
The Water Conflicts in the Middle East from a Palestinian Perspective

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INTRODUCTION

Throughout the Middle East, the natural facts of water supply and the socio-political facts of water control, consumption and demand interplay to form a complex hydro-political web. The allocation of the region's three major river basins - the Nile, the Euphrates-Tigris and the Jordan - are nascent sources of tension, and potential sources of conflict. Turkish relations with both Iraq and Syria are strained over Turkey's South East Anatolia Project. Egypt is concerned about the water developmental activities of the upstream users of the Nile. Of all the Middle East's river basins, however, it is the Jordan River that hosts the most fraught and inflammable dispute.

After more than four years of meetings and negotiations since the initiation of the Middle East peace process in Madrid, the gap in the positions among regional parties is still as wide as ever. The region's hydrologists and politicians are still talking at different wavelengths. While Israel and Jordan signed a piece treaty that included an agreement on water allocation, Jordan has, thus far, not received 50 mcm of water that Israel has conceded to Jordan. The water issue was a "hot" issue in the Israeli Palestinian negotiations and will be equally "hot" on the Israeli-Syrian negotiations, whenever they resume. In the coming few pages, I shall muddle in the waters of the Middle East, frequently drawing from my previous work, to focus on the Israeli

Palestinian dimension since hydrologically, as well as politically, the Palestinian-Israeli conflict lies at the heart of the wider Arab-Israeli conflict. It is recognized that water is a particularly critical, as well as an emotional point of dispute for both Israelis and Palestinians, but there is no alternative to an honest and forthright discussion of the water issues to expose the current unsustainable reality. Finding a common understanding of water issues in the Middle East would go far to enhance the possibilities of achieving stability in the region. It is only then that the Israelis and their neighbours can negotiate long term regional arrangements. Before then, agreements concluded under duress cannot be expected to last.

THE HYDRO-GEOLOGICAL SETTING

Topographically, Israel and Palestine (defined here as the West Bank, including East Jerusalem, and the Gaza strip) are characterized by three zones: (1) a coastal plain which rises up to 200 m above sea level, and stretches from northwest of Israel to Gaza; (2) a limestone mountain ridge, reaching elevations of up to 1000 m, most of which lies within the West Bank; and (3) the Jordan Rift Valley, located on the eastern rim of Israel and the West Bank, which drops to almost 400 m below sea level. Palestine and Israel have Mediterranean climates, which are characterized by dry summers and cool wet winters. On average, 70% of total annual rainfall falls in December, January and February, of which 75% of rainfall is immediately lost through evaporation (Isaac & Selby, 1996). Highest rainfall is recorded where the land rises from the coastal plain, and on the mountain ridge's western rim. The eastern highlands and the Jordan Valley are rain shadow areas. Table 1: Water Flow in the Various tributaries of the Jordan River System

Source or Body of Water	Average Flow (mcm/y)
Hasbani River	157
Dan River	258
Banias River	157
Upper Jordan River	640
Jordan River outlet from Lake Tiberias	538
Yarmouk River near confluence with River Jordan	475
Wadis on east side of Jordan River below Lake Tiberias	123
Wadis on west side of Jordan River below Lake Tiberias	145
Jordan River at Allenby Bridge	1250
Source: Main, 1953	

Surface Water

The Jordan River international drainage basin offers precious water resources to all its riparians: Palestine, Israel, Jordan and, to lesser extents, Syria and Lebanon. The chief headwaters of the Upper Jordan are the Dan, Hasbani and Baniyas Rivers, which rise in Israel, southern Lebanon and the Golan Heights respectively (Table 1). These sources feed Lake Tiberias, below which the lower Jordan flows into the Dead Sea. Hydrologically, Lake Tiberias is the major regional water reservoir in the international Jordan River basin. It has a storage capacity of 4,000 mcm and receives an average annual replenishment of about 840 mcm from the Upper Jordan, local runoff, adjacent springs and local rainfall. The Yarmouk River is also an integral part of the Jordan River international drainage basin. Its headwaters join the Jordan River 10 km below Lake Tiberias. In addition, a number of minor tributaries and springs in Jordan, Israel and Palestine feed the lower Jordan and the Dead Sea, from which there is no outflow. Figure 1 shows a map of the Jordan River basin as well the various surface water sources that contribute to the Jordan's discharge.

