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Legal Aspects of Transboundary River Basins in The Middle East: The Al Asi (Orontes), The Jordan and The Nile

ABSTRACT

One of the major issues to be discussed in the current peace negotiations concerning Israel and the Occupied Territories, as well as attempts to promote cooperation in the Nile basin, will be the question of the allocation and management of water resources in an area which is water deficient. In this article an analysis is made of the legal situation of three international river basins in the Middle East: the Al Asi (Orontes), the Jordan and the Nile, in order to determine the respective rights and obligations of the co-basin states to the waters of each basin. Starting with a description of the geophysical aspects of each river, the author gives an account of the existing works and plans of the respective governments for the development of each river and presents a history of their legal positions. Each of these basins has its own particular problems, and for each case regional or local solutions for cooperative arrangements from the legal standpoint are tentatively put forth. The three basins have been selected because of their similarity in an arid area.

INTRODUCTION

The transboundary rivers of the Middle East are a major concern to the countries of the region. In an area of water scarcity where water is a major component of economic and social development, indeed a limiting factor to this development, the competition for a share of these waters is a matter which the concerned countries are ready to fight for to the last breath. As one author has put it, "Either equity in the share of waters or die."¹

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1. O. Genckaya, Interdependence, Cooperation and Conflict Resolution: A Critical Assessment of Peace-Pipeline Project, Address Before the First Conference of the European Peace Research Ass'n, Florence, Italy (Nov. 8-10, 1991).

The relevant legal and institutional aspects are, therefore, a question to be dealt with in any negotiation, and no political settlement can be envisaged without first providing a solution to the water issues.

The responsible leaders in the Middle East speak about "security," meaning "water security." After signing the peace treaty with Israel, President Anwar Sadat declared that "the only matter that could take Egypt to war is water."² These leaders feel that access to water—the Tigris, Euphrates, the Nile, the Al Asi (Orontes) and the Jordan—are threatened by non-Arab countries. This situation requires concerted policies, organizational and consultative structures based on international agreements. However, the States of the region do not trust one another. This lack of confidence may be overcome by military force or by creating projects which can build up this confidence.

Any solution must rely on agreements based on sound legal principles for the apportionment of the water, including the setting up of modern water management institutions on a local and regional basis. Among the possible suggestions which have come to fore would be the creation of an open market for water to promote cooperation in the area.³

This article will examine the situation in several international basins: the Al Asi (Orontes), the Jordan and the Nile. It should be kept in mind that the relative value of the technical data reported in the sections which relate to development plans and existing works are merely indicative of the major steps that have been taken.

THE AL ASI (ORONTES) RIVER BASIN

The Al Asi is an international river that originates in Lebanon in the Hermel Hills. It flows north through Syria towards Homs, then towards Hama, and later takes a western direction, becoming the Syrian-Turkish frontier for about 32 kilometers. It then swings west and southwest for about 88 kilometers through Turkey before entering the Mediterranean Sea in the Suweida Gulf.

In Lebanon, the Al Asi's length is approximately 40 kilometers. In Syria, it enters Homs Lake (Qattinah) about 16 kilometers from the Lebanese border; the lake itself is some 16 kilometers long. The Al Asi traverses the Acharneh Plain for 24 kilometers and then enters the Ghab Valley, which is over 48 kilometers in length. From the lower end of

2. *Id.* at 5.

3. H. Zarour & J. Isaac, *Nature's Apportionment and the Open Market* 32, Address Before the Conference on The Middle East Water Crisis, Univ. of Waterloo (Can.) (May 7-9, 1992).

the valley to the Turkish border, the Al Asi's length is about 40 kilometers. The river is augmented by a number of small tributaries and springs on its course through Syria, but its principal sources are the Kurusu, which joins it shortly above Antioch in Turkey, and the famous Antioch Springs. The river's length in Turkey is about 88 kilometers.

The Al Asi River is utilized intensively for irrigation in Lebanon and Syria; the Homs-Hama canal irrigation system and the Ghab and Roudji irrigation schemes are noteworthy in this respect.⁴ Before Homs, there is Zeite Dam, built in 1988; another small dam is at Qattinah Lake, originally built by the Romans and rebuilt during the French period. A third dam, built in 1960, is to be found midway between Homs and Hama at a small town called Rastan.

The water of the Al Asi is utilized for irrigation and, to a limited extent, for power production. Two large factories also exist: one, an oil refinery located near the Qattinah Lake, was built in 1957; the other, a fertilizer production plant (Ammonia Yoria) located at the west bank of Qattinah Lake, was built in 1976. These factories cause pollution which the Syrian government is taking steps to control.

With regard to development plans, the first project on an international river considered by the World Bank was the Ghab Project. The loan for this project ultimately was not executed because of the lack of agreement between the countries concerned. This landmark project did, however, establish the procedural rules that the World Bank subsequently followed in financing water resources plans located on international streams.

