

The Water Rights of the Co-riparians to the Jordan River Basin

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Abstract

Access to sufficient volumes of water of appropriate quality is a vital human need, and the United Nations Committee on Economic, Social and Cultural Rights has recently recognized the human right to water. The co-riparians of the Jordan River basin (Lebanon, Syria, Israel, the occupied Palestinian territories and Jordan) suffer differing degrees of water stress, as measured by international benchmarks. The quantification and attainment of their water rights is thus an important topic, especially as the demand for water is growing throughout the region as a whole.

Previous international agreements amongst the co-riparians concerning water-related topics are addressed, and it is demonstrated that none of these has adequately quantified the water rights of any of the parties. The allocations of the Jordan River proposed by US Ambassador Eric Johnston in the mid-1950s may be thought to represent an important international standard, but also cannot be considered to equate to the full present-day water rights of the co-riparians to that system. This is principally because no regard was given in the work by Johnston to the groundwater resources available to the co-riparians, and the only demand deemed to be of relevance was the use of water for agricultural irrigation.

Customary international water law (evidence of which may be found in *The Helsinki Rules on the Uses of the Waters of International Rivers* of 1966 and the 1997 United Nations *Convention on the Law of the Non-navigational Uses of International Watercourses*) determines the water rights of the parties at the present time in a broad fashion, but provides only general guidance in identifying legitimate quantitative allocations of fresh waters for the co-riparians of the Jordan River.

It is argued that despite such difficulties, quantitative equitable and reasonable allocations can and must be derived for the co-riparians of the Jordan River basin, and such allocations will be a critical component in fully defining the water rights of the parties. One of the key elements in such a process should be the allocation of equal *per capita* volumes of fresh water to the various parties. Equal *per capita* allocations appear a just and reasonable starting point in deriving an equitable apportionment of fresh water for domestic uses, at least.

Even if the water rights of the parties were to be quantified, however, problems would remain in certain parties attaining their rightful allocations of shared watercourses. It is argued that these are mainly due to the existence of a 'zero-sum game' in many such circumstances, where water volumes gained by one party are lost by another party. In the case of the co-riparians of the Jordan River, it is suggested that this problem can be surmounted by the addition of 'new water' to the regional resource, thus generating a 'positive-sum game' where all parties benefit over time. The general pattern of such allocations is proposed, and recent plans for desalination in the region are reviewed, specifically.

The distinction between *water rights* and *water use* is also discussed briefly. It will be important in any future agreements to separate the concepts of water rights and water use, neither of which fully defines the other (either before or after agreements are concluded on water allocations).

Unless international agreements determining equitable and reasonable allocations to the co-riparians of the Jordan River can be concluded (involving each of the parties and all of the water resources, not simply surface waters), none of the parties will understand their water rights, or be able to attain water security in the future. It is in the interest of all the countries in the region to cooperate on the allocation and management of the available water supplies, rather than competing for these. Each of the co-riparians should prepare Master Plans for water use and for the development of new water resources in the future, as a matter of high priority. These Master Plans should recognize international standards; should rely on the cooperative or (preferably) joint management of shared watercourses; and will define a number of strategic aspects of the future economic and social development of the countries involved.

Introduction

The human right to water has been recognized generally but implicitly in a number of international instruments, and specifically for certain protected groups. However, only recently has it been explicitly acknowledged as being a right enjoyed by all under the *International Covenant on Economic, Social and Cultural Rights* of 1966. This treaty (which was ratified by Israel in January 1992 and by the other riparian States to the Jordan River basin in 1976) has now been interpreted to include the human right to water (United Nations, 2002; see also Guissé, 2004; Woodhouse, 2004; McCaffrey, 2005 in press). These authorities suggest that all persons have a right to access to water, and that no distinctions should be made on the basis of colour, creed or other matters.

In the Jordan River valley, several populations exist which are severely water-stressed, as measured by internationally accepted indices (Falkenmark and Widstrand, 1992; Gleick, 1993; Lawrence et al., 2002). This paper discusses the water rights of the co-riparians to the Jordan River basin (Lebanon, Syria, Israel, the occupied Palestinian territories and Jordan), initially by considering the existing

agreements on water allocations between the parties, and then by addressing the proposals of the Johnston Plan of 30 September 1955. The occupied Palestinian territories is referred to hereafter as “Palestine”, and it is assumed that Palestinian Statehood will be declared and internationally recognized, once the permanent status negotiations with Israel are concluded.

It is argued in this paper that the allocations proposed by existing agreements cannot realistically be considered to comply with the principles of customary international water law, and are therefore not equivalent to the water rights of the parties. Additionally, the allocations proposed in the Johnston Plan are not equivalent to the water rights of the parties, as: (i) no account was taken of water resources other than the Jordan River; and (ii) the only demand considered in the Johnston Plan was that for the irrigation of agricultural land.

Customary international water law provides a general basis for the determination of the water rights of the co-riparians to the Jordan River, and this body of law is considered the appropriate platform for such rights to be quantified. The paper cites factors which would assist in determining the water rights of the parties, and it is proposed that equal *per capita* allocations of water between the existing populations could be employed as a reasonable starting point in initial attempts to quantify the water rights of the parties.

The relevance of ‘new water’ to the determination and attainment of the water rights of the co-riparians is also discussed. A proposal is made for the development of the regional water resources, in order to generate a ‘positive-sum game’ which would allow both the reallocation of the existing water resources and the attainment of the water rights of the parties. A recent proposal by Israel for desalination at Hadera/Caesarea is discussed in the light of this, as are plans for desalination in Gaza.