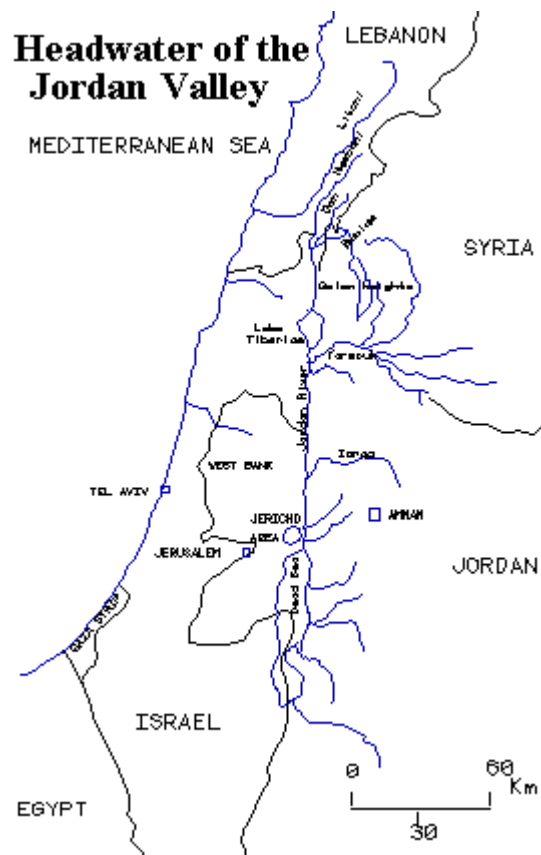


Figure 1: Surface Waters of the Jordan River Basin

Groundwater Resources

The Jordan basin is not, however, the only water resource to which Israel and Palestine are co-riparians. Groundwater is the most important source of fresh water supply in the area and consists of the main aquifer systems that are located and recharged from rainfall in the West Bank. The annual rainfall in the West Bank is estimated at 2,597

mcm. Around 600 mcm of this rain is estimated to infiltrate the soil to replenishes the aquifers annually. The remainder is lost either through surface runoff or evaporation.

The system of aquifers under the West Bank comprises several rock formations from the Lower Cretaceous to the Recent age. The system is divided according to flow direction into the following three units:

1. The Western Basin which is the largest and has a safe yield of 350 mcm per year;
2. The Northeastern Basin which has an annual safe yield of 140 mcm; and
3. The Eastern Basin whose safe yield is 125 mcm per year.

The West Bank aquifers vary spatially in the quantities and quality of groundwater they yield. The hydro-geology determines the spatial distribution, quantity, quality and extraction cost of ground water. The Western and Northeastern basins contain two aquifers, while the Eastern basin contains six. In each case, aquifers differ in their depth from the ground surface and in the quantity and quality of water they contain. In these aquifers groundwater flow is dynamic, always moving down the anticline that constitutes the mountain range. Groundwater that is not extracted from an aquifer flows through that aquifer either leaving the system through springs or by entering an adjacent aquifer system.

The Gaza aquifer

Inflow Component	MCM/Y	Outflow Component	MCM/Y
Average recharge by rain	21	Domestic abstraction	32
Recharge from wadis	0	Irrigation abstraction	40
Groundwater from Israel	7	Industrial abstraction	1
Return flow (domestic)	13	Settlements abstraction	6
Return flow (irrigation)	18	Groundwater outflow	2
Brackish water inflow	20	Evaporation in Mawasy area	0
		Drop in groundwater table	-2
Total	79	Total	79

Source: Ministry of Planning and International Cooperation, 1996

Gaza Strip receives an annual average of 325.7 mm of rainfall, totaling over the Strip's area to 117.25 mcm per year (Table 2). The groundwater system is composed of a number of sub-aquifers made up mainly by Quaternary sands, sandstones and pebbles. The annual capacity of Gaza's aquifers is estimated around 65 mcm.

ELEMENTS OF THE ARAB ISRAELI WATER DISPUTES

Water allocations

The riparians of the international Jordan River Basin are Lebanon, Syria, Palestine and Jordan. At present, Israel has control over the major part of the Jordan basin waters (Figure 2). Through its control in southern Lebanon, Israel is able to limit Lebanese exploitation of the Hasbani River. Through its occupation of the Syrian Golan Heights, Israel controls the Baniyas River and minor eastern tributaries of Lake Tiberias. Israel

