in the treaty.

Table 42.3: Agreed Projects and Implementation of the Israeli-Jordanian Peace Treaty Annex II

Para-graph	Agreed Project	Costs	Quantity to Jordan MCM/yr	Implementation until April 2000
I.1	Water from the Yarmouk River a. Summer period. Israel pumps (12) MCM b. Winter period. Israel pumps (13) MCM + additional (20) MCM to be returned in summer according to paragraph 2.a. c. Israel and Jordan may use, downstream of point 121/Adassiya diversion, excess flood water.		?	'Israel's pumping of water from Jordan's winter share in the Yarmouk started in December [1994].'
I.2	Water from the Jordan River a. Summer period. Israel transfers to Jordan (20) MCM in accordance with 1.b. b. Winter period. Jordan to store a minimum average of (20) MCM of the flood in the Jordan R. south of its confluence with the Yarmouk. Excess floods can be used for the benefit of the two parties. c. Israel to maintain its current uses between Yarmouk and Tirat Ziv/Waid Yabis. Jordan entitled to an equivalent annual quantity provided to not harm to Israeli uses. d. Jordan entitled to (10) MCM of desalinated water from desalination of about (20) MCM of saline springs now diverted to the Jordan R. Until facilities are operational, Israel will supply from same location as in 2.a subject to transmission capacity.	Jordan: O&M costs through existing system & capital costs for any new transmission Israel to explore O&M costs of supply to Jordan	20 20 [30-40] ? 10	'...water started to flow from the lake in July of 1995' 'Studies to determine the feasibility of building dams on the Jordan River were not completed because of lack of cooperation.' 'Israel's commitment to set up treatment plants to protect the Jordan river from the disposal of raw wastewater and salty spring water have not yet materialized.'
I.1.3	Additional Water Shall cooperate in finding sources for the supply to Jordan of (50) MCM of water of drinkable standards. JWC will develop a plan within one year.		50	'The pipeline was ready to transfer the additional water that on May 7, 1997 was agreed to be released from Lake Tiberias on account of the additional 50 MCM stipulated in the Annex. The total Jordan receives from the Lake amounts to 55 MCM...'
II.	Storage 1. Shall cooperate to build a diversion/storage dam on the Yarmouk River directly downstream of the point 121/ Adassiya Diversion to improve diversion efficiency into King Abdullah Canal, and possibly for diversion of Israel's allocation of the river water. 2. Shall cooperate to build a system of water storage on the Jordan River according to 1.2.b; Israel may use up to (3) MCM/year. 3. Other storage reservoirs can be discussed and agreed upon mutually.		? [20-25] ?	'...the diversion dam at Adassiya...was completed in December 1999'.
IV.	Groundwater in Emek Ha'Arava/Wadi Araba 4. Israel may increase the abstraction rate from wells and systems in Jordan by up to (10) MCM/year subject to no harm.			'Studies to determine ...increase in pumping for Israel in Wadi Araba were not initiated for lack of will and finance. As an interim measure, Jordan allowed an increase of pumping of about 5 MCM per year...'

Sources: Peace Treaty; Implementation: quotes from Haddadin (2000: 282; 287); figures in brackets indicate Jordanian estimated volumes (GTZ 1997: 2-8); in addition, Jordan hopes to develop 75-85 MCM/yr through the Al Wehda dam on the Yarmouk River (ibd.).

42.3.3 The Israeli-Palestinian Interim Water Agreement

The most important water-related agreement between Israel and the PLO is Article 40 of the Taba (Oslo B) Interim Agreement of 28 September 1995.¹⁰ The Declaration of Principles of 23 September 1993 and the Cairo (Gaza-Jericho) Agreement of 4 May 1994 had prepared the ground by formally establishing the Palestinian Water Authority (PWA) which was set up in April 1995. The Oslo B Agreement was supposed to determine the tasks of PWA. Given the Israeli negotiation position, the most remarkable aspect of the agreement is that Israel formally recognised Palestinian water rights in the West Bank. These, however, “will be negotiated in the permanent status negotiations and settled in the Permanent Status Agreement in relation to the various water resources”. The agreement furthermore confirms Israel’s current uses and foresees the provision of additional water resources for the Palestinians during the interim period from the Eastern Mountain Aquifer and other agreed resources. The future water needs of the Palestinians are estimated at 70-80 MCM/yr. During the interim period, in order to meet the “immediate needs” of the Palestinians a total of 28.6 MCM/yr shall be made available out of which 9.5 MCM/yr shall be supplied through the Israeli distribution system (including 5 MCM/yr for the Gaza Strip and a new well in the Jenin area) (Table 42.4). A Joint Water Committee (JWC) (with various sub-committees) is responsible for the implementation of the agreement in the interim period, operating on the basis of consensus. Other aspects concern the proper treatment of sewerage and resource protection.