The paper also discusses the distinction between water rights and the actual patterns of utilization of water by the co-riparians. The possibility that patterns of water use may vary from those taken as quantified water rights is important, as it provides flexibility in the attainment of equitable and reasonable allocations of water during transition periods, and also allows parties to trade water resources as they may wish.

Finally, the key importance of the cooperative and/or joint management of international watercourses is emphasized, as this is a critical element of ensuring that any established water rights are respected. It is argued that the co-riparians of the Jordan River should collaborate in developing water resources in the future, rather than competing for the existing resources. Only in this fashion will the parties gain true water security and be able to satisfy their respective demands for water in the future.

Pre-existing International Agreements

Several previous agreements exist between the co-riparians of the Jordan River basin, including the following:

- three separate agreements between the British and French Governments in the period from 1920 to 1926, relating to Palestine, Syria and Lebanon;
- the agreements of 1953 and 1987 between Syria and Jordan, concerning the utilization of the waters of the Yarmouk River;
- the Agreement of 1994 between Syria and Lebanon concerning the Orontes (Al-Asi) River;
- the 1994 Peace Treaty between Israel and Jordan, containing a specific annex on water;
- the Declaration of Principles from 1993 and the Interim Agreement of 1995 between the Palestine Liberation Organization and Israel; and
- the so-called tripartite agreement of 1996 between representatives of Palestine, Israel and Jordan, relating mainly to the development of new water.

Certain other legal instruments are also of tangential relevance, including the *Bahrain Environmental Code of Conduct for the Middle East* of 1994. The agreements discussed above are reviewed briefly here, in relation to their content concerning water rights and connected issues.

Palestine, Syria and Lebanon

It is interesting to note that even the earliest documents listed above refer specifically to allocations of water from the Jordan River system to various co-riparians, and sometimes also to water rights. The Franco-British Convention (1920) notes in Article 8 that:

“Experts nominated respectively by the Administrations of Syria and Palestine shall examine in common the employment, for the purposes of irrigation and the production of hydro-electric power, of the waters of the Upper Jordan and the Yarmuk and of their tributaries, after satisfaction of the needs of the territories under the French mandate.

In connection with this examination the French Government will give its representatives the most liberal instructions for the employment of the surplus of these waters for the benefit of Palestine.”

The Exchange of Notes (1923) between the same parties refers to the demarcation of the border between Syria and Palestine, and serves to clarify certain aspects of the Convention noted above. This states that:

“The Government of Palestine or persons authorized by the said Government shall have the right to build a dam to raise the level of the waters of Lakes Huleh and Tiberias above their normal level, on

condition that they pay fair compensation to the owners and occupiers of the lands which will thus be flooded. Any existing rights over the use of the waters of the Jordan by the inhabitants of Syria shall be maintained unimpaired.”

The Anglo-French Agreement (1926) refers in turn to the Exchange of Notes discussed above, and deals with administrative matters connected to the border. Article III of this document states the following:

All the inhabitants of both territories who, at the date of the signature of this Agreement enjoy grazing, watering or cultivation rights, or own land on the one or the other side of the frontier shall continue to exercise their rights as in the past. They shall be entitled, for this purpose, to cross the frontier freely and without a passport without paying any Customs duties or any dues for grazing or watering or any other tax on account of passing the frontier and entering the neighbouring territory.

The same rights shall be enjoyed by their employees or tenants and by the employees of the latter.

All rights derived from local laws or customs concerning the use of the waters, streams, canals and lakes for the purposes of irrigation or supply of water to the inhabitants shall remain as at present. The same rule shall apply to village rights over communal properties.

While the general intent of these early agreements to protect the historical water rights of the local inhabitants is to be applauded (and it is clear that the parties intended that shared watercourses should continue to be available to the various populations that had depended on them, to that time), no attempt was made to quantify the rights involved.

Syria and Jordan

The Syrian-Jordanian Agreement (1953) relates to the use of the Yarmouk River for both irrigation and hydroelectric power generation, and was intended to preface the construction of the Maqarin Dam. Article 2(a) cites a flow of not less than 10 m³/second for use by Jordan in irrigation, while Article 8 gives Syria the right to use all spring waters arising in its own territory above the 250 metre level, plus water below the dam for irrigation in the lower Yarmouk basin and eastward of Lake Tiberias, or for other Syrian schemes.

The Syrian-Jordanian Agreement (1987) amended certain of the provisions noted above, particularly in allowing Syria to impound water in small earth dams, and to use such resources for irrigation and to support livestock. This was agreed to in return for Syrian support for the construction of the Unity Dam (Al-Wehdah Dam), located close to the site proposed previously for the Maqarin Dam.

It is notable that the water rights of the two parties were only partially quantified by these Agreements, and the fact that neither of the dams has been constructed reduces the utility of both Agreements.

Syria and Lebanon

The Orontes (Al-Asi) River rises in Lebanon and flows through Syria, emptying into the Mediterranean Sea within the Turkish Province of Hatay. The Syrian-Lebanese Agreement (1994) on the division of these waters was concluded in the absence of the third co-riparian, and was only endorsed by the Syrian Parliament in late 2002. Both Lebanon and (especially) Syria have developed the Orontes heavily, and only meagre flows remain in the downstream reaches within Turkey, as a result.

The bilateral agreement allows Lebanon a share of 80 MCM/year from the Orontes, but only in years when the flow within Lebanon amounts to 400 MCM/year or greater. In years when less than 400 MCM/year arises in Lebanon, the Lebanese share decreases by 20%, to 64 MCM/year.