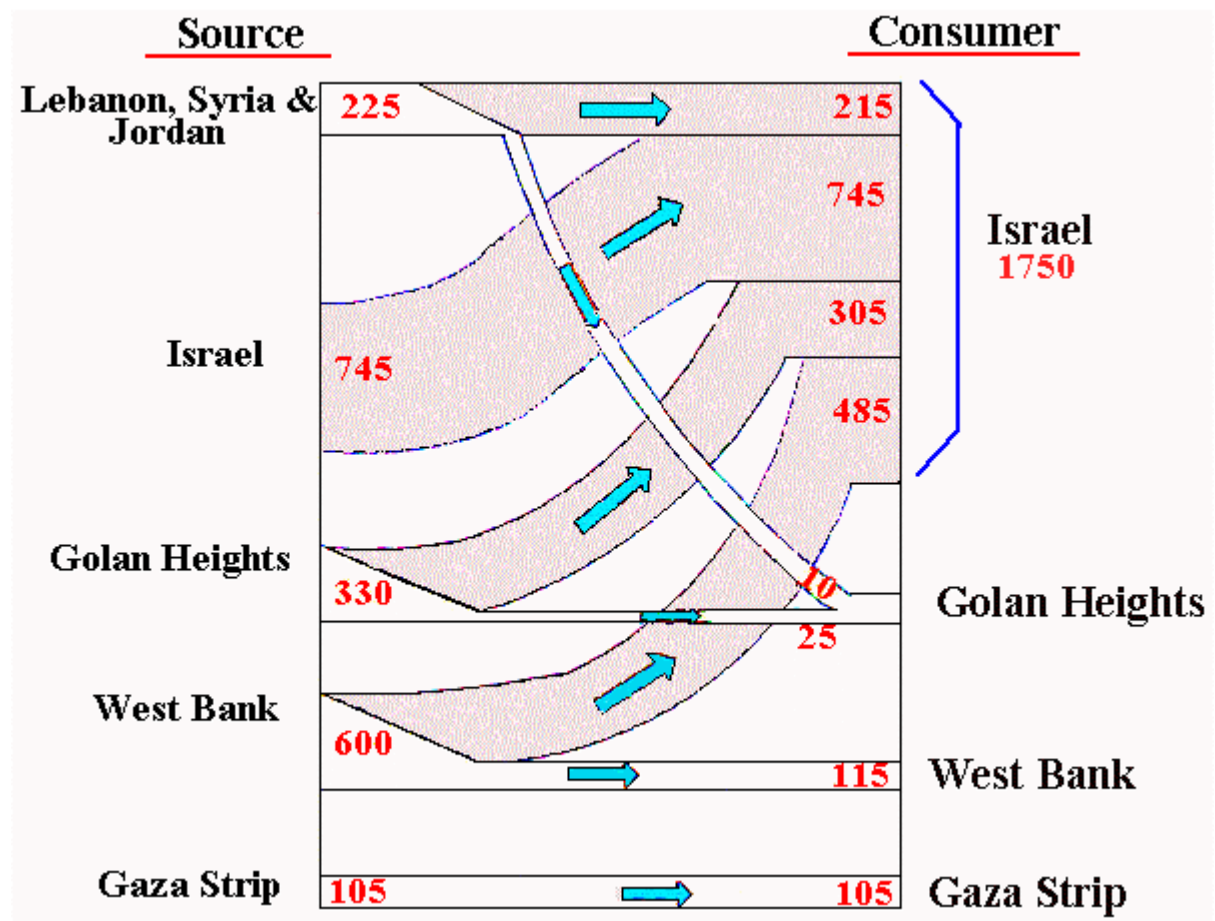


Figure 2: Sources and Consumers of Water Resources in the Occupied Arab Territories and Israel

Source: Modified after USIS, 1991

siphons 470 mcm of its waters are siphoned off at Lake Tiberias into the Israeli National Water Carrier and another 450 mcm are siphoned by the Israelis, Syrians and Jordanians from the Yarmouk River, leaving the downstream Jordan but a fetid trickle. Redirecting the greatest part of the Yarmouk river to the Eastern Ghour canal and pumping the rest to Lake Tiberias resulted in a major drop in lower Jordan. Palestinians are denied their rightful shares of the water in the Jordan River as riparians.

Following the 1967 occupation, Israel applied stringent policies that prevented Palestinians from fully exploiting the West Bank's groundwater. These included the expropriation of wells belonging to absentee owners, denial of granting permissions for new wells, and imposing rigorous water quotas. Figure 3 shows the current extraction from the West Bank aquifers.

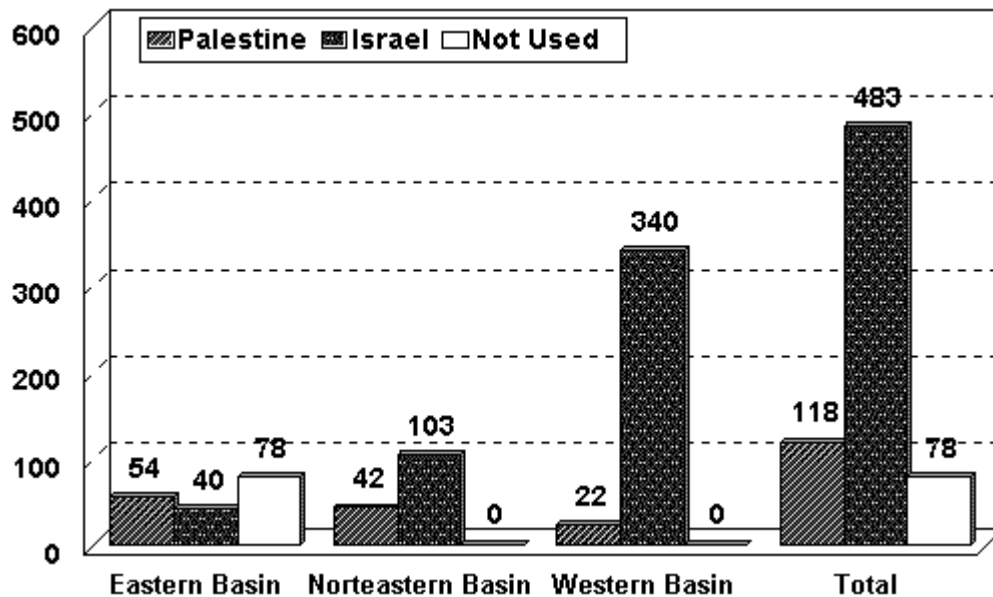


Figure 3: Extraction of Water from Groundwater Basins in the West Bank

Ground water in Gaza, which is estimated to have a potential of 65 mcm per annum is the only source for fresh water. At present, more than 100 mcm are pumped from these shallow aquifers which resulted in the gradual invasion of seawater into Gaza aquifers (Table 2). Many hydrologists believe that the Gaza aquifer has already passed the point of no return. Palestinians blame Israel for the degradation of their aquifer using the following arguments:

