Hydro-Political and Legal Negotiating Strategies for Jordan at the Bilateral and Multilateral Stages of the Peace Talks with Israel
(with selected data)

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Contents

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I. The Premises

The proposals are based on the following premises:

1) For the foreseeable future, Jordan will have to function in the absence of a formal agreement among the riparians of the Jordan basin for equitable sharing of the basin's waters, and in the absence of trust among them as well. "Equitable" in this context does not mean equal, rather fair apportionment on the basis of demonstrated need, demographics, uses, economic development, legal rights, etc.

2) Therefore, negotiating objectives and strategies must be formulated on the basis of whatever substantive goals can be attained without trust or treaties, and in the face of Israel's superior power, riparian position, and interest in maintaining the status quo. Thus, the basic question to be negotiated becomes: What incentives can Jordan offer, or what power can Jordan use, to persuade Israel to accept changes in the status quo that allow Jordan to achieve its goals?

3) Water issues associated with the Occupied Territories are integral to any hydro-political negotiations concerning the Jordan basin. They must therefore be an integral part of Jordan's negotiating strategies.

4) Compliance observability, i.e., effective means for ensuring compliance with any terms that are agreed upon, must be built into any strategy and be emphasized at every stage of the negotiations. Where some water issues are concerned, the quality of satellite remote sensing improves observability significantly and could reduce the potential for political wrangling.

5) In many respects, Jordan is in a highly vulnerable, if not weak, bargaining position and will not only be at risk, but almost certainly will have to take some risks.

II. Strategies: General Considerations

1) Although Jordan's immediate bilateral negotiating counterpart will be Israel, several other significant actors—Syria, the Palestinians, and, at a further remove, Lebanon—will, it is understood, be taken into account at all times; coordination, if not alignment, with their approaches and tactics will be considered. As will be emphasized elsewhere, Jordan must also never lose sight of the effect that its strategies and positions will have on the U.S. and other important members of the international community.

2) In general, while the negotiations in the second stage will formally be bilateral, the more the four basin riparians can coordinate their policies and tactics, the greater their influence is likely to be, and the better Jordan's position. Israeli tactics will certainly aim at fracturing such unity. The bilateral format itself, on which the Israelis have insisted, attests to that intention.

3) The major indirect actor in the negotiations is the United States, whose good will and offices will be crucial to Jordan and the Palestinians. Jordan's strategies must be designed as far as possible to produce in the first instance a good effect on the U.S., and in the second instance upon the E.C. and other members of the international community. That nebulous factor called "world opinion" is likely to play a critical role in the fortunes of the weakest actors in the negotiations, as will the public opinion within each participating nation. All of these various levels of opinion must be considered at all times, a fact which compounds the calculations that go into formulating a negotiating strategy.

4) These circumstances create a situation of difficulty for Jordan (and all the other actors). Jordan must play out its negotiating strategies on several—not necessarily compatible—stages simultaneously. Jordan will be negotiating directly with Israel while also striving to produce positive effects on the U.S., on its own citizens, and on world opinion. This is necessitated by the fact that Jordan has very little direct negotiating leverage over Israel and therefore has to muster greater influence indirectly through the U.S. and any other actors in a position to lend Jordan some strength.

5) It might be argued that the main bargaining relationship for Jordan in the peace talks is not with Israel but with the U.S. and its allies who constitute the most likely source of significant influence on Israel and who are simultaneously the source of economic assistance that Jordan needs so urgently. Thus, by this scenario, Jordan's strategy might be to use the Israeli nexus as an instrument for producing desired policies from the Americans, Europeans, and possibly the Japanese.

6) Analysis must be made of the positions of each of the key actors, primary and secondary, and of other negotiating partners for each of the relevant issues of concern to Jordan (these are discussed below)—i.e., their goals, perceptions, power resources, and tactics—and goals should be placed in order of priority. Such an analysis would produce a general strategic clarification and reveal strategic discrepancies, and comparative power advantages.

7) Strategic discrepancies provide a prime basis for negotiation and bargaining. A strategic discrepancy may be said to exist when a given aim or priority of one party is given a higher ranking or evaluation than by the other. When this occurs, it is usual for the party assigning the lower ranking to a goal to compromise in order to gain a reciprocal concession on one of its higher-valued aims which is lower on the priority scale of the other negotiant. For example and purely hypothetically, if Jordan were to consider a power generating canal from the Dead Sea to the Red Sea to be a less important priority than did Israel, Jordan would be in a position to negotiate a compromise on that issue in return for a concession on one of its higher priorities, e.g., the Wahda Dam, that might be lower on Israel's list of goals. Because movement is possible over strategic discrepancies, it is at those points that stress should be placed in the negotiations.

8) Once the comparative power advantages of the negotiating parties are known, a calculation can be made as to where the greatest strategic advantages lie and therefore where to concentrate efforts. Apart from relative motivations, it may be expected that the actors will vary their strategic positions in relation to or across the various objectives. There are some circumstances when it is wiser to pursue a goal of somewhat less importance but greater prospects of success than the reverse.

9) For Jordan, the best strategy may not be to expend all its efforts at trying to wring significant changes in the status quo from Israel—a very difficult and probably fruitless task at best—but rather to set as its most important goal of the negotiations to win the sympathy and support of those nations whose help it so pressingly needs to deal with its paramount economic problems. (This matter is discussed further below under specific negotiating strategies.)

III. Hydro-Political Issues to Be Negotiated: Part I, Jordan's Perceived Needs

Jordan's major hydrological needs are all taken to be interrelated and are listed below in a rough order of importance. Where relevant, they are followed in brackets by a probable Israeli position on the issue.

1) Jordan will need approximately 250 Mcm/yr of new water between now and 2005, assuming no increase in irrigated agriculture. By 2020 that need could rise to as much as 400 Mcm/yr if the population growth rate remains at its current 3.7%/yr (a rate that would double the population every 18 years).

2) The Wahda Dam project must be completed as soon as possible to ensure adequate water supply for domestic use and industrial development by the end of the decade. A significant portion of Jordan's future economic viability depends on Wahda Dam. If Wahda is to fulfill its purpose, Jordan must have available enough flow in the Yarmuk river to fill the dam's reservoir, designed for 195 Mcm. *[Israel will continue to take 100 Mcm/yr out of the Yarmuk river, especially if the current shortage persists. This withdrawal, combined with what the Syrians take, will reduce the water available for the dam's reservoir significantly below the 195 Mcm needed for Jordan's economic development. If the situation could not be altered, Jordan would have to settle for a very slow fill time and long carry over. Either way, Jordan's economic needs could not be satisfied.]*

3) Jordan needs to be able to use the lower stem of the Jordan river, for which it can lay certain legal claims. This can be accomplished only by persuading Israel to divert the saline waters around Lake Tiberias into the Dead Sea instead of dumping them into the lower Jordan as at present. *[If Israel for any reason chooses to clean up the lower Jordan, its own critical water shortage could cause it to use the lower stem for its own purposes. Israel can be expected either to counter any Jordanian legal arguments with a battery of its own or to ignore them altogether unless pressured otherwise by the world community, especially the U.S.]*

4) Jordan needs to free itself from so great a dependence on oil as at present by generating more hydroelectric power. Such an enhanced energy source would be important to the fulfillment of economic development plans and to any desalination projects in the Aqaba region, as limited as they might be. Given that the greater portion of electricity from the Wahda Dam would go to Syria, this leaves Jordan with two options: a) a gravitational canal from the Dead Sea to the Red Sea (assuming the "Med-Dead" canal idea remains moribund) and/or b) an interbasin transfer of water from south Lebanon, which would also be used for other purposes, assuming that Lebanon's own recovery and development program does not require all of the variable surplus that presently exists. *[Israel presents a serious obstacle to both schemes. The "Dead-Red" canal would require Israeli cooperation, and Israel controls the significant watercourses of south Lebanon, namely the Litani and Awali. In May of this year Israel announced that it would not leave south Lebanon without assurances that it would receive its "share" of the Litani. Moreover, Israel has stated that it would react with extreme hostility to any*

measures that would preempt future Israeli use of the waters of southern Lebanon.]

5) Jordan must provide sufficient water for irrigation while maintaining a proper balance among all the economic sectors and overcoming current and projected annual water deficits. This will require success in achieving a combination of the above-cited goals, strict efficiency and conservation measures, adoption of more water technologies, and very likely such out-of-basin transfers as a mini-pipeline from Turkey or desalinated water from the Gulf, provided the Gulf states can be persuaded to use their considerable wealth and excess energy to desalinate water for export. *[Israeli cooperation would be needed for a mini (or "maxi") pipeline from Turkey. Abatement of Israeli hostility would be necessary to assure secure transfers of desalinated water from the Gulf.]*

IV. Hydro-Political Issues to Be Negotiated: Part II, Israel's Strategic Advantages and Perceived Needs

Jordan's position in light of Israel's advantages and needs is indicated, where relevant, in brackets.