While certain political elements have claimed that Lebanon received a greater share than its water right to the Orontes (Nasser, 2002), this claim is not based on accepted principles of customary international water law. It appears that the division of the available flows was derived through simple negotiation, and no detailed justification for the allocation to Lebanon has been provided. The heavy utilization of the Orontes River in Syria serves to deny Turkey's downstream rights, perhaps in retaliation for the inverse scenario concerning the Euphrates River.

Israel and Jordan

The Israeli-Jordanian Peace Treaty (1994) addresses water-related issues in Article 6, and also in Annex II. Article 6 (1) cites the term "rightful allocations" as opposed to 'water rights'. Shamir (1998, 2002) has implied that this was necessary to defuse sensitivity to the use of either 'water rights' or 'allocations' in the text, although it seems that the precise distinctions between certain of these terms could be debated. Article 6 (2) includes a reference to the avoidance of harm, but the other provisions concerning water in the main text of the Peace Treaty are generic in nature and address mainly the issue of future cooperation between the parties. The details concerning volumetric allocations are provided in Annex II of the Peace Treaty, and allow for the following:

- the abstraction of 25 million cubic metres [MCM]/year by Israel from the Yarmouk River (12 MCM in summer and the remaining 13 MCM in winter);
- the use of waters downstream of point 121 at the Adassiyah Diversion by either party, such that "waste of water will be minimized";
- the transfer of 20 MCM/year by Israel to Jordan in summer, from the Jordan River directly upstream from the Deganya Gates;

- the storage by Jordan of a “minimum average” of 20 MCM/year in the lower Jordan River, south of the confluence with the Yarmouk;
- maintenance of the then-current Israeli uses of Jordan River waters between the confluence with the Yarmouk and that with Wadi Yabis (Tirat Zvi), with an equivalent use by Jordan on the basis that this does not harm Israeli uses; and
- the further provision to Jordan of 10 MCM/year of desalinated water derived from the saline springs in Israel to the north-west of Lake Tiberias, in the winter period and at dates selected by Jordan (this volume to be provided by Israel from the Jordan River until the desalination facility is operative).

Article I (3) of Annex II to the Peace Treaty cites a requirement for the Joint Water Committee (which was also established by the Treaty) to develop a plan for Israel to supply Jordan with an additional 50 MCM/year of water, from a source which was then unidentified. This additional flow has not been provided to Jordan, to date.

It is notable that while certain flows are quantified by the 1994 Peace Treaty, it is altogether impossible to derive an entire picture of the water rights (or “rightful allocations”) relevant to the two parties, from its text. In addition, while Article III of Annex II contains general provisions relating to the protection of water quality, the statement at Article III (4) concerning the quality of water to be provided by one party to the other has certainly been proven to be insufficient to protect the interests of Jordan.

Palestine and Israel

The two main agreements which remain in force between the Palestine Liberation Organization and Israel are the Declaration of Principles (1993) and the Interim Agreement (1995), the latter sometimes also being known as the Oslo II accord.

Annex III to the Declaration of Principles is entitled *Protocol on Israeli-Palestinian Cooperation in Economic and Development Programs*. Clause [1] states that the parties will focus on the following:

“Cooperation in the field of water, including a Water Development Program prepared by experts from both sides, which will also specify the mode of cooperation in the management of water resources in the West Bank and Gaza Strip, and will include proposals for studies and plans on water rights of each party, as well as on the equitable utilization of joint water resources for implementation in and beyond the interim period.”

The use of the term “*equitable utilization*” here is especially notable. The Declaration of Principles pre-dated the 1997 United Nations *Convention on the Law of the Non-navigational Uses of International Watercourses*, and it may be assumed that the term was derived from Chapter 2 of *The Helsinki Rules on the Uses of the Waters of International Rivers* dating from 1966, coupled perhaps to the preparatory

work of the United Nations International Law Commission leading to the 1997 UN Convention (which had adopted on first reading, a complete set of draft articles in 1991). In any event, the term has a highly specific legal meaning, which is widely documented and understood.

The Interim Agreement was signed by representatives of Palestine and Israel on 28 September 1995. Article XXXI of that document requires the parties to reach final agreement on a number of issues, through the completion of permanent status negotiations. The negotiations are intended to include water-related issues.

Topics relating to water and wastewater are addressed by Appendix 1, Annex III to the Interim Agreement (the *Protocol Concerning Civil Affairs*), principally in Article 40 (entitled *Water and Sewage*). This included the recognition by Israel of Palestinian water rights in the West Bank, although these were not quantified; laid down agreements on the coordination of the management of water supplies and of wastewater treatment and disposal for the interim period; and specified additional water resources which should be made available to Palestine during the same interim period. Article 40 [6] states that “... [b]oth sides have agreed that the future needs of the Palestinians in the West Bank are estimated to be between 70-80 mcm/year.” General agreements were also included on mutual cooperation, and on the protection of water resources and infrastructure.

Article XXXI of the Interim Agreement states the following, in Clause 6:

“Nothing in this Agreement shall prejudice or pre-empt the outcome of the negotiations on the permanent status to be conducted pursuant to the DOP. Neither Party shall be deemed, by virtue of having entered into this Agreement, to have renounced or waived any of its existing rights, claims or positions.”

A similar provision is repeated in Article 40 [8] of Annex III, in relation specifically to water resources. Given these provisions, it is clear that the 70-80 MCM/year cited in Article 40 [6] of Annex III to the Interim Agreement cannot be considered as the water rights of the Palestinians. Thus, the Interim Agreement failed to quantify the water rights of either Palestine or Israel.