- Israel is pumping water from the coastal aquifer north of Gaza causing a decline in the safe yield of the aquifer.
- Israel is diverting the Wadi Gaza waters which replenish the Gaza aquifer.
- The 3000 Jewish settlers in Gaza are utilizing more than 5 mcm annually while the close to million Palestinians are utilizing the rest.
- Settlements are located on top of the only fresh water sources in Gaza.
- The over-pumping in Gaza is mainly due to the population displacement caused by Israel's expulsion of Palestinians in 1948.

Sea water intrusion is already occurring and tests are showing increased salinity levels to, in some cases, greater than 1,500 ppm of chloride making water unsuitable for drinking (Shawwa, 1993).

Due to the restrictions on water allocations imposed by Israel, the water situation in Palestine is approaching a critical phase which is threatening the livelihood of the Palestinian population and hindering economic development. It is evident that the Palestinian water rights should be given utmost priority.

Palestinians define their water rights as follows:

1. Natural rights of the Palestinian people in the Jordan basin as a main riparian. Although Palestinians are full riparians to the Jordan River, they have been denied rights to its water. Under the Johnston Plan, the proposed West Ghour Canal would have supplied 150 mcm from the River to the West Bank, but plans were never carried out.
2. The legitimate rights of the Palestinian people for full compensation for all damages caused by the Israeli illegitimate practices of depleting Palestinian water resources and for the foregone income over the past 27 years.
3. Storage and fishing rights in Lake Tiberias. Lake Tiberias is part of the Jordan River Basin. According to international law, Palestinians have storage and fishing rights because of their status as riparians to the Jordan River.
4. Full sovereignty over all the Eastern Aquifer water resources, as this aquifer is entirely located beneath the West Bank and is not a shared water resource.
5. Equitable water rights in the western and northeastern aquifers, as these aquifers are recharged almost entirely from the West Bank.
6. The Mediterranean and the Dead Sea. Rights of access to the Mediterranean for fishing, port development, and shipping is essential for the development of the fishing industry and for international trade. The Dead Sea represents an important natural resource and tourism area for Palestinians as full riparians.

The current water allocations have not been negotiated, but rather taken by force. The resolution of the Palestinian-Israeli allocation and water rights disputes will necessarily be governed by the principles of international law. Negotiations over allocations and water rights should be conducted with an eye on justice rather than might, and independent arbitration may be necessary. The international community and financial institutions should be asked to make clear to all parties that loans for international waterway projects will not be forthcoming until the agreement is negotiated.

Water and agriculture

Despite the fact that the Middle East is a water scarce region, over 70 % of the water resources are used in agriculture. Large percentage of the agricultural areas in the region is irrigated, especially in Israel where its portion of irrigated agriculture exceeds other water-rich countries as Lebanon and Syria (Figure4). Such extravagant dependency on irrigated agriculture is imposing exacerbated demand on water resources. Proper water management is therefore essential to ensure optimum

utilization of this valuable resource. Optimization of water use for irrigation, development of rain fed farming, cultivating low-water consuming crops, and reducing water subsidies are effective trends for proper use of water in the water-scarce area of the Middle East.