1) Israel is the hegemonic military power in the basin and is loathe to give up any of its territorial and hydrological advantages. Indeed, Israel has given no signs that it sees any purpose in giving up any of the advantages it enjoys in the status quo. *[Jordan, having given up its claims to the Occupied Territories, no longer has any outstanding territorial problems with Israel (save, perhaps, for Jerusalem in a secondary way). Its hydrological claims are significant, however, and Israel's overwhelming strength coupled with its hydrological controls severely limits Jordan's negotiating leverage.]*

2) Israel controls the major sources of the Jordan river—in the Golan, as upper riparian, as well as the Hasbani and Dan rivers. Control of the Golan Heights also gives Israel a significant strategic advantage and enables Israel to consume virtually all of the useable waters of the Jordan river. *[Israel uses this advantage to deny Jordan use of the Jordan river despite Jordan's legal rights to some its waters.]*

3) Israel takes about 100 Mcm/yr from the Yarmuk river. *[Unless Israel were to compromise on this issue, continued withdrawals at this level would make achieving the goals of the Wahda Dam impossible, and so too Jordan's successful economic development.]*

4) Israel uses some 500 Mcm/yr (or about 83%) of the waters of the Occupied Territories and depends on these supplies for between 33–40% of its

total annual stock of water. Consequently, it is extremely unlikely that Israel will enter into any agreement on the Occupied Territories that would deny it continued control over that supply of water. In the highly unlikely event that it were willing to compromise on the issue, it certainly would not do so without an iron-clad guarantee of a comparable amount from a proximate source, probably the Litani or the Awali. Without a satisfactory settlement of the hydrological issues in the Occupied Territories, Jordan cannot expect a political settlement over the Territories nor, therefore, a stable peace agreement. *[This not only complicates Jordan's negotiating position considerably but also its coordination with Palestinian strategies and aims as well. While Jordan's overall goal, like that of the Palestinians, is a stable peaceful resolution of differences with Israel, its primary objectives are not territorial but economic and hydrologic. This basic difference could frustrate coordination with the Palestinians, place Jordan on a divergent, incompatible negotiating path, and potentially generate tensions between the two negotiating teams.]*

5) Israel controls the Lower Litani and the Awali rivers and has been taking about 60–70 Mcm/yr (according to some sources 100 Mcm/yr) from a variety of sources in southern Lebanon; but Israel is not yet diverting the Litani. In light of Israel's stated position on the waters of south Lebanon (see item 4 above under Hydro-Political Issues, Part I), it must be assumed that Israel will insist on an apportionment of that supply as part of the price for withdrawal from its self-proclaimed security zone in Lebanon. *[This stance significantly complicates, if not frustrates, negotiation of a separate agreement of hydrological cooperation between Jordan and Lebanon, makes a political settlement more difficult, and keeps tensions high in south Lebanon.]*

6) Israel's water shortages are at a severe crisis point; its annual deficit is running at about 225 Mcm/yr and the total accumulated deficit is between 2000 Mcm and 2200 Mcm. (AMER's calculations of these deficits and those of TAHAL, Israel's water planning agency, are virtually the same.) *[This situation strengthens Israel's intransigence on water issues and makes negotiating compromises all the more difficult.]*

7) The immigration of Soviet Jews is already making the water shortage worse and will increase Israel's need for more water. Israel has clearly signaled its determination to keep all its present water holdings and to add whatever more is possible—by means of out-of-basin transfers, e.g., the proposed "peace-pipeline" from Turkey, from the Litani or Awali rivers, by "Medusa Bags," by more withdrawals from the Yarmuk, by large-scale desalination, etc. *[Again, this condition makes negotiating compromises all the more difficult for Jordan.]*

8) Israel, while not entirely immune, is highly resistant to external pressures for change or compromise. Despite what appeared to be a temporary setback on credit guarantees for settling Soviet emigres, Israel still exerts enormous political influence in the U.S., especially in Congress, and most especially in election years. The peace talks will certainly overlap with the 1992 presidential election. However, there are a few chinks in the Israeli lobbying armor. *[Jordan will have to work hard and skillfully to win sustained American sympathy for its position. It cannot assume that the U.S. will pressure Israel to help Jordan achieve its goals. Israel, for its part, can be counted on to be all the more assiduous in maintaining its political influence in the U.S. and to give as little as possible, particularly when feeling pressured or vulnerable.]*

V. Hydrological Issues to Be Considered in the Negotiations

There appear to be eleven possible hydrological points of contact between Jordan and Israel that could be placed on the negotiating table. These issues are of varying importance and feasibility and are evaluated in brackets after their descriptions.

1) Interbasin transfer of piped water from Lebanon. This is technically feasible and cost-effective. The water would be of relatively high quality and useable for both drinking and for irrigating a wide variety of crops.

2) Seawater desalination in the area of Aqaba. This is both desirable and feasible even though—in relation to Jordan's total needs—only a marginal (but important) amount of water would be produced. Jordan does not need Israel's cooperation for such a project, but there might arise issues of cooperation or opposition or competition should Israel attempt a similar undertaking at Elat. This is a real probability as it is official Israeli policy to invest in large-scale desalination this decade. *[This would constitute only a minor negotiating issue and could be used as a low priority item for bargaining purposes.]*

3) Cloudseeding over the eastern hills. This activity, which can be done unilaterally, is planned to begin soon in Jordan. This project too can be an issue of cooperation or objection, e.g., on grounds that Israeli cloudseeding denies Jordan atmospheric moisture, though there is little evidence to this effect. *[This would also be no more than a minor negotiating point to be used as a low level bargaining chip.]*

4) A Dead Sea to Read Sea ("Dead-Red") canal. This is a priority item for Israel because of the hydroelectric power such a canal would generate. Although some Israelis argue that Israel could undertake the project

unilaterally, Jordan's cooperation is needed not only for the canal to realize its full potential, but because Jordan must approve any alternations in the level of the Dead Sea. In this matter, Jordan is in a relatively strong bargaining position and would stand to benefit both diplomatically as well as from the hydropower it would receive. *[This is an instance of strategic discrepancy in Jordan's favor which Jordan can use to try to gain important goals and at the same time win points with the U.S. and other members of the world community.]*

5) Sharing the Banias river (Hermon Spring). Jordan may make a claim for sharing these waters, but not a very strong one. Israel, which controls the Golan Heights—a catchment for the Hermon Spring, which, in turn, feeds the Banias river—is not likely to take such a Jordanian claim seriously. Syria still claims the Golan as its territory and therefore will insist these waters are Syrian. Jordan's claim can only be on the basis that these waters constitute one of the sources of the Jordan river, which Jordan has a legal right to share along with the West Bank and Israel. *[This point is worth considering only as a secondary bargaining position, which would have more nuisance than substantive value, but in certain circumstances could prove to be handy.]*

6) Sharing the waters of the Hasbani and Dan Springs. This claim is of the same kind as item 5 above, with the exception that it does not involve a parallel Syrian claim. *[This clam is the same kind of secondary bargaining point as that of the Banias and would carry a similar value.]*

7) Claiming a portion of the Jordan's flow. Jordan has legal claims to some part of the Jordan river, and if it desires to try a bold maneuver at the peace talks the Jordanian delegates could lay claim to half of the river's flow, though such a move would stand little chance of success. However, in addition to a legal basis there is a sound hydrological principle on which to ground such a claim—environmental symmetry of the east and west banks of the river—reinforced by a parallel notion of economic symmetry. (These concepts are discussed more fully in the section X, Negotiating Strategies.) *[Such a claim could produce a condition of strategic discrepancy which would allow for some degree of negotiating room. Allowing for variations in flow data for a variety of reasons, Jordan could base its claim on the following facts: The flow of the Jordan above Lake Tiberias is usually given as between 400–500 Mcm/yr, but these figures do not take into account approximately 100 Mcm/yr removed from the lake. If this is reckoned, it may be said that the annual natural flow of the upper stem is as much as 600 Mcm/yr to which an average of 400 Mcm/yr from the Yarmuk may be added. (Though the current flow of the Yarmuk is running about 325-50 Mcm/yr owing to drought conditions, the principle remains the same.) The wadi flows from the east and west banks roughly balance one another. Thus, if Jordan is the riparian*

partner of Israel and the West Bank below the confluence of the Jordan and Yarmuk rivers and the riparian partner of Syria on the Yarmuk, then one-half the flow of each river should allow Jordan one-half the total flow of the Jordan or as much as 500 Mcm/yr.]

8) Receiving the cleaned-up flow of the Jordan lower stem. As previously stated, the lower stem of the Jordan has been rendered unusable owing to the diversion of the Lake Tiberias salt springs into that portion of the river in order to reduce the ppm of dissolved pollutants entering the Israeli National Water Carrier. These saline waters could be diverted around the river into the Dead Sea, thereby making water from the lower stem available to Jordan for agriculture. *[The difficulty of this scheme, as cited above, is that if Israel were to agree, it would in all likelihood seize the water to relieve its current shortage. As a countermeasure, Jordan could propose to have the entire diversion line run down the Jordanian side of the river. Then, assuming that Israel could for some reason be persuaded to accept such a diversion, should the Israelis refuse to share the water, or seize it for themselves, Jordan could turn the diversion back into the stream, rendering it useless again. For this reason, the Israelis probably won't agree, but a negotiating argument could be made for sharing on the principle that half a loaf for each actor is better than none, and Jordan would appear to the international community as the reasonable party and thereby score valuable public relations points.]*

9) Claiming four-fifths of the Yarmuk flow. The four-fifths figure allows for Syria's legitimate claim. Jordan has strong legal, economic, hydrologic, and geographical claims to the bulk of the Yarmuk's water. This claim has historically been recognized in the various development plans for the Jordan basin put forth this century, most notably the Johnston (or unified) Plan of 1955. As stated, this flow is essential for the Wahda Dam, which in turn is essential to Jordan's economic future. An economic destabilization of Jordan would present serious problems for Israel and for U.S. Middle East policy. *[This is an issue over which Jordan can take a tough negotiating stand. There is a good possibility that it will receive sympathy for its position from the U.S., the E.C., and such international agencies as the World Bank. Moreover, this issue affords another strategic discrepancy. For example, Israel could be offered Jordan's half of a cleaned-up lower stem of the Jordan in return for its share of the Yarmuk. Managing all of the Yarmuk's flow, except for Syria's share, would be easier for Jordan than sharing the lower stem of the Jordan river with Israel. Moreover, such a scheme would be consistent with the principle of environmental and hydrological symmetry put forth above.]*