Palestine, Israel and Jordan

The Tripartite Agreement (1996) arose from the Multilateral Working Group on Water Resources, established initially by the Madrid Peace Conference in 1991. While it was signed by representatives of Palestine, Israel and Jordan, the extent to which it binds these parties may be debated. The agreement states specifically that it will not affect any of the previous bilateral or other agreements between the three parties. Its text is mostly generic, and addresses cooperation in the field of water resources and the allocation of any new water resource. Notably, Clause [3] under the heading *Common Denominators* states that “[d]omestic uses occupy the first priority in the allocation of water resources.” No volumetric estimates of

allocations to the parties are cited, and the agreement therefore fails to quantify the water rights of any of the parties, in any meaningful manner.

Conclusion on the Pre-existing Agreements

It may be concluded that none of the bilateral or other agreements concluded to date between the co-riparians of the Jordan River basin has fully quantified the water rights of any of the parties. Perhaps even more importantly, there is no basin-wide agreement which establishes the shares of the parties in the regional water resources, in a collective fashion.

The Johnston Plan

The Johnston Plan (1955) was finalized on 30 September 1955, after two years of regional negotiations and shuttle diplomacy by US Ambassador Eric Johnston. Several parts of the text of the final document are notable, including the following quotations:

- “.... *the United States believes that the international resources vital to the growth and development of more than one nation should be peacefully and equitably shared.*” [Page 2].
- “.... *the United States insists that the Plan must be equitable in its own judgement. It could not agree to support any project which might, because of basic inequity to one party or another, provoke disputes and possible termination of the understanding on which the Plan was based.*” [Page 4].
- “.... *The result is a Plan for the Valley which, in the opinion of the United States, is equitable, workable, and economically justifiable.*” [Page 6].
- “.... *International law recognizes that each of the nations sharing an international river system has a right to a portion of the water. There is no single, generally accepted principle, however, on which the division of the water can be based.*” [Page 13].

It is clear from these quotations that the basic intention of the Johnston Plan was to derive equitable allocations of the Jordan River for the co-riparians (to be viewed essentially as water rights, although this term was not specifically cited in the Johnston Plan). The method used to attempt this determination involved the computation of the needs for water for agricultural irrigation **only**, for use in Lebanon, Syria and Jordan, with the residual flows being allocated to Israel. The methodology used by Johnston does not comply with modern-day attempts to determine equitable utilization patterns for shared watercourses in two particularly important respects:

- Customary international water law provides a number of factors to be taken into account when determining equitable and reasonable utilization patterns for international watercourses (Table 1). It is clear that the computation of volumetric requirements to satisfy only one type of demand (that for agricultural irrigation) does not match the current philosophy in relation to the determination of equitable allocations.
- Johnston took no account of the groundwater or other surface water available to the co-riparians, and dealt only with the surface waters of the Jordan River system. This also fails to comply with modern methods for attempting to determine equitable allocations of international watercourses, as the availability of other sources of water should be taken into account in this process.

In addition, it is notable that the four co-riparian States addressed by the Johnston Plan were treated in distinct fashions. Thus, Johnston proposed the allocation of sufficient flows to the three Arab States to satisfy the within-basin demand for irrigation, with the residual flow being allocated to Israel and no constraints being imposed on whether this was utilized within the basin, or externally.

It is concluded that the allocations proposed in the Johnston Plan cannot be considered to determine the water rights of the co-riparians of the Jordan River, as these would be calculated at the present time.

Equal *per capita* Allocations

The previous sections of this paper have demonstrated that none of the international agreements entered into to date by the co-riparians to the Jordan River can be considered to have adequately quantified the water rights of those parties, and that the same is the case for the Johnston Plan.

It is argued here that all parties within the Jordan River basin would benefit from a comprehensive agreement on their respective water rights. This is the case even for Israel, as Israel's apparent water security derives merely from its continuing occupation of lands pursuant to the 1967 war (and its superior military power), in direct contravention of many of the principles of international law.

Without detracting from the importance of the factors listed in Table 1, it is proposed that **equality** of water allocation is a desirable starting point for the determination of equitable and reasonable allocations between the parties in the Jordan River basin. This is particularly true in view of the extreme aridity of the area and the consequent shortage of available water on a *per capita* basis, as well as political factors discussed below. In order to allow for the relative population sizes of parties sharing international watercourses, equality of allocation should be determined on a *per capita* basis.

Table 1. The factors to be considered when allocating international watercourses, as included in the Helsinki Rules and the 1997 United Nations Convention.

<i>The Helsinki Rules</i>	<i>The 1997 UN Convention</i>
CHAPTER 2. EQUITABLE UTILIZATION OF THE WATERS OF AN INTERNATIONAL DRAINAGE BASIN.	Article 6 - Factors relevant to equitable and reasonable utilization.
Article V. I. What is a reasonable and equitable share within the meaning of article IV to be determined in the light of all the relevant factors in each particular case.	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:
II. Relevant factors which are to be considered include, but are not limited to:	
1. The geography of the basin, including in particular the extent of the drainage area in the territory of each basin State;	(a) Geographic, hydrographic, hydrological, climatic, ecological and other factors of a natural character;
2. The hydrology of the basin, including in particular the contribution of water by each basin State;	(b) The social and economic needs of the watercourse States concerned;
3. The climate affecting the basin;	(c) The population dependent on the watercourse in each watercourse State;
4. The past utilization of the waters of the basin, including in particular existing utilization;	(d) The effects of the use or uses of the watercourses in one watercourse State on other watercourse States;
5. The economic and social needs of each basin State;	(e) Existing and potential uses of the watercourse;
6. The population dependent on the waters of the basin in each basin State;	(f) Conservation, protection, development and economy of use of the water resources of the watercourse and the costs of measures taken to that effect;
7. The comparative costs of alternative means of satisfying the economic and social needs of each basin State;	(g) The availability of alternatives, of comparable value, to a particular planned or existing use.
8. The availability of other resources;	
9. The avoidance of unnecessary waste in the utilization of waters of the basin;	
10. The practicability of compensation to one or more of the co-basin States as a means of adjusting conflicts among uses; and	
11. The degree to which the needs of a basin State may be satisfied, without causing substantial injury to a co-basin State.	
	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.
III. 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 reasonable and equitable share, all relevant factors are to be considered together and a conclusion reached on the basis of the whole.	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 use, all relevant factors are to be considered together and a conclusion reached on the basis of the whole.