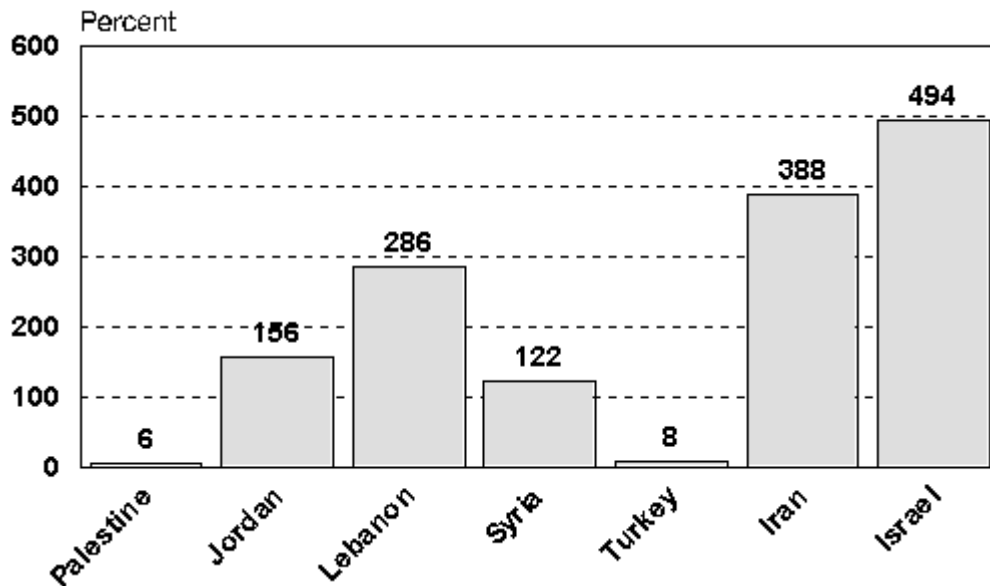


Figure 4: Percent of Agriculture Land That Is Irrigated

Promoting rainfed farming in the region may save thousands of million cubic meters of water, especially in countries where agriculture is minimally contributing to the GDP, as the case in Israel. Despite the immense quantities of water that are used by Israel for agriculture, this sector contributes 2.4% to the GNP while in Palestine agriculture contributes 30% to the GNP. The agricultural sector employs 3.3% of the working force in Israel compared to 25% of the working force in Palestine.

Water Supply and Demand

There is a growing need for water to meet the needs of an increasing population and standards of living in the Middle East. A serious discrepancy exists in the amounts of water supplied to Palestinians and Israelis due to the restrictions imposed by Israel (Figure 5). With regard to total water consumption, an Israeli uses 370 cubic meters per year (CM/year), a Palestinian uses 107-156 CM/year, while a Jewish settler uses 650-1,714 CM/year (Gleick, 1993; Isaac *et al.*, 1994).

Israelis use around 483 MCM/year from the West Bank waters per year while Palestinians are using only 118 MCM/year of their own waters. Currently, around 25 % of the population in Palestine has yet to be connected to household water distribution systems. Israeli settlements receive continuous water supply, largely from wells in Palestine, and are provided service of greater quantity per capita than that received by Palestinians in the West Bank and Gaza Strip. When the low monthly quota levels for Palestinian municipalities and towns are approached, the remaining

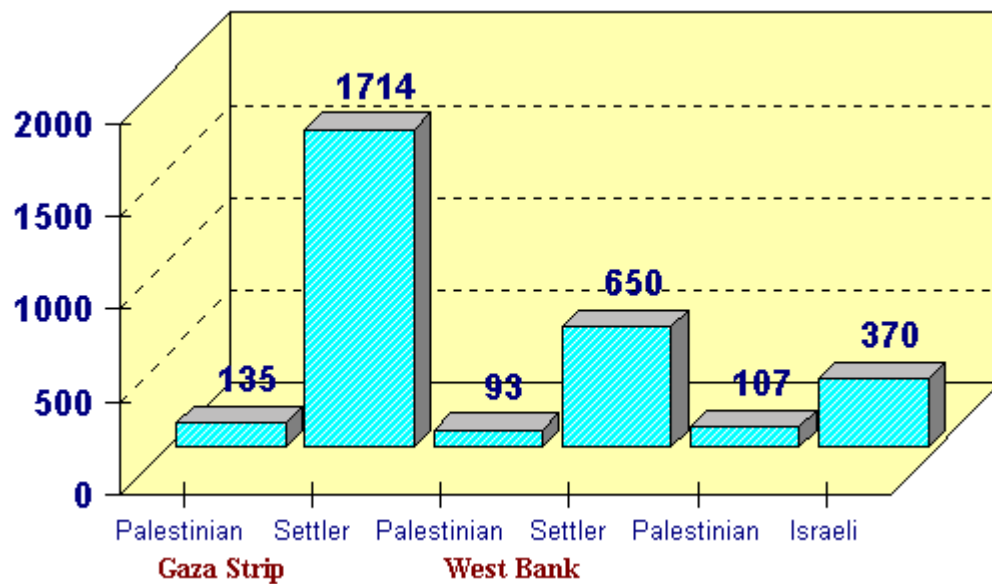


Figure 5: Differences in Water Consumption Between Israelis and Palestinians in CM/Year

supply is constricted, and communities are left without water for extended periods of time. Heavy fines are imposed by the Israeli Civil Administration for pumping beyond the low quota levels. The discrepancy is not only limited to water quantities, but is extended to water pricing.

Table 3: Population Growth Projections for Israel and Palestine

Year	Israel	Gaza	West Bank	Palestine
1990	4,559,000	711,000	1,326,000	2,037,500
2000	6,023,000	1,162,000	2,289,400	3,451,900
2010	6,695,200	1,639,900	3,317,000	4,776,900
2020	7,457,200	2,203,900	4,015,600	6,219,500

Source: Central Bureau of Statistics various issues; Eckstein and Fishelson, 1994; Isaac et al., 1994.

The prospect of substantial increases in water demand in the coming years renders it absolutely imperative to find a solution to Palestine's water shortage. Both Israel and Palestinian populations are expected to increase dramatically (Table 3), and population increase is bound to heighten demand on water resources.