The agreement has been harshly criticised by both sides, but particularly by Palestinian water specialists. While the agreement gives PWA the control over existing uses, Israel *de facto* maintains veto-power for any water development activities by PWA. The water supplied from Israel comes at the full costs and furthers Palestinian dependence on Israeli supplies. The costs for the drilling of new wells for the Palestinians in the Eastern Aquifer are to be born by the Palestinian Authority. While Israel is able to continue pumping from the Western Aquifer in the confined zone

inside the Green Line at low costs, the Eastern Aquifer is much less well understood, access is much more expensive, and the risks of pumping brackish water are higher. Furthermore, while the Palestinians still have very limited control over the freshwater resources, they bear the main responsibility for their protection from pollution (Dombrowsky 1998: 100).

These difficulties became apparent in the implementation process. While the institutions have been set up and the members of JWC are interacting on a regular basis, Palestinians so far see little change on the ground (Rouyer 1999: 125ff; Isaac 2002: 160). The Palestinian Water Authority has assumed its tasks, including water monitoring, planning, regulation, development and donor co-ordination. According to Rouyer (1999: 117), it works reasonably well and is further along in its bureaucratic specification than other PA agencies. Its main activity so far has been the implementation of the Interim Agreement, i.e. submitting proposals to the JWC, getting approval, and seeking donor support for implementation. The approval process has proved extremely cumbersome, and according to some observers, is even more complicated than during Israeli occupation. For areas controlled by the Palestinian Authority (A areas) and for those under joint Israeli-Palestinian control (B areas), PWA submits project proposals. JWC transfers the request to the Israeli Hydrological Service and issues a permit upon their approval. For areas under Israeli control (C areas), projects require the additional approval of all 14 departments of the Israeli Civil Administration (military administration in the West Bank). This process may take several months for one permit. Separate permits are required for different parts of a project, such as drilling, pumping, distributions systems, or construction roads and buildings. According to Isaac (2002: 160), by mid-2001, a fourth of all requests had been approved. The agreement also foresaw the set-up of Joint Supervision and Enforcement Teams (JSETs). While they have been working reasonably well after some initial difficulties, they have stopped operating since the outbreak of the Al-Aqsa Intifada in September 2000.¹¹

By the end of 1998, no Palestinian well had yet been drilled, and Israel was delivering 3.4 MCM/yr out of the 4.5 MCM/yr it was supposed to supply to the West Bank. According to Isaac (2002: 160), by

10 *Interim Agreement Between the State of Israel and the Palestinian Authority on the West Bank and the Gaza Strip*, Article 40, Water and Sewage, Washington DC, 28 September 1995.

11 Zafir Rinat: “The wells are running dry in West Bank villages”, in: Ha'aretz, 23 May 2001, also at: <<http://www2.haaretz.co.il/special/water-e/d/365019.asp>>, 23 January 2002.

Table 42.4: Agreed Projects and Implementation of the Israeli-Palestinian Oslo B Agreement Article 40. **Sources:** Interim Agreement; implementation: Edig (2001: 306), based on Interview Jan. 15, 1999.