Assigning equal *per capita* volumes of water to the various co-riparians of the Jordan River would seem to comply with the principles of the *International Covenant on Economic, Social and Cultural Rights* which was cited previously (and which has been ratified by all the States in the basin), including the recent elaboration of the human right to water, on the basis of the rights enshrined in this treaty (United Nations, 2002; Guissé, 2004; Woodhouse, 2004; McCaffrey, 2005 in press).

Support for the concept of equal *per capita* shares of water for populations in the region has been voiced by several parties previously. Shuval (1992, 2000) suggested that 125 cubic metres/person/year (equivalent to 342 litres/person/day) would be an appropriate volume for 'domestic, urban and industrial use' for both Israelis and Palestinians, with supplies for agriculture being additional to this currently but deriving mainly from recycled wastewaters in the future. In support of these proposals, Shuval (2000) has argued strongly that there is no basis for discrimination between the populations in this respect and that many parties on both sides have accepted this principle. Isaac (1994) has proposed essentially the same concept, which he termed 'water equity' between the two populations. Interestingly, the report of the Parliamentary Committee of Enquiry on the Israeli Water Sector (PCE, 2002) stated in its conclusions that:

"The Committee avoided dealing with the agreements for the supply of water and the diversion of desalinated seawater to Jordan and the Palestinian Authority. These issues are in the hands of the appropriate political forums. At the same time, the Committee is aware of the fact that the inhabitants of the Palestinian Authority, as well as the inhabitants of Jordan, are suffering from a shortage of water resources, and it therefore calls upon the political echelons to find the golden path to fulfill the requirements of all the above mentioned inhabitants, on an equal and just basis." [Paragraph 15 of Section 3.0 of the report].

It is suggested here that in the politically charged atmosphere of the Jordan River basin, any solution to the equitable allocation of international water resources would be attacked by a party that was disadvantaged in relation to *per capita* allocations. If the proposals for allocations cited by Shuval (1992, 2000) were to be followed, the combined populations of Israel and Palestine (numbering 10.38 million, presently) would utilize about 1,300 MCM/year of the regional water resources for domestic, urban and industrial use. This amounts to about 53% of the total water resource available to these two parties in an average year, which would leave a reasonable margin to support agricultural activities, at least at the present time. However, it is notable that population growth rates are high in both Israel (due mainly to immigration) and Palestine (because of natural organic growth, perhaps to be augmented by returnees in the future). This implies that the percentage of the resources allocated to domestic, urban and industrial needs would continue to grow, with less water being available for the agricultural sector over time, as envisaged by Shuval (1992, 2000). This would not be particularly problematic in an economic sense for Israel, as agricultural products contribute only about 2% to their Gross

Domestic Product. However, agricultural production is far more important to the Palestinian economy, and it is clear that major changes will be needed in the agricultural sector in the future. One such change would be an increase in the re-use of treated wastewaters over time, which is already occurring in Israel (Dreizin, 2004a).

The situation in Jordan is distinct from the scenarios in Palestine and Israel, as regards water availability and potential allocations to the agricultural sector. The *per capita* availability of water at present is about 70 cubic metres/year in Palestine; 160 cubic metres/year in Jordan; and 330 cubic metres/year in Israel. If the Jordanians were to utilize the same volumes as proposed by Shuval (1992, 2000) for purposes other than agriculture, this would amount to about 700 MCM/year, or a massive 80% of their available water resource. This assumes the continuing use of fossil sources of water by Jordan (mainly from the Disi Aquifer), and it is clear that Jordan faces severe water stress in the near future and will certainly have difficulty meeting the ongoing demand in the agricultural sector. The recent increase in wastewater re-use in parts of Jordan is a testament to this trend (Fardous and Al-Hadidi, 2004).

Generating a Positive-Sum Game, Using New Water

If the water rights of the co-riparians to the Jordan River basin were to be fully quantified, these would not match the present pattern of water distribution amongst the parties. To achieve an equitable distribution (with the parties attaining their water rights), the reallocation of water would be required. This would normally amount to a 'zero-sum game', where the water gained by one party would be lost by another party.

This is a critical disadvantage which needs to be faced by any parties seeking to attain their equitable rights to shared watercourses. However, in the case of the Jordan River basin, such a disadvantage can be defused by generating a 'positive-sum game', through the addition of new water to the pre-existing resources. This would allow all of the co-riparians to attain their water rights over time, without creating appreciable harm to any party.

The present status and future needs for water amongst the various co-riparians can be viewed generically as follows:

- Lebanon is relatively water-rich compared to the downstream co-riparians, with a *per capita* water availability exceeding 1,100 cubic metres/year. Minor additional volumes of water could be desirable within the Lebanese portion of the Jordan River basin in the future, but the overall flow requirements have never approached those estimated in the Johnston Plan (35 MCM/year), and the additional volumes involved in possible future uses are small.
- Syria is also relatively water-rich when considered as a whole, with a *per capita* water availability similar to that of Lebanon. As noted above in relation to the 1987 Al Wehdah Agreement, Syria has constructed impoundments on the

Yarmouk River in recent years to increase its storage capacity in the absence of the Maqarin Dam, feeding irrigation water to local agriculture. It is considered unlikely that Syria's future requirements for water within the Jordan River basin will be significantly above the flows taken at present, which average about 260 MCM/year. There would, however, be merit in discussions between Syria and Turkey to address the equitable allocation of the waters of the Euphrates River.