Table 4: Projected Sectoral Demand for Palestine

Year	Domestic	Agricultural	Industrial	Total
1990	78	140	7	225
2000	263	217	18	495
2010	484	305	37	826
2020	787	415	61	1,263

Source: Isaac & Selby, 1996

Demand projections for Palestine are shown in Table 4. The calculations are premised upon the population growth projections given above, and upon the lifting of current restrictions on water supplies. Thus the projections assumes both a larger population and increase per capita water demand. Industrial water demand is expected to increase at a rate of 10% up to the year 2000, declining thereafter. This pattern reflects a rise in the volume of the tourism and construction industries, which are likely corollaries of the lifting of occupation in the West Bank and Gaza Strip. The projections for agricultural water demand, meanwhile, are premised upon the expansion of irrigation to areas that are well-suited for irrigated agriculture, and upon Palestinian utilization of land that is currently irrigated by Israeli settlers.

Re-allocation, in itself, would be an insufficient means of averting conflict over water resources. An increase in supply relative to demand must be achieved - either through enhancing supplies or reducing demand, or through a combination of both approaches.

Enhancement of Existing Supplies

After reaching settlement on water rights and allocations mentioned earlier, it is possible to further enhance water resources through developing large-scale projects, involving the import of water. The several megaprojects which have been proposed, include a Med-Dead Canal, a Peace Canal from Turkey, importing water in medusa tanks, a Nile-Gaza canal, and several others. These proposed projects are mostly unsustainable, politically unacceptable, and costly. Hence, it may be wiser to focus on enhancing supplies internally, through:

1. The rehabilitation of springs and groundwater wells;
2. The utilization of water harvesting methods, such as cloud seeding;
3. Wastewater treatment;
4. Desalination and mixing water of differing salinity;
5. Natural and artificial recharge of aquifers; and

Water quality

In general, water from West Bank aquifers is of good quality and, if used judiciously, can provide enough water to sustain the projected household requirements approximately over the next thirty years, supplementing supplies in areas where

resources are of insufficient supply or quality. The aquifer under the Gaza Strip, in contrast, is seriously polluted and becoming unsuitable for domestic use, except in the northern parts of the Strip.

Wastewater is a major area of concern, both from the perspective of pollution of available water resources, and as a potential area for increasing water use efficiency. The amount of domestic wastewater generated in the urban areas of the West Bank is estimated at 45 MCM per year. Assuming that 70% of this water could be collected and treated, then there is a potential of having 13 MCM that could be used for irrigation, as indicated in Table 5.

For rural areas, microsystems of septic tanks could be promoted which will allow efficient management and re-use of waste water.

Impact of the Settlements

Israel adds to the wastewater problem significantly as the thousands of settlers living in the West Bank and in East Jerusalem generate waste that is disposed without proper

District	Wastewater Production (MCM)	% Population Using Cesspits and Open Channels	% of Population Connected to Sewage Network	Wastewater in Sewage Collection Network (MCM)
Tulkarm	6.4	70	30	1.9
Nablus	13.1	51	49	6.4
Jenin	3.8	87	13	0.3
Ramallah	4.9	78	22	0.7
Jerusalem	7.7	84	16	0.8
Jericho	1.6	0	0	0
Bethlehem	2.6	91	8	0.2
Hebron	4.7	45	55	2.6
TOTAL	44.8			12.9

treatment. As the use of water for Israelis is significantly higher than for Palestinians, so is the amount of waste that they generate. Settlers use an annual average of 100 CM of water for domestic use . This amount of water which is used by the 306,806 settlers in the West Bank, including the 170,00 in East Jerusalem, may generate 30 MCM of wastewater per year.

Although information about wastewater treatment in the settlements is not fully available, it is apparent that there is little treatment of wastewater. Wastewater is usually collected in a network and then freely sent out of the settlements to the surrounding land. In several places in the West Bank this waste passes through villages causing many problems, in other places it joins the wastewater generated by the Palestinians and travels through the wadis. In all cases, free dumping of raw sewage in valleys impose a serious threat to the groundwater aquifers.

The establishment of wastewater treatment plants will be an important element in shifting freshwater resources to domestic use and in helping solve the problem of waste contamination and disposal. It is estimated that 70% of domestic wastewater could be treated to levels appropriate for use on vegetable crops and for industry. In Gaza City, for example, approximately 15 mcm of wastewater are treated, but at present are not reused. The flow of wastewater into Wadi Gaza presents both the health risk of contamination to underlying aquifers and the loss of a potential recycled irrigation and industrial resource.

Because of the aquifers' shallow depth and high permeability, treated wastewater should be used for agriculture in only southernmost Gaza where there is no potential of contamination to the aquifer. The north Gaza aquifer should be kept free from any possible contamination resulting from recycled wastewater.