Para-graph	Agreed Project	Capital costs	Quantity (MCM/yr)	Implementation until end 1998
7.a (1)	Additional supply to Hebron and the Bethlehem area, including the construction of the required pipeline	Israel	1	yes
7.a (2)	Additional supply to Ramallah area	Israel	0.5	no
7.a (3)	Additional supply to an agreed take-off point in the Salfit area	Israel	0.6	under construction
7.b (4)	The connecting pipeline from the Salfit take-off point to Salfit	Palestine		
7.a (4)	Additional supply to the Nablus area	Israel	1	yes
7.a (5)	The drilling of an additional well in the Jenin area	Israel	1.4	yes (Jenin 2)
7.b (4)	The connection of the additional well in the Jenin area to the consumers	Palestine		
7.a (6)	Additional supply to the Gaza Strip	Israel	5	under discussion
7.b (3)	A new pipeline to convey the 5 mcm/year from the existing Israeli water system to the Gaza Strip	Palestine		
7.b (1)	An additional well in the Nablus area	Palestine	2.1	permit issued
7.b (2)	Additional supply to the Hebron, Bethlehem and Ramallah areas from the Eastern Aquifer or other agreed sources in the West Bank	Palestine	17	through drilling of four wells
7.b (6)	The remainder of the estimated quantity of the Palestinian needs (...) shall be developed from the Eastern Aquifer and other agreed in sources in the West Bank	Palestine	41.4-51.4	no

2001, supply had been augmented to 12 MCM/yr. Still, given growing population figures and the drought conditions in 1999-2001, the supply situation has worsened in Palestinian towns and villages.¹² The general climate between Israelis and Palestinians has steadily deteriorated since early 1996. As a reaction to Palestinian suicidal terror attacks, Israeli withdrawal from the West Bank slowed down and eventually came to a halt, and the parties were not able to conclude the final status negotiations due by September 2000. Discussions on the final status of water issues were virtually non-existent in the interim (Isaac 2002: 160). Since September 2000, with the outbreak of the Al-Aqsa Intifada, relations have further dramatically deteriorated. Since the end of 2001, the Palestinian Authority itself has increasingly been a target of Israeli attacks.¹³ Apparently, given the interdependence of Israeli and Palestinian water infrastructure, water has been the main field where some form of collaboration continued despite increased violence, at least during 2001, although claims are contradictory (see also Twite ch. 32).¹⁴

12 Ibid.

13 E.g. "Building a Palestinian state, in reverse", in: *The Economist*, 19 January 2002: 37.

42.3.4 The Trilateral Declaration of Principles

The Multilateral Working Group on Water Resources had been established as a forum to foster regional cooperation on technical issues like data and the mobilisation of new and additional water resources. The forum met until 1997, but a number of projects continue to be carried out.¹⁵ In the context of the Working Group, Israel, Jordan, and the Palestinian Authority, on 12 June 1996, signed the "Declaration of Principles for Cooperation on Water Related Matters and New and Additional Water Resources."¹⁶ The document seeks to foster trilateral cooperation in the mobilisation of new and additional water. It does so by differentiating "existing water resources," "additional water resources developed pursuant to bilateral agreements" and "new and additional water resources."

14 Ze'ev Schiff: "Israel-PA Cooperation in Water - the One Exception", in: *Ha'aretz*, 13 February 2001, at: <<http://www.cdn-friends-icej.ca/isreport/janfeb01/water.html>>, 23 January 2002; Israeli-Palestinian Joint Water Committee: "Joint Declaration for Keeping the Water Infrastructure out of the Cycle of Violence", done at Erez Crossing, 31 January 2001, at: <<http://www.mfa.gov.il/mfa/go.asp?MFAH0jcs0>>, 23 January 2002.

15 Chuck Lawson, US State Department, in a conversation on May 15, 2001.

The document stresses that the “development of New and Additional Water Resources will not adversely affect the development or utilisation of Existing Water Resources.” As such, it maintains an artificial separation of waters, and excludes the search for cooperative solutions based on the integrated management of all water resources (Dombrowsky 1998: 102). At this point, it is unclear whether the declaration has gained any practical relevance. Rouyer (2000: 240) reports that the chief Palestinian representative to the water working group, Riyad el-Khoudary, “referred to the declaration as a ‘piece of paper’ from which nothing has come. In his view, the declaration sounds nice but had not brought the Palestinians water rights or additional water.” Whatever role the declaration will eventually play, its conceptual thinking reflects the “sanctioned water discourse” (Allan ch. 41) in the Middle East.