- Israel over-abstracts from the Jordan River basin and also from the other West Bank aquifers which do not drain to the basin, by comparison to its equitable entitlement. A shift to equitable and reasonable allocations would require a reduction in abstraction rates by Israel from these sources, but this could be compensated for over time by the additional development of new water. Israel is in an excellent position to achieve this solution, due to its strong technological base; high *per capita* income; and extensive Mediterranean Sea coastline. The current plans for developing new water in Israel reflect this, with a total of 415 MCM/year to be developed over only five years by the desalination of marine waters and the importation of 50 MCM/year from Turkey (Dreizin, 2004a, 2004b). These volumes will be augmented further by reclaimed flows totalling 55 MCM/year from the desalination of brackish groundwater (Arlosoroff, 2004; Dreizin, 2004a), and the continuing increase in the use of wastewater over time for agricultural irrigation.
- Palestine is presently by far the most water-stressed of the co-riparians to the Jordan River. Significant additional water volumes are required, if equitable allocations are to be attained. Some of these should be derived from the reduction in Israeli withdrawals from the shared watercourses noted above, and most of the remainder could be generated through the development of desalination in Gaza. Gaza faces particularly challenging problems if the current population growth rates are to continue, and the importation of water from other sources will be needed if the Gaza sub-aquifer is to be protected adequately in the future.
- Jordan is also heavily water-stressed, and has relatively few options for increasing its total water resource (most of these involving desalination). The Red Sea – Dead Sea conduit could offer the possibility of significant desalinated flows (amounting to up to 570 MCM/year for Jordan), but the water produced would be expensive in regional terms and would only be available in any quantity for a time-limited period (probably about 20 years, depending on the rates of pumping to refill the Dead Sea basin). Other options available to Jordan include desalination at the Aqaba coast, or the importation of water. However, it might also be possible to renegotiate the terms of the 1994 Peace Treaty with Israel, if the 'positive-sum game' relating to Israel could be put fully into place.

To date, the Israeli authorities have responded to these problems with an inflexible adherence to their existing use of the regional water resources. The Israeli position in the bilateral negotiations with Palestine has been to ignore the relevance of customary international law, and to argue for a "pragmatic approach" (no doubt leading to further minor 'concessions' similar to those in the Oslo II Agreement).

Where this appears likely to fail, the Israeli position shifts to an attempt to cite ‘prior use’ (or perhaps ‘existing use’) as a controlling factor in determining equitable allocations of water, at least relating to Israel and Palestine. None of these approaches or arguments fits with the citation of “equitable utilization” in the Declaration of Principles as noted previously in this paper and as supported by international law, as:

- customary international water law binds States whether they have signed agreements or otherwise;
- there is no logical basis for a “pragmatic approach” which would derive additional volumes to be ‘conceded’ to Palestine as part of a future agreement;
- such minor volumes as may be ‘conceded’ by Israel in any repetition of the approach taken by the Oslo II accord would be insufficient to meet the needs of Palestine, or to generate equality (or even a measure of basic equity) between the populations;
- there is no incentive for Palestine to agree to accepting further minor ‘concessions’ when it is clear that equitable allocations are the key objective of relevance;
- ‘prior use’ or ‘existing use’ is not a controlling factor under customary international law, but simply one of the many factors involved in determining equitable and reasonable allocations of shared watercourses (see Table 1); and
- Israel’s ongoing use of water within the political borders of Palestine is altogether in contravention of the law on belligerent occupation, and cannot therefore be used to justify a claim relating to ‘prior use’ (at least since the beginning of the occupation in 1967), or ‘existing use’.

It is most unfortunate that the mediator for the bilateral negotiations between Israel and Palestine has apparently accepted the Israeli arguments against equitable and reasonable allocation, and is even prepared to offer finance for ‘new water’ schemes for Palestine, perhaps in an attempt to generate agreement between the parties. It is clear that the development of new water should not be considered to replace the need for the equitable and reasonable allocation of shared water resources. The history of water-related disputes between states in the USA generally supports the key nature of the principle of equitable and reasonable allocation of shared watercourses, and there is no acceptable rationale for this principle to be ignored in the process of determining water rights in the Jordan River basin.

The most recent scenario proposed by Israel as a solution to the bilateral imbalance with Palestine relates to desalination at Hadera/Caesarea on the Mediterranean Sea coast, with desalinated flows to be pumped to Tulkarem in the West Bank (Shamir, 2004). This scheme may fit into Israel’s so-called “pragmatic approach” to solving water-related issues, but can be criticized on many grounds, including:

- the attempt by Israel to minimize the unit costs of water by writing-off most or all of the capital cost of the desalination facility, on the assumption that this will be covered by grants from the USA or the broader donor community;
- the general opacity of the arrangements whereby Palestine could ensure that Israel would not control the desalinated flows;
- the fact that the desalinated supply would reach an area of the West Bank where demand is low, and would need significant further transfer to greater demand centres with very high attached costs for further pumping and transmission; and
- the attempt to replace water under the feet of the Palestinians in the West Bank with desalinated supplies from a considerable distance, while Israel continues to abstract the flows from the Western Aquifer Basin, which should be equitably shared with Palestine.