DEMAND MANAGEMENT: CONSERVATION AND APPROPRIATE UTILIZATION OF WATER SUPPLIES

Conservation of water through enhancing supply and guiding consumption is essential to increase the efficiency of utilizing the scarce water resources in the region. Conservation of water could be further engendered through the elimination of water subsidies and by selling water according to its real cost, similar to other market commodities. Presently, water is being sold at a subsidized rate in most Middle Eastern countries. Taking into consideration the present water crisis, it is essential for the Middle East states to assess the feasibility of subsidizing water for agriculture and whether such subsidy constitutes an economic burden, and a profligate use of precious water resources.

Improving water supply systems and irrigation technologies is vital. Within agriculture, the introduction of drip irrigation, improved crop varieties and more water efficient crops would be a further step toward optimizing available water resources. Rainfed farming should also be developed and promoted. Rainfed lands currently account for 95% of the West Bank's cultivated area, and this could serve as an example to other states (ARIJ, 1994).

Improving water conveyance systems and water distribution service to international standards, may also assist in conserving water. Water networks in most Palestinian communities are old and deteriorating., causing a water loss due to leaking. This water loss is estimated at 40% of the water passing through these systems. As a priority, the maintenance of the existing water networks is therefore essential and may save Palestinians additional water quantities and provide efficient utilization of the available resources.

It is also essential to extend the water supply networks to the remaining 25% of the Palestinian communities that are still not connected to piped water supply. In the long run, a Palestinian water carrier that will connect the various districts of Palestine with one major network is needed.

With increases in service levels must come programs targeting conservation and awareness to meet projected demands and to emphasize efficiency in utilization. Low-flush toilets, for example, can significantly reduce water volumes consumed.

NATIONAL WATER INSTITUTIONS AND INTEGRATED MANAGEMENT

It is rather regrettable that so far Israel has not transferred the responsibilities and authorities of the West Bank water department to the Palestinian Authority, as stipulated in Article 40 of The Oslo II Agreement. Nevertheless, a Palestinian Water Authority (PWA) has been recently established and is mandated to deal with all water related issues, including waste water.

The PWA is currently working on developing a full legal and institutional program to exercise its powers and responsibilities. It will have full responsibility for planning development legislation and monitoring of the various water resources. However, water distribution will be delegated to water utilities in the various regions of Palestine. It is very important that coordination exists between the PWA and the Ministry of Agriculture, and this has been guaranteed by the formation of the Palestinian Water Council which comprises representatives from the ministries of agriculture, local government, planning and international cooperation, in addition to PWA and universities.

It is essential to create an infrastructure in Palestine which would enable a sound and integrated management of the available water resources. Information is a key factor in this process. Establishing water monitoring stations and an information network which would feed the PWA with vital data required for planning and policy formulation is a priority. A multi-disciplinary water information database which is integrated with a powerful Geographic Information System (GIS) could also provide the PWA with tools for analysis and planning. Such system could allow the modeling of ground and surface water in regard to quality and quantities, through which outcomes for proposed water projects and policies can be projected and evaluated. Social and economic factors could as well be integrated in the system to display a comprehensive and inclusive representation of the water sector in Palestine.

WATER AND PEACE

It is now almost four years since the initial peace conference at Madrid was inaugurated. So far, a peace treaty has been reached between Israel and Jordan in which the water dispute between the two states was resolved based on mutual recognition of the "*rightful allocations*"; of both parties to the Jordan and Yarmouk Rivers as well as the Araba ground waters. Israel, however, has failed so far to deliver to Jordan 50 mcm that were agreed upon. There is no doubt that this bilateral

agreement will not be a substitute for an integrated and comprehensive agreement among all riparians to the Jordan River basin.

On the Israeli Palestinian track, water was one of the major sticking points in the negotiations leading to the signing of the interim Agreement (Oslo II) in Washington last September. Water is referred to under article 40 of Annex 3 " Protocol concerning Civil Affairs" of the Agreement. The first principle in the article dealing with water and sewage states that *"Israel recognizes the Palestinian water rights in the West Bank. These will be negotiated in the permanent status negotiations and settled in the Permanent Status Agreement relating to the various water resources."* There is no doubt that this may be considered as an important breakthrough as it is the first time that Israel has recognized the Palestinian water rights. While the Agreement did not go into the details of the Palestinian water rights, the use of the term *"various water resources"* in the second sentence is very significant.

While this recognition is a very important step forward, the second and third principles in the Agreement attempt to undermine the significance of this issue by talking about maintaining existing utilization and recognizing the necessity to develop new resources, tacitly accepting that more water is needed to satisfy the needs of both populations. The Agreement states that *"all powers currently held by the civil administration and military government relating to water and sewage will be transferred to the Palestinians, except for those specified as issues for the "final status negotiations."* However, the Israeli authorities have not transferred the authority of the West Bank Water Department to the Palestinian Water Authority until now.

Furthermore, the agreement states that the future needs of the Palestinians in the West Bank are estimated to be between 70 - 80 mcm/year. This statement is ambiguous and may be interpreted differently by different people. In reality, this amount merely expresses the immediate needs of the Palestinians to satisfy domestic demand during the interim agreement period, without considering future development of other sectors such as agriculture, industry or tourism.