In summary, the Middle East Peace Process brought about a number of water-related agreements which have partly been implemented so far. In the case of Jordan, Israel has made some concessions (a) enabling Jordan to improve its use from the Yarmouk River, and (b) eventually initiating some limited water transfers. While this transfer is not insignificant, it is much less than Jordan had initially hoped for in accordance with the agreement. The projects aimed at the joint mobilisation of additional resources have not yet materialised. In the case of the Palestinians, no final agreement on the property rights regime has been reached yet. In the meantime, Palestinian water management is based on the 1995 Interim Agreement which foresaw some additional imports from Israel (going along with increased interdependency), and allowed for the development of the Eastern Aquifer and other agreed sources upon Israeli consent. This process has proved to be extremely cumbersome, and overall, the water supply situation for Palestinians in the West Bank has rather deteriorated than improved. The Trilateral Declaration has furthered a fragmented management approach.

42.4 Interpreting the Middle East Water Accords

42.4.1 General Observations

There are similarities as well as considerable differences between the Israeli-Jordanian and the Israeli-Palestinian water agreements. While both Jordanians and Palestinians negotiated for a higher share in the region’s water resources, both agreements seek to avoid the reallocation of property rights in water (with some exceptions in the Israeli-Jordanian agreement), but aim at developing additional resources for the Palestinians and Jordan respectively. One consequence is that the poorer countries remain technologically and organisationally more challenged, and have to pay a higher price for water.

Both agreements were struck at the end of more comprehensive negotiations. Allan (2001: 219ff) argues that this demonstrates that water was clearly sub-ordinate to issues of borders, military security in the case of Jordan, and to questions of control of land, refugees, Jerusalem, and the permanent status of the Palestinian entity in the case of the Palestinians. This means that these agreements are pragmatic. They are not designed to solve the water crisis and overcome conflict on water resources for once and ever (although the Jordanian agreement claims to do so). Their purpose was to allow movement forward on other issues. While they partly refer to principles reminiscent of international water law, they are not led by these principles, nor are they necessarily inspired by a longer-term vision of cooperation in a situation of mutual dependency. Rather, the agreements reflect the prevailing differences in power. Still, in both cases, Israel had to make some concessions vis-à-vis its negotiation positions, otherwise its negotiation partners could have walked away from the negotiation table. The question is whether these concessions were large enough to allow for ‘stable’ outcomes, however defined.

Another consequence of the bargaining process is that these agreements remain incomplete. While this is no uncommon phenomena in international politics and there might be good reasons not to seek to anticipate all outcomes in advance and to leave room for flexibility, it seems that trust and mutuality are important for the functioning of incomplete contracts. The incompleteness implied that there would be considerable need for further bargaining in the implementation of the agreements. In that respect, the question is whether both, Palestinians and Jordanians, could

16 *Declaration of Principles For Cooperation on Water-related Matters and New and Additional Water Resources*. Joint Statement by the State of Israel, the Palestinian Authority, and the Hashemite Kingdom of Jordan. Oslo, 12 June 1996 (production: CESAR, Oslo, Norway).

not have tried to sell more 'water-proof' agreements to Israel. While the agreements are incomplete, they do not allow for much flexibility. For instance, there are no provisions for the use of economic instruments.

Despite these similarities, there are several differences. The Jordanian-Israeli water agreement is part of a fully-fledged peace agreement between two sovereign states, mainly dealing with surface water resources. The agreement between Israel and the Palestinians is an interim agreement between a state and a community with ambiguous status. It deals with the management of shared groundwater resources which is recognised to be more complex than the management of surface water resources, and for which international law is even in a more embryonic stage (McCaffrey 1999).

42.4.2 The Negotiations between Israel and Jordan

In the case of Israel and Jordan, despite the distributional conflict on water, Israel and Jordan did have mutual interests, albeit at different levels: while the downstream country Jordan demanded a larger share of water, Israel, given its isolated position in the region, was interested in a 'warm' peace with Jordan (Elmusa 1995: 64f; Edig 2001: 145). Jordan could threaten to walk away from the peace deal, if Israel did not cooperate on water. The solution to the water conflict between Israel and Jordan thus corresponds to a *linkage strategy*: additional water for Jordan in exchange for a peace deal in which Israel was particularly interested.¹⁷ While Jordan has so far been able to implement some of the projects, and has received some of the water transfers, Israel, as upper riparian maintains the larger leveraging power in the long run. Israel will cooperate as long as it perceives peace with Jordan as important. It is in this sense that the agreement, while referring to principles in rhetoric, must be understood as unprincipled. The agreement does not provide an attempt to solve joint water problems in a situation of mutual dependency, therefore its incompleteness and 'missing' provisions. It represented the minimum concession for which Israel could buy the Peace Treaty with Jordan.