If desalination is to proceed at Hadera/Caesarea, it is clear that the flows produced should be allocated to the Israeli coastal and near-coastal population, with the West Bank residents being permitted to utilize their own water resource from the productive zones close to the Green Line. Only in this fashion can the overall costs be minimized (and the water rights of the parties be respected).

A further note is needed here on the situation in Gaza in relation to water supplies. The existing groundwater in Gaza is of exceptionally poor quality, with very high levels of salinity, nutrients, and other trace contaminants. The so-called Gaza Aquifer (which is in reality a portion of the Coastal Aquifer) is believed to possess a sustainable yield of 50-60 MCM/year, but the current abstraction rates (mostly by Palestine) are approximately 140 MCM/year. This scale of over-abstraction cannot continue if the aquifer is to be utilized in the future. While there may be a need in the future to transfer water to Gaza from the West Bank through the territorial link, it is clear in any event that desalination will be required to provide high-quality potable supplies in Gaza. The completion of the construction of the so-called regional desalination facility under US AID financing is a critical need in this respect, and this should be considered of the highest priority. Such supplies could constitute a portion of Palestine's future water rights, at least under the scenario generated by the 'positive-sum game' discussed above. However, even at its ultimate capacity of 55 MCM/year, the regional desalination facility would provide only a small percentage of Palestine's water rights.

Water Rights and the Use of Water

This paper argues throughout that the quantification of water rights as preferred volumetric (or better yet, percentage) allocations to co-riparians is a deeply important element of the management of shared watercourses.

However, it is most important to note that the patterns of actual water use by co-riparians do not necessarily need to match the allocations agreed as water rights. Once the parties have agreed their water rights, each of the co-riparians may

consider a range of options for the use of water over time, and one such option is to trade flows with neighbouring countries. In the scenario described above for generating a 'positive-sum game' amongst the Jordan River co-riparians, it would be likely that water trading would be a preferred strategy for several of the co-riparians, over time. It is also possible that the future strategies of certain of the co-riparians would involve a reduction in water volumes allocated to agricultural sector, to allow water to be traded as an alternative.

The Joint Management of Shared Watercourses

If the water rights of the co-riparians to the Jordan River are quantified and are to be the subject of a multilateral agreement (or perhaps a series of bilateral accords), the parties involved will certainly all wish to ensure that such international agreements are respected.

The cooperative or (preferably) joint management of shared watercourses is the rational solution to this demand to ensure that agreements on water rights are respected. Such a style of management is needed in any event for the existing shared resources, but would be of even greater importance if the parties were to develop new water over a period of time (alongside the reallocation of existing resources) in the 'positive-sum game' noted previously.

The joint management of shared watercourses is a relatively easy objective to attain from a technical viewpoint, and should rely on telemetry data (which can extend to both quantity and water quality) from key nodes in the networks, such data to be available to both or all of the parties sharing particular watercourses. Joint management forums would also be the best vehicle for decisions on the sustainable yields of watercourses year-on-year, and international agreements should take account of the effects of annual flow variations on the water rights of the parties. As noted previously, one method to achieve this involves the use of percentage allocations (based on an agreed sustainable yield) to determine the water rights of parties, rather than specific volumetric allocations.

A further important aspect of determining and agreeing the water rights of the Jordan River co-riparians involves the elevated responsibility of the parties to sustainably use the resources they are allocated. None of the co-riparians produces coherent Master Plans for the use of the water resources at present, and the impacts of future population growth in the region as a whole have not been assessed in any robust fashion. This should be addressed in the future, preferably in a collaborative fashion, using international norms and standards as a platform for the future regional management of the resources. It is clearly in the interests of all five co-riparians to cooperate on the future use of the regional water resources, rather than to compete for them, as at present.

Conclusions

It is concluded that none of the previous bilateral or other agreements between the co-riparians of the Jordan River basin has adequately established the water rights of

any of the parties. The Johnston Plan also failed in this respect, for a number of key reasons.

Despite such past difficulties, it is considered that the five co-riparians to the Jordan River should seek to agree their respective water rights as part of a multilateral agreement, without further delay. The principles of customary international water law assist in this, as would the use of simple standards such as the allocation of equal water volumes *per capita* for domestic use, at least (defusing ethnic and other forms of competition for such natural resources, which have no rational basis).

The attainment of a basin-wide agreement on water rights of the co-riparians should be coupled to the reallocation of the existing resources, over time. This will be successful only if a 'zero-sum game' can be avoided, and new water is made available to replace water lost by certain parties. A 'positive-sum game' can be generated relatively simply for the region, as is evidenced by Israel's present plans for producing 'new water'. It is in the interests of all parties in the region to cooperate over the future allocation of the available water resources, rather than competing for these. It is also of critical importance that the resources are managed in a sustainable fashion in the future, and cooperative or joint management forums will be required to achieve this key objective.

Anglo-French Agreement (1926). *Agreement of Good Neighbourly Relations Concluded between the British and French Governments on Behalf of the Territories of Palestine, on the One Part, and on Behalf of Syria and Great Lebanon, on the Other Part. Signed at Jerusalem, February 2, 1926.*

Arlosoroff, S. (2004). Water demand management – a strategy to deal with scarcity. Israel – a case study. 2nd Israeli-Palestinian International Conference on Water for Life in the Middle East, Antalya, Turkey, 10-14 October 2004. Israel/Palestine Center for Research and Information, Jerusalem.

Declaration of Principles (1993). *Declaration of Principles on Interim Self-Government Arrangements. (September 13, 1993).* Signed at Washington, D.C.

Dreizin, Y. (2004a). Water development and management in Israel and the region: The overall perspective. 2nd Israeli-Palestinian International Conference on Water for Life in the Middle East, Antalya, Turkey, 10-14 October 2004. Israel/Palestine Center for Research and Information, Jerusalem.