Out of the recognized amount of 70-80 mcm/year, Israel offered the Palestinians 28.6 mcm/year to meet their immediate needs during the interim period, in the manner detailed below:

1. Additional supply to Hebron and the Bethlehem area, including the construction of the required pipeline - 1 mcm/year.
2. Additional supply to Ramallah area - 0.5 mcm/year.
3. Additional supply to an agreed take-off point in the Salfit area 0.6 mcm/year.
4. Additional supply to the Nablus area - 1 mcm/year.
5. The drilling of an additional well in the Jenin area - 1.4 mcm/year.
6. Additional supply to the Gaza Strip - 5 mcm/year.
7. An additional well in the Nablus area - 2.1 mcm/year.
8. Additional supply to the Hebron, Bethlehem and Ramallah areas from the Eastern Aquifer or other agreed sources in the West Bank - 17 mcm/year.

The capital cost of items (1) and (5) above shall be borne by Israel, and the rest by Palestinians.

The remaining quantities are to be developed by the Palestinians themselves from the Eastern Aquifer and other agreed sources in the West Bank.

By reviewing the details of the Oslo II agreement on water, it becomes clear that Palestinians were given very little. In fact, the 28.6 mcm/year of water which are to be supplied to the Palestinians by Israel are neither a gift nor an additional water resource. Palestinians are paying the full cost of the 5 mcm of water supplied to the Gaza Strip. On the other hand, the 4.5 mcm/year of water given to the West Bank, originate from the Eastern Aquifer, which is, by the definitions of all international laws, replenished and owned by Palestinians. In addition, the tapping of the additional water from the Eastern Aquifer is currently difficult and may not be economically feasible, considering the depth of the Eastern aquifer and its complicated topography. Also, work on the drilling new wells agreed to by Israel to meet the needs of the Palestinian community are stalled. So far, the Palestinians in the West Bank and Gaza Strip have not seen the translation of this Agreement to water in their taps, but are witnessing severe water shortages.

The agreement on water was described by Prof. Frank Fischer, a prominent Jewish water economist from MIT, as shameful. The suppressed Palestinian water demand will remain and the little addition of water will not accommodate natural population growth, absorption of Palestinian returnees, improved living standards or development of the various Palestinian economic sectors.

SOME PRACTICAL SUGGESTIONS

The current peace process offers a special opportunity for all nations in the Middle East to abandon the existing states of belligerency, confrontation, non-cooperation and polarization. The ultimate objective is to arrive at a comprehensive, just and lasting peace in the whole region where all the peoples of the area can join their efforts to develop the area and promote progress and prosperity in the region. Water will be a major issue that can catalyze the peace process or inhibit it. Unfortunately, the recent political changes in Israel has brought into power those who are obsessed with "water security" and are advocating the retention of Arab waters in Israel's control. While in principle, the resolution of the Middle East water allocations and disputes will be based on the principles of international law, there is no mechanism for this issue to be institutionalized. If the issue of water allocation continues to be addressed with an eye for might rather than justice, Arabs will remain the thirsty partner to an unjust peace. And, as is so often pointed out, an unjust peace is no peace at all. Words, however, are not sufficient: declarations alone, no matter how detailed, cannot solve the problems of Gaza Palestinians who have no access to clean water. No Gaza Palestinian will be too impressed by the recognition of intangible rights, by the consideration of proposals or by the establishment of a regional water data bank. Concrete action is needed.

Until water disputes are resolved in the final status negotiations, concrete confidence building measures should be taken by Israel to unequivocally show its commitment to resolving the allocation problem and desire for a just and equitable solution to the riparian dispute with the Palestinians. These measures should include supplying Gaza Strip with 50 MCM of free of charge water from the Israeli National Water Carrier in

partial recognition of Palestinian water rights; increasing the per capita share of water for Palestinians in the West Bank to internationally accepted quantity;

Until this happens, there are several small steps that can be initiated at national, regional and international levels to facilitate the work of the political leaders of the region including:

1. Make all available water data in the region accessible through improved communication networks and web sites (e.g. an On-Line Water Information Network);
2. Encourage open forums (workshops, conferences, meetings) to discuss all aspects of the Middle East water issues at national, regional and international levels;
3. Promote the capacity building of the regional parties in the area of integrated water management;
4. Develop simulation models that could assist decision makers in the region in policy formulation, planning and negotiations;
5. Promote the participation of water planners, distributors and users in decision making;
6. Invite the private sector to assume a leading role in the water services;
7. Promote R&D in the region aimed at transferring new water technologies;
8. Train a number of economists in the region in the fields of water and environmental economics;
9. Restructure the water policies at the national level;
10. Introduce conflict resolution mechanisms and options at different levels within the region; and
11. Share with the regional parties the international experience in water dispute resolution and joint management of international river basins and ground water aquifers

In sum, the current water situation is unsustainable and unless action is taken to alleviate the fears of the Arabs of a dry peace, accomplishments of the last few years will evaporate, bringing the region to a new war.

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