10) Settling for three-fifths of the flow of the Yarmuk. This is a kind of fall-back position in which Syria would retain a larger portion but Israel still

would relinquish its share in return for all of the lower Jordan. *[The same arguments and advantages that obtain in 9 above apply here.]*

11) A "mini" water peace pipeline (MPPL) from Turkey. Although this issue does not represent a direct negotiating point of contact in the same sense as items 1—10 above do, it is an important matter to both Jordan and Israel that will probably arise in some form during the negotiations, and one about which the Americans have expressed genuine interest. The MPPL has many of the advantages with few of the disadvantages of the full scale peace pipeline proposed by President Ozal which is intended to reach the Gulf states. *[Aside from technical and economic feasibility, the MPPL has several political advantages: The U.S. government is sufficiently interested to have allowed talks for cooperation to occur between President Ozal and General Hatch, the head of the U.S. Army Corps of Engineers; the Syrian cities that suffer chronic water shortages could also be served by the MPPL, thereby winning Syrian cooperation which would be needed because the path of the MPPL would run through Syria; the MPPL would differ from a Lebanese pipeline where Israel could prove to be an obstacle and where there would be greater uncertainty about a sustained supply of water; Turkey, on the other hand, does have surplus water, assuming its supplies are well managed, and Jordan plus Turkey, with presumed U.S. backing, would together be in a stronger position to ensure the integrity of the MPPL than could Jordan alone against either Syria or Israel; and, finally, the presence of additional water in Jordan would strengthen Jordan's role in regard to water supplies for meeting the needs of the West Bank Palestinians.]*

VI. The Legal Bases for Jordan's Riparian Position

The legal bases for Jordan's riparian position at the peace negotiations are set forth here in the text in summary form. Specific legal citations and case studies are compiled in Appendix I.

1) General principles: The context of law applicable to Jordan's position. The sources of international law, summarized in article 38 of the Statute of the International Court of Justice are:

a) conventions (treaties and other international conventions)

b) customary international law

c) general principles of law recognized by representative legal systems

2) Customary international law emerges from a process of claim and counterclaim between states that demonstrate:

a) consistent state practice

b) an *opinio juris* (the belief that the practice is required by law)

c) either or both factors are revealed through i) treaties or other agreed arrangements, including treaties to which the particular state is not a party, ii) votes in international assemblies, iii) decisions by courts or international arbitrators, and iv) unilateral actions of relevant states

3) Customary international law consists of either general or special customs:

a) general customs that purport to apply universally and bind all states except those that can show they have consistently resisted application of the custom

b) special customs that purport to operate only within a specific region and bind only those states that can be shown to have accepted the custom

4) Customary international law and general principles of law may be proven through resort to the opinions of "well qualified publicists" which thus serve as secondary evidence of international law, including:

a) texts by respected scholars

b) court and arbitral opinions

5) The basic legal principles appertaining to water issues that are encompassed by the general conventions may be summarized thus:

a) *customary international law.* Customary or equitable utilization states that each riparian is entitled to a reasonable and equitable portion in the beneficial use of the shared waters; equitable apportionment takes into consideration such factors as population, geography, alternative sources, etc. (Downstream users generally favor these rules.)

b) *absolute sovereignty* (or the Harmon Doctrine). This rule argues that a nation may do what it pleases with the water within its own borders and send it down in whatever

quantity and quality it chooses. (Dominant upper riparians favor this doctrine.)

c) *appreciable harm* (or Good Neighborliness). This is a principle of Roman law which argues that a nation use its resources in ways that do not do appreciable harm or injury to others who share those resources, based on the principle that a state is responsible for actions within its own borders that might harm the interests or property of another state; when this principle is applied, it is often difficult to determine the extent of responsibilities and is difficult to enforce.

d) *obligation to notify and inform.* This rule concerns the responsibility of a nation to inform others of activities that will affect them in order to allow the affected parties to negotiate mitigation or to protest or prevent the action (e.g., as when Turkey informed Syria and Iraq before cutting off the downstream flow of the Euphrates in order to start the process of filling the Ataturk Dam reservoir.) This principle is generally applied in practice.

6) The legal principles applicable to groundwater are identical to those applicable to surface water.

VII. International Conventions Possibly Applicable to Surface Water Sources in the Jordan Basin.

1) There is relatively little evidence in support of the applicability of any convention to the waters of the Jordan basin.

2) Only a weak argument supports a claim that the agreements between France and the United Kingdom during the mandate period were accepted on behalf of Israel by Ambassador Abba Eban in his statement to the Security Council of the UN in 1953. Those agreements go only a little beyond requiring a vague notion of equitable sharing.

3) Neither the Rutenberg Concession nor the Johnston Plan apply to the Kingdom of Jordan to any greater extent than the French-British mandate agreements apply to Israel.

4) The Johnston (or Unified) Plan possibly has become a rule of special custom among the states sharing the Jordan basin.

VIII. Customary International Law Applicable to the Surface Water Sources of the Jordan Basin

See Appendix I for legal sources and case citations of applicable laws.

IX. Possible Jordanian-Palestinian Negotiating Positions Derived from Legal Claims

1) Israel has no legal claims on the waters of the Litani or other rivers or sources in the region that do not abut or cross Israeli territory:

a) Legally and practically, Israel can use water from beyond its borders only through agreements with all states riparian to those waters.

b) Legally and practically, Israel can only transport such water (e.g., as through the proposed "Peace Pipeline") across national boundaries in accordance with agreements with states whose boundaries would have to be traversed.

2) Legally, Israel may not appropriate the water of the Jordan river and its tributaries without regard for the needs of the populations of Jordan, Lebanon, Syria, and the West Bank. Any Israeli use of water from surface sources is unlawful if it would produce appreciable harm to the interests of other states:

a) This principle is strongly supported by the International Law Commission (a UN body) as the primary rule relative to internationally shared water resources (International Law Commission, *Draft Articles on Non-Navigational Uses of International Water Systems*, A/CN .4/L.463/Add. 4, art. 7 (1991).

b) However, it should be noted that while this principle favors Jordan and its Palestinian associates relative to Israel, the same principle could be applied to restrict the development of some of their water resources. For example, the principle would be applicable to the development of the Yarmuk or the waters of the West Bank as regards Israel's interests.

3) In consideration of the needs of all the basin's riparian states, any Israeli use of water from surface sources is unlawful it if exceeds an equitable share of the water available from those sources (International Law

Commission, *Draft Articles on Non-Navigational Uses of International Water Systems*, A/CN .4/L.463/Add. 4, art. 5 (1991).

4) Under either the principle of appreciable harm or equitable sharing, the dumping of saline waters into the lower Jordan is unlawful as it renders those waters wholly unfit for any use, and thus precludes the lower riparians in Jordan and the West Bank from obtaining any share of the Jordan river's waters.

5) Jordan and its Palestinian associates need to consider carefully the ramifications of arguing for or against a claim that the Johnston Plan provides an agreed allocation scheme by means of a special customary rule of international law. Two major questions need to be answered:

a) Does such a claim provide a fair and realistic allocation of the waters of the Jordan, particularly in the present circumstances which are significantly different from those obtaining in 1955?

b) What effect would such a claim have on the uses of water drawn from the Yarmuk river?

6) Groundwater is a particularly sensitive issue because of Israel's control and exploitation of the shared aquifer water resources of the West Bank; these waters are regulated and used in ways that seriously impair the legal rights of the Palestinian population to an equitable share:

a) The Geneva Convention on the Treatment of Civilians, which is relevant in this matter, applies to the Israeli occupation of the West Bank and Gaza (UN General Assembly Resolution No. 3240 [XXX] B, 29 Nov, 1974 (adopted by a vote of 121–0).

b) While the Geneva Convention does not address the use of water per se, the Convention does provide in article 55 that:

> The Occupying State shall be regarded only as administrator and usufructory of public buildings, real estate, forests, and agricultural estates belonging to the hostile state, and situated in the occupied country. It must safeguard the capital of these properties, and administer them in accordance with the rule of usufruct.

7) Thus, by the terms of this article, Israel is entitled only to make such use of water as was made by the prior sovereign without impairing the capital

of the resource, at most an equitable share divided among those communities drawing from the common aquifer.

8) Moreover, as article 49 of the Geneva Convention provides: "The occupying power shall not deport or transfer parts of its own civilian population into the territory it occupies."

9) Since, under article 49, the Israeli settlements in the Occupied Territories are illegal, so the needs of those settlements cannot be considered in determining an equitable share of either the surface or groundwater sources available to the several communities.

X. What Incentives or Power Can Jordan Use to Persuade Israel to Accept a Change in the Status Quo?

1) Realistically, Jordan possesses few obvious incentives that are compelling or much power to exercise on the Israelis; therefore, whatever leverage exists must be developed and used to its full potential. In this connection, two factors need to be borne in mind:

a) Virtually all of the basin's waters are being utilized with little chance for significant increases in supply, nor, given the projected rate of population growth, is demand likely to decrease by much.

b) The circumstances that exist in the Jordan basin present the most difficult kind of problem—that of redistribution of a finite vital resource among hostile actors in a situation where one of the parties enjoys hegemonic power over the others.