Given the ambiguity and incompleteness of the agreement, implementing the agreement was and is

bound to give rise to considerable tensions, and to go along with substantial transaction costs. In view of these transaction costs, there were and are trade-offs for Jordan between bargaining a comparatively inexpensive solution with Israel, compared to implementing the next best internal water supply strategy (e.g., pumping groundwater from the fossil Disi aquifer in the south of the country to Amman). The question is whether the two parties have missed an opportunity. Could the agreement have been structured in a way that is self-enforcing, i.e. in the self-interest of both parties to implement (Barrett 2000)? Haddadin (2000: 287) hints at the problem of enforcement when he argues that the agreement partly provides insufficient inherent incentives for Israel to implement it: "Israel is not too much in favor of storage on the Jordan itself as Jordan is the beneficiary from such storage, and Israel benefits very little."¹⁸ Maybe Jordan would have been better off if the two parties had shared the benefits from new projects equally. This raises fundamental questions about the design and fairness of such water sharing agreements.

42.4.3 Negotiations between Israel and the Palestinian Authority

The water and sewerage part of the Oslo B accords laid the basis for a first 'chunk' of Palestinian sovereignty over water resources by the newly established Palestinian Water Authority (PWA). While PWA assumed responsibility for the management of the desperate water crisis in the Gaza Strip - a situation from which Israel without doubt withdrew happily, in the West Bank, sovereignty was only granted over the very insufficient existing uses, while water development activities, such as the drilling of new wells and the construction of related water distribution systems require approval by the Joint Water Committee. Given the asymmetry of existing uses and the high degree of resource utilisation, the implication of the modus operandi of the JWC is that Palestinian water development activities *de facto* remain under Israeli control. The fact that this comes in the disguise of 'co-operation' and 'joint management' within the Joint Water Committee has led to quite some confusion in the literature.¹⁹

17 According to Zürn (1991: 213), linkage strategies are the classical solution to a Rambo game situation with asymmetric power and reversed interests.

18 This interpretation differs from Libiszweski's (1995: 76) that: "the zero-sum game in sharing water was complemented by cooperative win-win strategies, making a compromise easier".

The agreement is understandable from Israel's point of view. Israel did not want to forego its existing levels of use, but wanted it secured. In reverse, it granted the Palestinians the right to develop unused resources, under the condition that they would not harm Israel in any way. This has left very little leeway for the Palestinians.²⁰ Based on international relations theory, Albin (1999: 358) has argued very strongly that "Israel could not be expected to introduce or accept claims to justice which would leave the country worse off than when the talks first started". While this might be true under different circumstances, the question is whether it holds fully true in the given case, ethically, legally and pragmatically (Dombrowsky/Gottschalk/Mazouz 1996). The ethical and legal argument refers to Palestinian claims for compensation under the Hague Resolution and the Geneva Convention. Edig (2001: 266-298) argues rather convincingly that the Palestinian claim could at least partially hold. From a pragmatic point of view, the question is whether the arrangements are able to prepare sufficient ground for the long-term co-existence of the two peoples. According to a joint Israeli-Palestinian research team, the implementation process has rather undermined than bolstered Palestinian confidence in the process (Feitelson/Haddad 1998: 234f, 2001).

What are the alternatives? Since the mid 1990's, Feitelson and Haddad and their associates have discussed possible structures for the joint management of shared groundwater resources. They came up with an incremental, task-oriented approach which would allow for flexibility and confidence to be built over time. Based on the experiences with the existing

mechanisms, they stress that the first steps in setting up a management structure are crucial, and emphasise the following issues: early confidence building; monitoring and information management not to be an end in itself; agreement on the principles of allocation; the set up of a conflict resolution mechanism; and agreement on funding mechanisms and the role of third parties. They also hint at de-central solutions, such as the arrangements on wastewater treatment and reuse between the city of Tulkarem in the West Bank and the Emek Hefer Regional Council in Israel (Feitelson/Haddad 1998: 235). Their critique certainly supports the hypothesis that design does play a role. While the concept of joint management of shared aquifers is very appealing (e.g., Dellapenna 1995; Kliot 2000), one has to consider how power asymmetries and property rights come into play. The question is whether the Palestinians do not need to achieve greater 'water sovereignty' as a precondition for 'joint management'.²¹ One infrastructure measure mentioned in this context is a West Bank water conveyer.