Dreizin, Y. (2004b). The impact of desalination. Israel and the Palestinian Authority. 2nd Israeli-Palestinian International Conference on Water for Life in the Middle East, Antalya, Turkey, 10-14 October 2004. Israel/Palestine Center for Research and Information, Jerusalem.

Exchange of Notes (1923). *Exchange of Notes Constituting an Agreement between the British and French Governments Respecting the Boundary Line Between Syria*

and Palestine from the Mediterranean to El Hamme, Paris, March 7, 1923. Initially signed in Beirut on 03 February, 1922.

Falkenmark, M. and C. Widstrand (1992). *Population and water resources: A delicate balance.* Population Bulletin, Population Reference Bureau.

Fardous, A.-N. and L. Al-Hadidi (2004). Wastewater management and reuse in Jordan. 2nd Israeli-Palestinian International Conference on Water for Life in the Middle East, Antalya, Turkey, 10-14 October 2004. Israel/Palestine Center for Research and Information, Jerusalem.

Franco-British Convention (1920). *Franco-British Convention on Certain Points Connected with the Mandates for Syria and the Lebanon, Palestine and Mesopotamia, Signed at Paris, December 23, 1920.* The League of Nations, Treaty Series, **22**, p. 355.

Gleick, P.H. (1993). Water and conflict: Fresh water resources and international security. *International Security*, 18 (1): 99-104.

Guissé, E-H. (2004). *Final Report of the Special Rapporteur.* Commission on Human Rights, Sub-Commission on the Promotion and Protection of Human Rights, Fifty-sixth session; document coded E/CN.4/Sub.2/2004/20.

Interim Agreement (1995) *The Israeli-Palestinian Interim Agreement on the West Bank and the Gaza Strip. Washington, D.C. September 28, 1995.*

Isaac, J. (1994). Core issues of the Palestinian-Israeli water dispute. In *Environmental Crisis: Regional Conflicts and Ways of Cooperation* (K.R. Spillmann and G. Bachler, Eds.). Proceedings of an International Conference at Centro Stefano Franscini, Ascona, Switzerland, 2-7 October 1994. ENCOP Occasional Paper, No. 14. Swiss Federal Institute of Technology, Zurich and Swiss Peace Foundation, Berne.

Israeli-Jordanian Peace Treaty (1994). *Treaty of Peace between the State of Israel and the Hashemite Kingdom of Jordan. October 26, 1994.*

Johnston Plan (1955). *The Jordan Valley Plan. 30 September 1955.* 19 pp.

Lawrence, P., J. Meigh and C. Sullivan (2002). *The Water Poverty Index: An International Comparison.* Keele Economics Research Papers 2002/19, Keele University, England.

McCaffrey, S.C. (2005, in press). The Human Right to water. In *Water and International Economic Law* (E.B. Weiss, L.B. DeChazournes and N. Bernasconi-Osterwalder, Eds.), Oxford University Press.

Nasser, C. (2002). Beydoun praises Orontes River Agreement. Deal allows dam for Bekaa, Hermel. *The Daily Star, Lebanon*, 04 December 2002.

PCE (2002). *Parliamentary Committee of Enquiry on the Israeli Water Sector. Headed by MK David Magan. Report.* Jerusalem, June 2002.

Shamir, U. (1998). Water agreements between Israel and its neighbors. *Yale F&ES Bulletin*, **103**, 274-296.

Shamir, U. (2002). Jordan River Case Study, Part II: The negotiations and the water agreement between the Hashemite Kingdom of Jordan and the State of Israel. (With notes from M. Haddadin). UNESCO International Hydrological Programme contribution to the World Water Assessment Programme, IHP-VI Technical Documents in Hydrology, PC-CP Series, No. 15. UNESCO, Paris.

Shamir, U. (2004). Testimony to the Committee on International Relations of the US Congress House of Representatives on 05 May 2004, the hearings being entitled *Water Scarcity in the Middle East: Regional Cooperation as a Mechanism towards Peace*.

Shuval, H. (1992). Approaches to resolving the water conflicts between Israel and her neighbors – a regional Water for Peace Plan. *Water International*, **17**, 133-143 (1992).

Shuval, H. (2000). A proposal for an equitable resolution to the conflicts between the Israelis and the Palestinians over the shared water resources of the Mountain Aquifer. *Arab Studies Quarterly*, **22 (2)**, 33-62.

Syrian-Lebanese Agreement (1994). *Bilateral agreement, Act No. 15 concerning the division of water of Al-Asi River (Orontes) between the Syrian Arab Republic and the Lebanese Republic.* September 20, 1994.

Syrian-Jordanian Agreement (1953). *Agreement between the Republic of Syria and the Hashemite Kingdom of Jordan Concerning the Utilization of the Yarmuk Waters. Signed at Damascus, on 4 June 1953.*

Syrian-Jordanian Agreement (1987). *Al Wehdah [Unity] Dam Agreement, November 23, 1987.* Syrian Law No. 32, Official Gazette of 09 December 1987.

Tripartite Agreement (1996). *Declaration on Principles for Cooperation on Water-related Matters and New and Additional Water Resources. (February 13, 1996).*

United Nations (2002). General Comment No 15 of the Committee on Economic, Social and Cultural Rights entitled *The right to water (arts. 11 and 12 of the International Covenant on Economic, Social and Cultural Rights)*. UN Document E/C.12/2002/11, 26 November 2002.

Woodhouse, M. (2004). Threshold, reporting, and accountability for a Right to Water under international law. *Water Law Review*, **8 (1)**, 1-29.