2) Although Jordan's options are limited, there are nevertheless certain incentives and influences that can be brought to bear on the situation:

a) *international influence.* Israel may be resistant but not altogether unmovable by pressures from abroad, particularly the U.S. and the EC; Jordan must play an astute public relations game throughout the negotiations, and must particularly do all it can to win American support for its position.

b. *"Dead-Red" Canal cooperation.* Jordan could offer the incentive of cooperation on the proposed Dead-Red canal which is an increasingly attractive energy project for Israel (as it is for Jordan). Without Jordanian cooperation, the project would probably not receive the international funding it requires, nor could it achieve its full potential.

c. *water supply to the Occupied Territories.* Another incentive could be the useful role that Jordan could play in an arrangement for supplying water to the Territories, e.g., agreeing to a mini-pipeline from Turkey to Jordan (after securing the cooperation of Syria) and from Jordan to the Territories; this could provide the Palestinians with an increased supply and enable the Israelis to maintain their needs from the sources in the Territories. This just might introduce some movement on the issue of Israeli claims on West Bank water; however, it should not inspire an expectation that Israel would alter its claims by much and this approach could be seen by the Palestinians as weakening their claims.

d) *basin-wide agreement.* Jordanian cooperation is essential for any basin-wide arrangements desired by Israel or pushed by the Americans and Europeans. If Israel can be convinced that a sharing scheme on a basin or system-wide scale would benefit it the most (and, incidentally, be free of the stigma that aggressive unilateral seizures of water carry), then Jordan's cooperation is recognized as pivotal. Moreover, for a basin-wide scheme to be effective and permanent, it would require the creation of a basin authority with sufficient independence, power, expertise, and funds to make the idea work. Such an authority would have to be representative of the basin's riparians and because that would give Israel additional recognition it could also provide more incentive for Israel to cooperate in this matter.

e) *shared desalinated water from the Gulf.* Jordan could be a potential conduit or facilitator for Israel to share in the transfer of desalinated water from the Gulf region to the Jordan basin (assuming the Gulf oil states could be persuaded to use their excess cheap energy and financial resources to produce surplus desalinated water for export at affordable prices). Such an arrangement would have to await an acceptable political settlement between Israel, the Palestinians, and other Arab participants.

f) *a stable border.* If Jordan has a single compelling incentive to offer Israel, it is perhaps the existence of a moderate, pragmatic, stable regime on Israel's border. Jordan could make a case that it would clearly be in Israel's interests to cooperate at least to the extent of enabling Jordan to achieve some of its basic economic priorities to avoid a destabilizing domestic political crisis that could radically alter conditions in Jordan. Such a situation would constitute a threat to the stability of the entire basin, to the interests of all the basin's actors and to U.S. and European policies in the region.

XI. Negotiating Strategies

Jordan will need utmost flexibility in the negotiating process. The negotiating team will need to establish cleary the priorities of its agenda and

line them up with what is known about those of Israel and the other Arab actors with whom Jordan will be coordinating its eforts. Wherever a strategic discrepancy appears between the higher and lower priorities on the respective agendas, it will be there that movement will be most possible, and therefore it is at those points that stress should be placed in the negotiating process. In implementing this general strategy, the Jordanian team should seek timely junctures for injecting the aforementioned incentives for change in the status quo. For organizational and discussion purposes the hydro-political, hydrological, and economic strategy issues are separated, but are understood to be integral to one another.

Hydro-Political Issues. Given Jordan's position, and the necessity of emerging from these negotiations with assistance from its most urgent economic problems—indeed, winning such aid even in the course of the negotiating process—two core strategies are suggested in negotiating hydro-political issues:

1) *A "side-effect" approach.* It may actually be that the most significant goal of the negotiations is not the precise impact on Israel, but the positive impact on those nations that might help Jordan with its critical economic problems. Thus, Jordan would really be negotiating for "side effects" on the United States, Europe, and perhaps Japan. From this perspective, even failure in regard to outstanding issues with Israel is not incompatible with success overall, if that failure is not attributed by the side-effect targets, especially the U.S., to Jordanian intransigence; still better would be if the U.S. and others perceive Jordan as having done all in its power to produce success. Producing this latter impression should therefore be a cardinal goal. Thus, a primary tactical aim for Jordan would be avoidance of any external appearance of obstructiveness, making certain that the world is clearly and steadily informed of its key position and crucial economic needs, and generally being perceived as an essential good neighbor in this troubled region.

In fulfilling this task, it might be useful for the team to remind the international community that the unique importance of water for human life can lead either to severe conflict or solid cooperation. If the participants in a water rivalry can be made to see themselves as confronting a common fate, resolvable only through their cooperation, thus being responsible to and for one another, then a positive interaction very different from familiar hostility may occur, and that should be seen as the goal Jordan seeks to attain.

2) *A "stake-in-Jordan" approach.* This strategy is related to the "side - effect" proposal. Both Israel and the U.S. have a large strategic and political stake in the maintenance of a stable and moderate Jordan if the entire basin—and, by extension, the eastern littoral of the Mediterranean—is to avoid destabilization and possibly radicalization. This stake will be assured only if

Jordan is enabled without delay to solve its most outstanding socio-economic problems. This task cannot be accomplished unless Jordan's principal hydrological (and energy) needs are met, namely, the building of the Unity Dam and access to a fair and legal share of the Jordan River (i.e. a cleaned up lower stem). These essential goals cannot be achieved without Israeli cooperation and significant amounts of foreign aid. Therefore, it will not be sufficient simply to inform the international community of Jordan's pivotal position in the peace-seeking effort, but to clarify and press the point that the price of maintaining Jordan as a stable, moderate, good basin citizen is Israeli cooperation on hydro-political issues and American support for Jordan's position.

As a tactic integral to this strategy, seizing the initiative in putting forth a Jordanian plan for the creation of a basin-wide authority for regulating and apportioning the waters of the Jordan basin would strengthen Jordan's case. If a basin authority were actually achieved, it would greatly benefit Jordan, though, realistically, such an authority would require a political settlement among the users of the basin's waters, including the Palestinians who have a substantial legal claim to some of those waters. Nevertheless, if for no other reason than to implement the "side effect" strategy, Jordan would be wise to make such a demarche an overt proposal for using water as an opportunity to create experiences of cooperation and trust between former enemies.

Hydrological Issues. It is presumed, for the sake of this discussion, that Jordan has worked up a water budget (or balance) for the whole basin (the data supplied in the appendices should make this task easier if it needs to be done) and that projections for supply, demand, use, and population- -by country—have been made. In attempting a hydrological strategy, the Jordanian team should bear in mind the eleven hydrological factors together with the negotiating assessment of each that have been cited above (under Hydrological Issues to be Considered in the Negotiations, p.8).

1) *equitable sharing solution.* It is possible for Jordan to formulate a hydrological strategy on the basis of an "equitable" sharing solution (recalling here that "equitable" does not mean "equal"). This might be done by attempting to revive the Johnston (or Unified) Plan of 1955 which was negotiated by the U.S. and was almost successful. It could be presumed that for this reason, the U.S. would look sympathetically on the revival of that plan in some form. However, Jordan should embark on such a strategy with great caution. An equitable solution is not always a desirable one for both parties. Equitable solutions are open to considerable interpretation of what is "fair, right, and equitable," and in certain respects an equitable line of argument would not serve Jordan's needs, especially given Israel's

predominant power and advantageous upper riparian position since 1967, and its claims on the Yarmuk.

In part for this same reason, reviving the Johnston Plan could redound to Jordan's disadvantage. Several new factors must be taken into account,. e.g., the revised situation in the basin, particularly the power relationships among the riparians and their respective conditions, which have changed drastically in the intervening years, not to mention the altered circumstances of the region as a whole in the wake of the Gulf War. Israel would likely be the principal beneficiary on the basis of "equitable" apportionment, allowing for its riparian position, population, use, development, and need. However, the shoal on which the original Johnston Plan foundered, that of compliance observability, would be less an obstacle now owing to the availability of accurate remote sensing by satellite.

A tactic that the Israelis intend to use as part of their hydrological strategy can be offered as evidence that this approach should be attempted only with utmost care and planning. The Israelis will argue that Jordan, in tacitly observing the technical aspects of the otherwise failed Johnston Plan, had, as part of its overall water plan, made a policy decision in May of 1967 to transfer water from the Yarmuk River to the West Bank, then under Jordanian control, for irrigation and other purposes (the Israelis may even claim that this policy dates back to the 1950s). Therefore, the Israelis will argue, the Palestinians have a claim on the waters of the Yarmuk to meet their needs, that they should insist on Jordan fulfilling its original intention and supply them with Yarmuk water, that in fact Jordan has an obligation to do so under the Johnston Plan on the principle of equitable sharing. Israel's motives for such a tactic are obvious. It would hope to shift the issue of Palestinian rights to basin waters away from demands on Israel to demands on Jordan, thereby presumably relieving itself of pressure from the Palestinians and other s for the waters of West Bank. Whether this is a legal or fair argument will not deter the Israelis from raising it and the Jordanian-Palestinian team should be ready.

2) *basin symmetry*. This strategy considers the Jordan basin and its environs from the point of view of an environmental—i.e., hydrological—whole. While there is in this region a west to east environmental transition as regards precipitation and water availability, in the Jordan basin on both sides of the river there is a significant diminution of water availability from north to south. Both countries have better precipitation in the north and desert conditions in the south; that is, there is a hydrological symmetry in the basin that runs along a north-south axis. When a map is folded along the river basin, a hydrological and climatic mirror image may be observed along either side of the fold line. That symmetry is violated when there is an

imbalance in the apportionment and use of the basin's water, as presently exists to a serious degree between Israel and Jordan.