Overall, the water agreements concluded remain captives of the politics in the region. On the one hand, they remain ambiguous and are not 'complete' enough in order to provide the required security that their provisions will be implemented, on the other, they lack instruments which would allow for flexible responses and movement towards a more rational management approach. They have laid the ground for a fragmented approach towards the management of the region's shared water resources. While most parties will have had 'good' reasons for the approach selected, and a truly regional approach might have been unrealistic at present given political issues beyond water, the fragmented management approach does have implications, particularly for Jordan and the Palestinians. Jordan, interested in building a major dam on the Yarmouk, is stuck between two different deals, one with Israel and one with Syria—although at this point the main impediment appears to be declining flows due to increasing Syrian uses (as sanctioned by the 1987 agreement). The Palestinians still hope for a share in the Jordan River, an endeavour which has also been frustrated by the Israeli-Jor-

19 A number of observers have been quite optimistic, e.g. Wolf (2000: 112) writes: "Before and during each set of concluded negotiations, both popular and academic commentary has appeared arguing that territory is critical for hydrostrategy, yet the actual solutions in each case have focused on creative joint management of the resource, rather than insistence on sovereignty. ... This has been true of agreements completed as of this writing ... where arrangements were made for joint management, in lieu of sovereignty." Kliot (2000: 211) argues that in contrast to the Israeli-Jordanian treaty, the Israeli-Palestinian agreement is not only a water 'allocation' agreement, but may even 'qualify' as a 'joint management' agreement.

20 One may ask why the Palestinians agreed to the terms of the agreement. According to Rouyer (2000: 244), the Deputy Chairman of PWA, Fadil Qawash, stated in an interview that the PA "only signed the water accords of the Oslo II agreements because they needed water immediately not in five or ten years".

21 In the case of the Indus River, the conflict was settled by choosing the economically sub-optimal strategy of 'nationalisation', rather than 'internationalisation', by granting Indian control over the eastern tributaries, and Pakistani control over the western (Bernauer 1997: 166). It is granted that this is more easily done with surface than with groundwater resources.

danian water agreement. The Declaration of Principles, by separating the analysis of existing uses from the creation of new and additional water, precludes the search for gains through an optimised management of all regional water resources.

42.5 Visions and Prospects of Cooperation

Visions of cooperation have strongly been influenced by the concept of integrated river basin management which has been promoted by economists, lawyers and environmentalists alike. The core idea is to optimise uses at the level of the hydrological unit and to share efficiency gains. The advanced version foresees the establishment of a system of tradable water permits. The more pragmatic approach focuses on the gains from cooperation in the development and management of mutually beneficial infrastructure.²²

In the framework of the Middle East Water Project, American scholars and scientists in the region are developing an economic optimisation model which can be used both for project evaluation, as well as for managing a system of tradable permits in water (Fisher 1995). Other models have been developed by Becker/Zeitouni (1998). Both claim that the gains from trade are large relative to the value of water property rights in dispute. According to Fisher (1995: 379), the water in dispute is not worth more than US\$ 110 million per year (1990 figures), and US\$ 500 million per year in 2020. According to Becker and Zeitouni (1998: 240f), the loss to Israeli farmers associated with the transfer of property rights in water from the Mountain Aquifer to the Palestinians is approximately US\$ 60 million per year; the combined net gains from water trade are estimated at around US\$ 230 million per year.

The idea of the advanced vision is to upgrade and fully integrate the region's water infrastructure, including conveyance facilities, wastewater collection, treatment and reuse schemes, and the scheduling and operation of desalination plants, and to run the system in a rational manner on the basis of economic principles (shadow prices). Allan (2001: 157), who has

made an attempt to explain the collective psychological barriers in the region against treating water as an economic good, has warned that the economic optimisation model only works for societies which can afford an integrated and functioning piped delivery system.²³ Other open questions relate to possible institutional and organisational arrangements. Obviously, the further clarification of property rights is politically important, as acknowledged by the project, although conceptually not necessary.²⁴ But organisational questions persist as well. Is the idea that the system would be run by a central management authority which develops and operates the models as well as infrastructure, collects fees, decides on infrastructure measures? Or would each government run their own (copy of the) model and try to negotiate solutions with each other?