That asymmetry upsets the environmental balance of the basin. In terms of an environmental and hydrological balance, a sustainable Israel depends on a sustainable Jordan. Without Jordan, Israel would be like a four-legged chair with only the rear (western) legs. In short, Israel needs to maintain symmetry with Jordan—together the two nations (including the Palestinians of the Occupied Territories) constitute a single environmental whole. If the environmental/hydrological balance is not restored, the political asymmetry between Jordan and Israel will worsen and the consequences will translate quickly into political conditions dangerous to Israel, Jordan, and other basin actors alike, and will dash American hopes of creating a line of stable, non-confrontational states along Israel's Jordan basin borders. A weakened, water famished Jordan would be a formula for disaster in the basin that can be avoided principally by Israeli-Jordanian cooperation in establishing a new pragmatic hydrological balance in the basin centered on Jordan, Israel, and the Occupied Territories, because 80% of the basin lies within Jordan, Israel, and the West Bank, and it is these populations that depend most upon its waters.

Economic and Other Issues. Given that Jordan's most critical and immediate needs are economic, and that water is a key to alleviating the crisis, Jordan must be prepared, at an appropriate juncture, to make some bold water-related economic proposals in the negotiating process.

1) *economic restructuring*. One of the most fruitful ways to alleviate the basin's problems of water scarcity and overpopulation is through the restructuring of economies away from heavily irrigated agriculture toward other sectors such as service, electronics, and light industry. This is a difficult but not impossible task given proper incentives and strictly dedicated foreign assistance.

Experts have for some time argued that Middle Eastern governments should realize that their energy and water resources would serve them better if they were exchanged, through an appropriate situation, for foodstuffs produced with far lower energy and water expenditures in locales with climates better suited to agriculture. This shift would enable water authorities to transfer enormous amounts of water from agriculture to far less consumptive industrial application which would simultaneously increase GNP. The contribution of light industry to GNP is about 30 times greater per unit of water used than the contribution of agriculture. In the Jordan basin, a reduction of irrigated agriculture by 40% (on both sides of the river), combined with a sustainable population growth, greater efficiency and

conservation, would enable Jordan and Israel to balance supply and demand—just about.

Jordan could take a bold initiative—one that would be attractive to the U.S. and other potential funders, e.g., the E.C. and World Bank—and propose such an economic restructuring in self-contained phases as a cooperative measure to strike a new hydrological balance. This undertaking would lend itself to collective support, so that those parties who would have to make available the funds essential to easing the transition from agriculture to light industry could act jointly, spreading the risk.

By making such a proposal, Jordan could place itself in the forefront (and be seen thus) of trying to establish a new economic basis for peace and stability in the basin. It could go one step farther by proposing itself as a demonstration model for the scheme, not only for the Middle East, but for other parts of the world as well. Its candidacy for the role is already strong because of its pressing economic and water-related problems and by its perceived willingness to be innovative.

2) *a community of experts.* In the Jordan basin, as in the Middle East as a whole, international fresh water use, allocation, and preservation suffer from a lack of inter-and-intrabasin cooperation, poor data, and uncoordinated, piecemeal approaches that result in fragmented policies and action. Since it is unlikely that cooperation can be coerced or induced at the highest political levels, another approach must be found. The most promising is to encourage cooperation—at a lower but still significant level—among officials and technical experts. If officials and scientists in the region communicate sufficiently to develop shared understanding of the water situation, available technologies, and potential solutions, they could become a strong force for cooperation—a community of informed officials and experts among all the basin's actors, indeed, throughout the region, to press for and guide effective water policies.

Jordan could initiate such a proposal at the talks as a confidence-building measure, one that would not be difficult to implement in stages, that would be attractive to world opinion (including Israelis), and that could be used as a building block for other such actions and could include such other Arab riparians as choose to join in.

3) *technological infrastructure.* The key to achieving these goals—and in some respects the key to successful economic restructuring—would be the establishment of a technological infrastructure for hydropolicy that addresses problems at two levels: basin and regional. Specifically, this would involve the establishment of two interrelated institutes: 1) a basin institute and 2) a comprehensive Middle East regional water institute. The latter would have

to await a full comprehensive political settlement between all the Arab parties and Israel, but the basin institute could be made a goal of the Jordanian-Palestinian -Israeli talks. The institute, comprising staff, fellows, trainees, and perhaps personnel from other basins in the region, would perform several functions: a) provide expertise, research, educational opportunities, and data necessary to develop the entrepreneurial, human, and technical resources presently lacking; b) generate databases and hydrological, economic, and other social scientific analytical tools; c) act as a conference setting; d) serve as a center for accurate record keeping and information dissemination; e) foster interaction among basin and even regional specialists.

By proposing this idea at an appropriate point in the negotiations, Jordan would initiate yet another confidence-creating measure that would win the support of the U.S., the Europeans, and such international agencies as the World Bank and which would allow other basin actors to join in as they saw fit.

These actions could be launched even without formal agreements in place (though some tacit willingness would be necessary), and in the absence of full trust among the parties; most of them can be implemented in stages, testing the success of each phase before going on to the next. By taking bold but pragmatic initiatives such as these (and others put forth under previous headings), Jordan would be availing itself of virtually the only means it has of taking a proactive role in the negotiations and of carrying out a "side-effects" strategy. Otherwise, owing to the disparity of power, riparian advantage, and negotiating resources that are possessed by Israel, Jordan would find itself in a predominantly reactive posture—and thus at a disadvantage—throughout the talks. In these circumstances, perhaps the greatest risk would be to take no risks at all.

APPENDIX I

CUSTOMARY INTERNATIONAL LAW APPLICABLE TO SURFACE WATER SOURCES IN THE JORDAN BASIN (INCLUDING LEGAL SOURCES AND CASE CITATIONS)

AND

CONSENSUS EVIDENCE OF CUSTOMARY INTERNATIONAL LAW: EXPERT OPINIONS OF INTERNATIONAL ORGANIZATIONS

Appendix I

Customary International Law Applicable to Surface Water Sources in the Jordan Basin (including legal sources and case citations)

A. In the absence of an agreement by all interested states, only riparian states have any claim to share in the waters of an international river system:

1) International Law Association, *The Helsinki Rules on the Uses of the Waters of International Rivers* , art. III (Report of the 52nd Conference, adopted at Helsinki, August 20, 1966).

2) International Law Commission, *Draft Articles on Non-Navigational Uses of International Water Systems* , A/CN.4/L.463/Add.4, arts. 4 and 5 (1991).

B. States embrace one of four claimed general customary rules relative to shared water resources:

1) An upper riparian state will initially claim "absolute territorial sovereignty"; this means:

a) Claiming the right to do whatever it chooses with the water regardless of the effect of the activity on other riparian states.

b) See, e,g,, the *Harmon Doctrine*, 21 Op. Attorney General, 274, 282-282 (1989)

2) Lower riparian states begin with a claim to the "absolute integrity" of the watercourse; this means:

a) Claiming that an upper riparian state can do nothing that affects the quantity or quality of water that flows down to the lower riparian states.

b) See, e.g., the Spanish claim in the Lake Lanoux Arbitration (France v. Spain), 24 *International Law Review*, 101 (1957), summarized in 53 *American Journal of International Law*, 156 (1959).

3) Eventually the competing riparian states reach a *modus vivendi* based on a theory of "restricted sovereignty," meaning that:

a) Each riparian state recognizes the right of all riparian states to use water from a single shared source and the obligation to manage that use so as not to interfere unreasonably with the uses of or in other riparian states.

b) The quantity of water to which each state is entitled might be defined according to some more or less objective measure of need such as historic patterns of use, population, area, arable land, or the vague notion that each state is entitled to a "equitable share" of the water.

c) Support for the equitable utilization rule is overwhelming in the practice of states, as viz:

i. The *Harmon Doctrine* has been repudiated even by the U.S. government: *Memorandum to the Legal Advisor,* November 23, 1942, in 3 Marjorie Whiteman, *Digest of International Law,* 950-954 (1964).

ii. Nearly 100 treaties embracing the equitable utilization principle were in force by 1950 and more have followed since then. These treaties are listed in the following sources:

a. Friedrich Berber, *Rivers in International Law,* (R.K. Bastone, trans.,), 127-37.

b. U.N., *Report of the U.N. Commission for Europe. Legal Aspects of Hydro-Electric Development of Rivers and Lakes of Common Interest,* 95-152 U.N. Doc. E/ECE/136 91952).

c. Herbert Smith, *The Economic Uses of International Rivers,* (1931).

d. Albert Utton, *International Streams and Lakes* , 2, *Waters and Water Rights* , art. 49.03 (a) (Robert Beck, ed.) 1991.

iii. International judicial and arbitral awards also predominantly favor equal utilization, as viz:

a. *The Case of the Territorial Jurisdiction on the International Commission of the Oder River*, (1929), P.C.I.J., ser. A, No. 23 at 27.

b. *The Lake Lanoux Arbitration (France v. Spain)*, 24 I.L.R. 101, 139 (1957), summarized in 53 *American Journal of International Law*, 156, 170 (1959).

iv. The respected publicists who have written on the question are in virtual unanimous agreement on same point; see, e.g.:

a. International Law Association, *The Helsinki Rules on the Uses of the Waters of International Rivers*, Report of the 52nd Conference adopted at Helsinki, August 20, 1966.

b. Friedrich Berber, *Rivers in International Law*, 25, 272-74 (R.K. Bastone, trans.), 1959.

c. Daniel O'Connell, *International Law*, 556-558 (2nd edition 1970).

d. Lassa Oppenheim, *International Law*, 474-75 (8th edition, Hersch Lauterpacht , ed.) 1959.

e. Herbert Smith, *The Economic Uses of International Rivers*, 150-51 (1931).

f. Ludwik Teclaff, *The River Basin in History and Law*, 152 (1967).

g. Dominique Alheritiere, *Settlement of Public International Disputes on Shared Resources: Elements of a Comparative Study of International Instruments*, in *Transboundary Resources Law*, 139-49 (Albert Utton & Ludwik Teclaff, eds. 1987).

h. Juraj Andrassy, *L'Utilization des Eaux des Bassins Fluviaux International*, 16 *Revue Egyptienne de Droit International*, 23 (1960).

i. Dante Caponera, *Patterns of Cooperation in International Water Law*, in *Transboundary Resources Law*, op. cit. at 1, 3-10.

j. Aziza Fahmi, *International River Law for Non-Navigational Rivers with Special Reference to the Nile*, 23 *Revue Egyptienne de Droit International*, 39 (1967).

k. Gretta Goldenman, *Adapting to Climate Change: A Study of International Rivers and Their Legal Arrangements*, 17 *Ecology Law Quarterly*, 741 (1990).

l. Albert Utton, *International Streams and Lakes*, 2 *Waters and Water Rights*, art 49.03(e) (Robert Beck, ed.) 1991.

4) By international agreements relating to shared water resources, some states have gone further and embraced a "community of property" in the watercourse. This usually occurs when the waterbasin is jointly developed and managed as a unit without regard to international borders or when it is coupled with an agreed sharing of the benefits of that development and management. The concept of an international drainage basin as a basic unit of resource management is widely supported by naturalists, engineers, and economists as well as jurists. This notion is perhaps best developed in Ludwik Teclaff *The River Basin in History and Law*, (1967). Such an approach is ultimately the only means of avoiding the law of the vendetta in the inevitable conflicts that arise from disputes over the vague norm of "equitable utilization" even when linked to an obligation to consult or notify other riparian states of proposed activities.

C. The *The Draft Articles of the International Law Commission* also posit what some experts see as a fifth possible rule of international water usage that says that a state cannot make use of an international watercourse if it would cause "appreciable injury" to other states sharing the resource. International Law Commission, *Draft Articles on Non-Navigational Use of International Watercourses*, art. 7, A/CN.4/L.463/Add.4 (1991). Some specialists, such as Stephen McCaffrey, Special Rapporteur for the Draft Articles, (see *The Law of International Watercourses: Some Recent Developments and Unanswered Questions*, 17 *Den. Journal of International Law and Policy* 505, 509-10 (1989) would interpret the "no appreciable harm" rule as barring any actions which would injure to

almost any degree another interested state. Such interpretations make the principle in effect a variant expression of the claim to the absolute integrity of the watercourse. Another reading of the "no appreciable injury" rule is that it is a variant reading of the "equitable utilization" rule focused on the problem of pollution rather than allocation (see, e.g., The Danauversinkung Case (Wurtemberg v. Baden), *Annual Digest and Report of Public International Law Cases*, 128 (Rgst. 1927), and Albert Utton, *International Streams and Lakes*, 2 *Waters and Water Rights*, art. 49,03(a) (Robert Beck, ed. 1991). Whatever it means, the "no appreciable injury" rule is supported as an expression of the rule of "good neighborliness."

D. The legal principles applicable to groundwater are identical to those applicable to surface water as demonstrated by the opinions of well qualified publicists, e.g.:

1) International Law Association, *International Rules on Groundwater, Report of the Sixty-Second Conference*, 21, 231-85 (Seoul 1986).

2) Julio Barberis, *The Development of International Law of Transboundry Groundwater*, 31 *Natural Resources Journal*, 167 (1991).

3) Julio Barberis, *Le regime juridique international de eauz souterraines*, 33 *Annuaire Francais do Droit International*, 130 (1978).

4) Robert Hayton and Albert Utton, *Transboundry Groundwaters: The Bellagio Draft Treaty*, 29 *Natural Resources Jouranal*, 663 (1989).

5) Albert Utton, *International Groundwater Management: The Case of the U.S.-Mexican Frontier*, 57 *Nebraska Law Review*, 663 (1978).

Consensus Evidence of Customary International Law: Expert Opinions of Representative International Organizations

A. Expert Opinions of International Bodies (consensus evidence of customary international law)

1) International Law Institute, *Declaration of Madrid*, 24 *Annuaire do l'Institut do Droit International*, 367 (1911):

a. Para. I: "When a stream forms the frontier of two states,...neither state may, on its own territory, utilize or allow the utilization of the water in such a way as to seriously interfere with its utilization by the other State or by individuals, corporations, etc., thereof."

b. Para. II: "When a stream traverses successively the territories of two or more states...no establishment...may take so much water that the constitution , otherwise called the utilizable or essential character of the stream shall, when it reaches the territory downstream , be seriously modified."

2) International Law Association, *Report of the 47th Conference* 242 (Dubrovnik 1956):

"So far as possible, riparian states should join with each other to make full utilization of the waters of a river, both from the viewpoint of the river basin as an integrated whole, and from the viewpoint of the widest variety of uses of the water, so as to assure the greatest benefit to all."

3) Inter-American Bar Association, *Principles of Law Governing the Uses of International Rivers and Lakes* (1957):

"States having under their jurisdiction part of a system of international waters are under a duty to refrain from making changes in the existing regime that might affect adversely the advantageous use by one or more other states having a part of the system under their jurisdiction except in accordance with: (1) an agreement with the state or states affected or (ii) a decision of an international court or arbitral commission."

4) International Law Association, *Report of the 48th Conference* 99–100 (New York 1958):

a. Agreed principle 1: "A system of rivers and lakes in a drainage basin should be treated as an integrated whole, and not piecemeal."

b. Agreed principle 2: "[E]ach coriparian states is entitled to a reasonable and equitable share in the beneficial uses of the waters of the drainage basin. What amounts to a reasonable

and equitable share is a question to be determined in the light of all the relevant factors in each particular care."

5) International Law Institute, *Resolution on the Use of International Non-Maritime Waters*, 49 Annuaire de l'Institut de Droit International II 381–84, art. 2 (Salzburg, 1961):

"Every state has the right to utilize waters which traverse or border its territory, subject to the limitations of international law....The right is limited by the right of utilization of other states interested in the same watercourse or hydrographic basin."

6) International Law Association, *Report of the 52nd Conference* 14–20, 484–532 (Helsinki 1967) ("The Helsinki Rules")

a. article I: "The general rules of international law as set forth in these chapters are applicable to the use of the water of an international drainage basin except as may be provided otherwise by convention, agreement or binding custom among the basin states."

b. article III: "A 'basin State' is a state the territory of which includes a portion of an international drainage basin."

c. article IV: "Each basin State is entitled, within its territory, to a reasonable and equitable share in the beneficial use of the water of a international drainage basin."

d. article V: "(1) What is a reasonable and equitable share within the meaning of Article IV is to be determined in the light of all the relevant factors in each particular case.
(2) Relevant factors which are to be considered include, but are not limited to:
(a) the geography of the basin, including in particular the extent of the drainage area in the territory of each basin State;
(b) the hydrology of the basin, including in particular the contribution of water by each basin State:
(c) the climate affecting the basin;
(d) the past utilization of the waters of the basin, including in particular existing utilization;
(e) the economic and social needs of each basin State;
(f) the population dependent on the waters of the basin in each basin State;

(g) the comparative costs of alternative means of satisfying the economic and social needs of each basin State;
(h) the availability of other resources;
(i) the avoidance of unnecessary waste in the utilization of waters of the basin;
(j) the practicability of compensation to one or more of the co-basin States as a means of adjusting conflicts among uses; and
(k) the degree to which the needs of a basin State may be satisfied, without causing substantial injury to a co-basin State.

(3) The weight to be given to each factor is to be determined by its importance in comparison with that of other relevant factors. In determining what is a reasonable and equitable share, all relevant factors are to be considered together and a conclusion reached on the basis of the whole."

g. article VI: "A use or category of use is not entitled to any inherent preference over any other use or category of uses."

h. article IX: "As used in this Chapter, the term 'water pollution' refers to any detrimental change resulting from human conduct in the natural composition, content, or quality of the water of an international drainage basin.

i. article X: "(1) Consistent with the principle of equitable utilization of the waters of an international drainage basin, a State:
   (a) must prevent any new form of water pollution or any increase in the degree of existing water pollution in an international drainage basin which would cause substantial injury in the territory of a co-basin State, and
   (b) should take all reasonable measures to abate existing water pollution in an international drainage basin to such an extent that no substantial damage is caused in the territory of a co-basin State.

   (2) The rule stated in paragraph 1 of this Article applies to water pollution originating
   (a) within the territory of the State, and
   (b) outside the territory of the State, if it is caused by the State's conduct."

7. U.N. General Assembly, *Report of the United Nations Conference on the Human Environment at Stockholm, Sweden* , U.N. Doc. A/Conf. 48/14 ("the Stockholm Declaration"), principle 21 (1972):

> "States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their own jurisdiction or control do not cause damage to the environment of other states or of areas beyond the limit of national jurisdiction."

8. U.N. General Assembly, *Report of the United Nations Water Conference, Mar del Plata, Argentina* , U.N. Pub. E. 77 II. A. 12 (1977), at 53:

> "It is necessary for States to cooperate in the case of shared water resources in recognition of the growing economic, environmental and physical interdependencies across international frontiers. Such cooperation . . . must be exercised on the basis of the equality, sovereignty and territorial integrity of all States."