With respect to gains from joint projects, initial lessons have emerged. One positive example includes the winter storage of Yarmouk water in Lake Tiberias and release to Jordan in the summer (a possible concession by Israel), or the de-central wastewater treatment and reuse project between Tulkarem and the Emek Hefer Regional Council. Despite potential donor support, no agreement could so far be reached on the financing of the desalination plant mentioned in the Israeli-Jordanian peace treaty. In the West Bank, PWA refuses to cooperate in the construction of joint wastewater treatment plants with Jewish settlements, as this would imply their recognition (Rouyer 1999: 130). In the short-run, Palestinian water imports from Israel to the West Bank and the Gaza Strip remain ambiguous because of the outstanding final status negotiations. There might be scope for additional wastewater projects between PWA and Israel within the Green Line. The scope for cooperation will be greater once seawater desalination becomes involved, but according to Fisher (1995: 387), for normal years desalination would not be needed before 2020 if other reasonable recycling and conveyance facilities are put in place. Overall, the benefits from joint projects alone seem to be less obvious, as they disregard the demand side.

22 This distinction reflects two different normative regulative ideas in environmental policy: the idea of 'optimal environmental protection', anchored in neo-classic economic theory, and the idea of 'the realisation of societal gains from co-operation', based on game theory, constitutional economics and new institutional economics (Suchanek 2001).

23 The model, however, allows for the incorporation of subsidies for agriculture.

24 Trade could be carried out on the basis of the current property regime, with the respective distributive repercussions (Coase 1960). To facilitate implementation, there has been talk of an escrow fund to deal with the 'water in dispute', and to use the fund for infrastructure development. Still, this requires giving up of sovereignty over 'water in dispute'.

In summary, economic analysis indicates that unmet gains from cooperation exist. Capturing these gains remains demanding, technologically and organisationally. Both the current rules of the international water regime, and hesitance by national governments to base their water management policies on economic principles, have so far not been conducive towards movement to a rational water management approach.

42.6 Conclusions

In the first half of the 1990's, the Middle East saw the establishment of transboundary water management mechanisms, and for the first time, Israelis and Jordanians and Israelis and Palestinians are officially collaborating in the management of the region's shared water resources. While bureaucrats on all sides put significant efforts into this collaboration, the rules under which this occurs are rather restrictive. In essence, the agreements have largely endorsed the previous *de facto* water regime, and remain captives of the overriding politics in the region. This mainly affects Palestinians and to some extent the Jordanians whose water resources situation remains particularly precarious and for whom the costs of water management continue to be comparatively high. Still, Israelis and Jordanians have largely accommodated themselves in terms of water, although not at full Jordanian satisfaction and with some uncertainty with regard to the permanency of future supplies. In the case of

Palestinians and Israelis, a final water agreement is still outstanding. In the meantime, the interim agreement furthers an approach of maximised Israeli control and increasing interdependence of the Israeli and Palestinian water systems. It goes along with high transaction costs and puts the Palestinians largely at Israeli good will, a situation which is likely to be perpetuated in the absence of a final status agreement.

While the agreements have certainly de-emphasised the water resources conflict, collaboration remains politically contentious. Under the current terms, it is unlikely (although not impossible) that the parties will feel confident to move towards a more rational water management approach which would allow to capture the gains from cooperation. An Israeli-Palestinian final status agreement on water could provide the opportunity for enhanced confidence building measures and consideration of flexible water management instruments, thus allowing for the exploitation of the gains from cooperation and providing a solid basis for long-term co-existence. Bringing this about, would basically require a conceptual shift in the thinking about the mutual relations. Peace treaties between Syria and Israel, and Lebanon and Israel, and their inclusion in a joint management scheme of all co-riparians, could provide additional gains. While a rational management approach is likely to bring benefits for all, and therefore provides an important vision, further conceptual work is needed on its implementation.