9. International Law Commission, *Draft Articles on Non-Navigational Uses of International Water Systems*, A/CN.4/L.463/Add.4 (1991):

   a. article 5: "(1) Watercourse States shall in their respective territories utilize an international watercourse in an equitable and reasonable manner. In particular, an international watercourse shall be used and developed by watercourse States with a view to attaining optimal utilization thereof and benefits therefrom consistent with adequate protection in the watercourse.
   (2) Watercourse States shall participate in the use, development and protection of an international watercourse in an equitable and reasonable manner. Such participation includes both the right to utilize the watercourse and the duty to cooperate in the protection and development thereof, as provided in the present articles."

   b. article 6: "(1) Utilization of an international watercourse in an equitable and reasonable manner within the meaning of article 5 requires taking into account all relevant factors and circumstances, including:

(a) geographic, hydrographic, hydrological, climatic, ecological and other factors of a natural character;
(b) the social and economic needs of the watercourse States concerned;
(c) the effects of the use or uses of the watercourse in one watercourse State on other watercourse States;
(d) existing and potential uses of the watercourse;
(e) conservation, protection, development and economy of use of the water resources of the watercourse and the costs of measures taken to that effect;
(f) the availability of alternatives, or corresponding value, to a particular planned or existing use.

(2) In the application of article 5 or paragraph 1 of this article, watercourse States concerned shall, when the need arises, enter into consultations in a spirit of cooperation."

c. article 7: "Watercourse States shall utilize an international watercourse in such a way as not to cause appreciable harm to other watercourse States."

d. article 8: "Watercourse States shall cooperate on the basis of sovereign equality, territorial integrity and mutual benefit in order to attain optimal utilization and adequate protection of an international watercourse."

e. article 10: "(1) In the absence of agreement or custom to the contrary, no use of an international watercourse enjoys inherent priority over other uses.
(2) In the event of a conflict between uses of an international watercourse, it shall be resolved with reference to the principles and factors set out in articles 5 to 7, with special regard being given to the requirements of vital human needs."

f. article 20: "Watercourse States shall, individually or jointly, protect and preserve the ecosystems of international watercourses."

g. article 21: "(1) For the purposes of this article, 'pollution of an international watercourse' means any detrimental alteration in the composition or quality of the waters of an international watercourse which results directly or indirectly from human conduct.
(2) Watercourse States shall, individually or jointly, prevent, reduce and control pollution of an international watercourse

that may cause appreciable harm to other watercourse States or their environment, including harm to human health or safety, to the use of the waters for any beneficial purpose or to the living resources of the watercourse. Watercourse States shall take steps to harmonize their policies in this connection.

(3) Watercourse States shall, at the request of any of them, consult with a view to establishing lists of substances, the introduction of which into the waters of an international watercourse is to be prohibited, limited, investigated or monitored."

h. article 24: "Watercourse States shall, individually or jointly, take all appropriate measures to prevent or mitigate conditions that may be harmful to other watercourse States, whether resulting from natural causes or human conduct, such as flood or ice conditions, water-borne diseases, siltation, erosion, salt-water intrusion, drought or desertification."

i. other articles describe the obligation to cooperation in greater detail, including a duty to inform and consult with other affected states, but leave the states to the traditional process of negotiations (claim and counterclaim) to resolve their differences.

B. Judicial or Arbitral Opinions (evidence of customary international law or general principles of law)

1. *Kansas v. Colorado*, 185 U.S. 125, 146 (1902):

"Sitting, as it were, as an international, as well as a domestic tribunal, we apply Federal law, state law, and international law, as the exigencies of the particular case demand."

2. *Wyoming v. Colorado*, 259 U.S. 419, 466 (1922):

"The contention of Colorado that she as a State rightfully may divert and use, as she may choose, the waters flowing within her boundaries in this interstate stream, regardless of any prejudice that this may work to others having rights in the stream below her boundary, can not be maintained. The river throughout its course in both States is but a single stream wherein each State has an interest which should be respected by the other."

3. *Danauversinkung Case (Wurttemberg v. Baden)*, Ann. Digest & Rep. of Pub. Int'l L. Cases 128 (Rgst. 1927):

   "The exercise of sovereign rights by every State in regard to international rivers traversing its territory is limited by the duty not to injure the interest of other members of the international community. Due consideration must be given to one another by States through whose territories there flows an international river. No state may substantially impair the natural use of the flow of such river by its neighbor . . . . Application of this principle is governed by the circumstances of each particular case. The interests of the States in question must be weighed in an equitable manner against one another. One must consider not only the absolute injury caused to the neighboring State, but also the relation of the advantage gained by one to the injury cause to the other."

4. *New Jersey v. New York*, 283 U.S. 336, 342-43 (1931):

   "[Water] offers a necessity of life that must be rationed among those who have power over it. New York has the physical power to cut off all the water within its jurisdiction. But clearly the exercise of such a power to the destruction of the interest of lower States could not be tolerated. And on the other hand equally little could New Jersey be permitted to require New York to give up its power altogether in order that the River might come down to it undiminished. Both States have real and substantial interest in the River that must be reconciled as best they may be."

5. *The Trail Smelter Case (United States v. Canada)*, 35 Am. J. Int'l L. 684, 716 (1941) (an air pollution case):

   "[U]nder the principles of international law . . . no State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties therein, when the case is of serious consequence and the injury is established by clear and convincing evidence."

6. *The Indus River Basin Case (the Sind v. the Punjab)*, Report of the Indus (Rao) Commission 10-11 (1942):

   "The most satisfactory settlement of disputes of this kind is by agreement, the parties adopting the same technical solution of each problem, as if they were a single unified community undivided by political or administrative frontiers . . . . If there is no . . . agreement, the rights of the several Provinces and States must be determined by

applying the rule of 'equitable apportionment,' each unit getting a fair share of the water of the common river."

7. *The Zarumilla River Arbitration (Ecuador v. Brazil)*, Informe de las Relaciones Exteriores a la Nacion 623 (Quito 1946), translated in Griffin, "The Use of Waters of International Drainage Basins under Customary International Law," 53 Am. J. Int'l L. 156 (1959):

   "[The two states have] co-dominion over the waters in accordance with international practice."

8. *The Lake Lanoux Arbitration (France v. Spain)*, 24 I.L.R. 101 (1957), digested in 53 Am. J. Int'l L. 156 (1959):

   Lake Lanoux is a small lake, located entirely in France; from Lake Lanoux, a small river flows into the Carol River, which flows into Spain. The French government proposed to divert the waters of the Carol River over a precipitous 780-meter drop into the Ariege River to generate electricity. Originally, France claimed the right of absolute sovereignty as its basis for doing so. When Spain complained that this project could not be undertaken without its consent, the French eventually promised to divert water (equivalent in volume and quality) downstream from the project from the Ariege to replenish the Carol River before it entered Spain. France and Spain agreed to arbitration to determine whether the proposed action would violate Spanish rights. Because of the plan to restore the Carol River as to both the quantity and the quality of its waters before the river entered Spain, the arbitration panel held that the planned works would not violate either customary international law or Spanish rights under the Treaty of Bayonne, signed, May 29, 1866, 56 Brit. & For. State Papers 212, by which the two nations had agreed to coordinate hydroelectric development of their shared waters. In reaching this conclusion, the tribunal, 101 I.L.R. at 139, 53 *Am. J. Int'l L.* at 170, stated:

   ". . . [A]ccording to the rules of good faith, the upstream State is under the obligation to take into consideration the various interests involved, to seek to give them every satisfaction compatible with the pursuit of its own interests, and to show that in this regard it is genuinely concerned to reconcile the interests of the other riparian State with its own."

9. *The Fisheries Jurisdiction Case (United Kingdom v. Iceland)*, I.C.J. 3, 33 (1974) (principles for sharing a fishery resource in the high seas):

"The task before [the States party to the dispute] will be conduct their negotiations on the basis that each must in good faith pay reasonable regard to the legal rights of the other in the waters around Iceland outside the 12-mile limit, thus bringing about an equitable apportionment of the fishing resources based on the facts of the particular situation, and having regard to the interests of other States which have established fishing rights in the area. It is not a matter of finding simply an equitable solution, but an equitable solution derived from the applicable law. As the Court state in the *North Sea Continental Shelf* cases:

'. . . it is not a question of applying equity simply as a matter of abstract justice, but of applying a rule of law which itself requires the application of equitable principles.'"

APPENDIX II

SELECTED HYDROLOGICAL DATA

Total Supply
(in Mcm/yr)

	Israel	Occupied Territories
Average supply, 1989–91 (non-drought conditions)	1950	650–700
Average supply (current drought conditions)	1600	450–550
Average total demand, 1987–91	2100–2200*	650–700
Average deficits, 1987–91 (non-drought conditions)	180–200	110
Average deficits (current drought conditions)	220	100
Projected demand, 2015–2020	2500–2800	**

* Includes settlements in Occupied Territories and Golan Heights
** Future status indeterminate

Water Consumption in Israel and West Bank, 1989–90

(in Mcm/yr)

	Israel	West Bank
Total urban consumption	500	25
Total agricultural consumption	1300	100
Domestic fresh water supply	1800	120
Deficit under 1989-90 practices	1000	350
Deficit under water use reform	500	300

Lake Tiberias
(in Mcm/yr)

Inflow from Jordan River	500–510
Diversion before entering*	100–110
Storage volume	4000
Utilization	420–70
Evaporation	178–270
Salinity	*250–400 (ppm)*
Pumped into NWC**	390
Outflow	40–70
Average level, 1990–91	*212.2m*
Current level, Nov '91	*211.89m*

* For local irrigation in Huleh Valley
** National Water Carrier

Water Allocation by Sector, 1960–1989
(in Mcm/yr)

	1960	1988–89
Domestic	200	450–500
Per capita consumption		*110 m^3*
Total consumption		450–500
Industrial	40	110
Irrigation	1060	1300

Water Allocation by Sector, 1991*
(in Mcm/yr)

	1991
Agriculture	870
Domestic/Industrial	600
Per capita consumption	*75–100 m^3*
TOTAL	1470**

* These data were provided by the new Water Commissioner, Professor Dan Zaslowsky, in a personal interview Aug 23, 1991

** Of the total, only 850–60 Mcm is fresh water; the remainder being brackish or return flow

Groundwater Usage*
(Mcm/yr)

	Yarkon-Taninim**		Coastal Aquifer***	
	Operational Reserve	Withdrawal	Operational Reserve	Withdrawal
1986–87	+300	-30	+500	-600
1987–88	+300	-30	+500	-635
1988–89	+300	130	+500	-700
1989–90	+300	40	+500	-814
1990–91	+300	-70	+500	-875

* Based on 1991 report by Comptroller-General

** Comptroller-General's report states that the draw-down has been stablized at 1.2 meters above the red line. Other sources considered by this author to be more accurate indicate that the draw-down has reached 60 centimeters above the red line. The Coastal Plain aquifer has not been replenished at the normal rate from Lake Tiberias for the past two years.

*** The annual saline water encroachment from the Mediterranean coast is 20–60 meters. The saline line has now reached 1.5 kilometers inland.

Water Usage by Sector, 1989*
(Mcm/yr)

Use	Quantity	%
Agriculture	1309	68.5
Domestic	495	25.9
Industrial	107	5.6

* Based on 1991 report by Comptroller-General

Water Allocation by Water Quality, 1984–2000
(in Mcm/yr)

	1984–85			
	Fresh	*Brackish*	*Reclaimed/Flood*	*TOTAL*
Domestic	420	—	—	420
Industry	80	30	—	110
Agriculture	1200	115	95	1410
Adjoining areas	110	—	—	120
TOTAL	1810	145	95	2050
	Projected for 2000			
	Fresh	*Brackish*	*Recliamed/Flood*	*TOTAL*
Domestic	640	—	—	640
Industry	90	40	5	135
Agriculture	740	120	320	1180
Adjoining areas	135	—	—	135
TOTAL	1605	160	325	2090

Groundwater Supply, Hydrological Year 1989-1991 (Oct 1–Sept 30)

(in Mcm/yr)

Coastal Aquifer		
Safe yield (average)		283
Average annual production		317
Deficit		34
Salinity (1990)		*155 mg/l*
Salinity projection (1992)		*250 mg/l for 16 wells**
Eastern Galilee Region		
	Western Galilee Coast /Haifa Basin	20 (potential)
	Eastern Zevulun Valley	10
	Western Yizre'el	10
Carmel Basin		
	Carmel Mountain Group	39 (8 brackish)
	Ephraim Mountain	22
	Western Carmel Coast	7 (brackish)
Eastern Basin		
	Gilboa-Bet She'an	130–140**
Yarkon-Taninim Aquifer		
Safe yield (average)		330
Brackish		40
Mean annual net pumping***		379
Deficit		49
Yarkon		100
Taninim Spring		230
Drought Conditions		
	Yarkon	80–85
	Taninim	200
Coastal Basin in Gaza		
Safe yield (average)		65
Current pumping		90
Salinity		*155 mg/l*

* This salinity level will make these wells unusable

** Includes 70–80 Mcm/yr from Gilboa and 10 Mcm/yr from Bet She'an

*** Water table of Yarkon-Taninim aquifer falling by 0.3–0.4 m/yr; Northeastern water table falling by approximately 2 m/yr

Mean per Capita Consumption by Sector, 1989–90

Urban		
	Large municipalities	85 m^3/yr
	Small municipalities	90 m^3/yr
	Low income municipalities	35 m^3/yr
	Large cities:	
	Tel Aviv	117 m^3/yr
	Haifa	
	Jerusalem	89 m^3/yr
		67 m^3/yr
Rural		
	Annual domestic supply	423 Mcm/yr
	Total sector consumption	89 Mcm/yr
	Per capita consumption	196 m^3/yr
Industrial		
	Total sector consumption	110 Mcm/yr
	Brackish content	30 Mcm/yr
	Consumption in Negev	40% of total sector
	Projected increase (2000)	1.40%/yr
	Projected consumption (2000)	135 Mcm/yr
Irrigation		
	Water used (1988)	1300 Mcm/yr
	Amount of land irrigated	215,000 ha

Groundwater Potential and Actual Production, 1985/6–1989/90
(in Mcm/yr)

Reservoir	Potential Production	Average Actual Production	Average Overproduction
Coastal	283	317	34
Mountain	330	379	49
TOTAL	613	696	83

Israeli Withdrawals from Yarmuk River
(in Mcm/yr)

	Normal Conditions	Drought Conditions
Total withdrawal	100	65–85
Diversion to Golan	15	5–10
Diversion to Tiberias	85	60–75
Diversion to Coastal Plain	70	55–70
Diversion to Local Irrigation	15	5

How Deficit Accumulated, 1987–89*
(in Mcm/yr)

	Allocation	Real Usage	Deficit
1987	1793	1800	-7
1988	1793	1886	-93
1989	1737	1912	-175

Domestic Usage, 1986–89
(in Mcm/yr)

	Quota	Actual Use	Deviation %	Average Annual Use Per Capita
1986*	355	423	19.2	97.6 m^3
1987	378	447	18.1	101.4 m^3
1988**	301	399	32.6	107.8 m^3
1989	383	495	29.2	110.0 m^3

* In 1986 a policy decision was made that domestic per capita consumption would not exceed a total of 75 m^3, but the actual amount allowed was 97.6 m^3, setting a pattern for subsequent years. In 1991 actual use varied between 75–100 m^3 per capita.

** Figures for 9 months only

Water Use for Irrigation, 1960–2000
(in Mcm/yr)

	Total Supply	% for Irrigation	Irrigation
1960	1300	77	1001
Oct 1989	2200	67	1474*
Oct 1990	1950	68	1326
2000 (projected)	2100	62	1302

* Confidential source; published Tahal figure for total irrigation water is 1234 Mcm in 1989

Water Use for Irrigation, November 1991
(in Mcm/yr)

	Total Supply	Total Consumption	% for Irrigation	Irrigation	Drought Reduction
Nov 1991	1600	1820*	68	1238	780**

* 220 Mcm/yr deficit
** Israel has reduced water supply for irrigation by 37% in 1991

Irrigation by Crop, 1989*

	Area in (000 ha)		Water Used	
	Non-Irrigated	*Irrigated*	*Mcm/yr*	*% of Total*
Citrus	—	35	256	21
Other tree plants	13	40	303	24
Vegetables	6	30	169	14
Cotton	—	35	171	14
Other field crops	130	72	213	17
Flowers	—	2	22	2
Fish ponds	—	3	100	8
TOTAL	149	217	1234	100

* N.B.: Israel has reduced water supply for irrigation by 37% in 1991

APPENDIX III

ADDITIONAL INFORMATION

Additional Information

1) The Contribution of Agriculture to GDP and Employment

The decade of the 1980s witnessed a decline of employment in the agricultural sector. From a high of 7% of the national labor force at the outset of the decade to 5% by 1989, and down still further to about 4% in 1990–91.

Several factors account for this dimunition, but chief among them are the persistent water shortages and the decline of the kibbutzim and moshavim, the largest employers of farm labor. For economic reasons the kibbutzim have been for several years moving away from farming into small-scale processing and business activities while the moshavim have remained steadfastly wedded to the land. However, inefficiency, poor management, inflation, and the world economic recession have caused the moshavim virtually to collapse in the past year. The kibbutzim and moshavim have accumulated a debt of between $3–5 billion. If the moshavim do not recover, agricultural employment could slip another percentage point by mid-1992. This decline in agricultural labor—and severe water scarcity—presently constitute a significant limitation on the growth of the agricultural sector.

As politically and ideologically important as the agricultural sector has been in Israel, it rarely accounted for more than 5% of GDP (as compared, for example, with 22% for industry and 24% for public services). The reason for this relatively low contribution to GDP has, of course, been the hydrological and economic limitations on significant expansion of irrigated agriculture. Agriculture presently accounts for only a little more than 3% of GDP (down by 0.0185%).

2) Current Uses of the Waters of the Jordan River and Lake Tiberias. (N.B.: These patterns of use are reflected in the data tables of Appendix II.)

As previously indicated, under normal conditions, 500–510 Mcm/yr of Jordan River water flows into Lake Tiberias; 100–110 Mcm/yr are diverted before entering the lake and are used for local irrigation in the Huleh Valley. After such use, some 25 Mcm/yr of those waters are added to the approximately 400 Mcm/yr diverted from Tiberias to the National Water Carrier. Small amounts (10–15 Mcm or so/yr) are used for other local irrigation in the Jordan Valley as drought conditions allow.

During most of the 1980s, water was pumped from Lake Tiberias to replenish the Coastal Plain aquifer—about 55–70 Mcm/yr—which was and continues to be seriously over-exploited. The water drawn out of Tiberias for

this purpose was replaced from the 100 Mcm/yr the Israelis have been taking out of the Yarmuk River. About 70 Mcm replenished Tiberias, 15 Mcm was being sent to the Golan settlements, and the remainder was used for local irrigation until the last couple of years, when drought conditions worsened. Since then, only about 55 Mcm/yr is taken from Tiberias to the Coastal Plain aquifer, and the Israelis remove between 65 and 85 Mcm/yr from the Yarmuk. Of this, 55 Mcm goes to restore what Tiberias gave up to the Coastal Plain aquifer, 5–10 Mcm is sent to the Golan, and the remainder is used to keep Tiberias above the red line.

3) Salinity of the Water from Tiberias and Its Environs That Is Released into the Lower Stem of the Jordan.

The salinity of Lake Tiberias normally varies from 250–400 ppm. The diversion of the saline springs around Tiberias into the Lower Jordan, to maintain the sweetness of the water pumped from Tiberias into the National Water Carrier, raises the salinity level of the lower stem to 2000–2700 pp. by the time it reaches the Dead Sea.