The Ghab Project was formulated in 1950 when Syria requested financing from the World Bank. The plan was to drain a swampy area of 30,000 to 32,000 hectares, and to convert it into cultivatable land supplied with water for irrigation. The Bank, concerned about the international aspects of the project, insisted that: (a) there be no danger to the project from an upstream riparian country (i.e., Lebanon); (b) a downstream riparian country (i.e., Turkey) could not lodge a substantive protest because of harm to existing uses; and (c) neither upstream nor downstream riparian countries could lodge a substantive protest on account of damage to potential uses.⁵ In this connection, the Bank considered at least four possible approaches: (a) to treat the Al Asi River and its basin as an entity and to consider projects only if they were part of a comprehensive scheme; (b) to require the assent to a project by all riparian countries; (c) to follow the doctrine of estab-

4. D. Warrinet, *Royal Inst. of Int'l Affairs, Land Reform and Development in the Middle East* 79 (1957); U.N. *Economic Development in the Middle East*, at 16 (Sales No. 1957.11.C.2) (1955).

5. World Bank Report (June 8, 1955).

lished uses and to recognize only vested rights; and (d) to be flexible in approach and to treat each project on its own apparent merits and effects.⁶

The Bank was satisfied that the Ghab Project would not affect Lebanon's water supply, but determined that already existing uses in Syria would be severely harmed if Lebanon withdrew a greater amount. Additionally, Turkish-Syrian relations were very strained, and it was expected that Turkey would object on the grounds that the plan did not conform to an agreed settlement of rights on all rivers shared by Turkey and Syria. Turkey had also protested a diversion of water from the Afrin River. This desire for an overall settlement was the reason given for Turkish failure in 1952 to ratify an agreement with Syria, which agreement had been negotiated concerning the water of the Jagh and the Balikh, tributaries of the Euphrates River.

In its objection to the Ghab Project, Turkey could, in the opinion of the Bank, claim that the project, by reducing the total volume or by reducing the minimum summer flow, or both, would prevent the irrigation of certain lands which it might wish to irrigate at some future date or would prevent the installation of a hydro-electric plant to furnish future power needs.

In conclusion, the Bank was of the opinion that: (a) there was no real risk that possible uses of water for irrigation before the river enters Syria would have endangered the project; (b) the project would have controlled winter floods of the Al Asi and thus benefit the entire valley to the north; and (c) there would have continued to be sufficient summer flow of water below the Ghab to provide adequate water for all land then irrigated, and for all irrigable land not irrigated at the time in the valley between the Ghab and the mouth of the Al Asi River.⁷

After the World Bank received Turkey's objection to the project, Turkish and Syrian experts met in Damascus, and their findings were summarized in a Turkish communication. These experts concluded that Turkish territory would be subject to frequent flooding during construction and that the project as it stood would not leave "a drop of water" for Turkey during irrigation seasons.⁸ Later, in 1960, a United Nations expert said, concerning the Al Asi's water which was under discussion between Syria and Lebanon, that Lebanon had the prior right to the use of about 485 million cubic meters of this water (MCM/yr.) per year, because the Al Asi's headwaters are in Lebanon.

In 1962, Syria engaged the services of the Netherlands Development Corporation (NEDECO), a Dutch firm, to prepare a plan providing for the development of the Al Asi River. This plan considered

6. World Bank Report (June 29, 1955).

7. Report of Mr. Black to the Bd. of the World Bank (Dec. 22, 1955).

8. Letter from the Counselor of Turkey to the World Bank (May 3, 1956).

the projects in Syria without mentioning the requirements, interests, and acquired rights of Turkey; some solutions presented in the plan were considered to be against the interests of Turkey. During a conference between engineers from both countries, the Turkish delegation proposed the adoption of a draft protocol containing the following main items on the actions to be taken in collaboration: (a) preparation of a development plan for the Al Asi River, which plan would best serve the interests of the two countries and assist in their development; (b) determination of the necessary flood control measures; (c) review and revision of the NEDECO plan by giving due consideration to the above items (a) and (b); (d) determination of the feasibility of constructing a dam at the border for meeting the irrigation water requirements of the Amik lan in Turkey; and (e) establishment of joint stream-gauging and flood-warning stations.⁹ The conference, however, ended without an agreement being reached on the protocol.

Other plans and projects were presented subsequently.¹⁰ During the past few years, Syria and Lebanon have not been in a position to discuss these issues. Turkey apparently has offered unofficially to let Syria divert the whole of the Al Asi's waters before it enters into Turkish territory.¹¹ The question is whether Syria has notified the other states sharing the basin of Syria's intention to undertake the works.

There are a number of formal agreements, summarized below, which concern the Al Asi basin and date from the time of the French Mandate. The provisions of these agreements are inadequate under the present circumstances.

1. Treaty between France (for Syria) and Turkey of 20 October, 1921.¹² Article 12 of this treaty speaks about "water apportionment" and water supply for the city of Aleppo, without going into detail.

2. Agreement signed in Jerusalem on February 2, 1926, by the United Kingdom (U.K.) (for Palestine) and France (for Lebanon).¹³ Relating to good neighborly relations between these countries, this agreement deals with animal watering rights, customary water use rights, water supply, and navigation.¹⁴

3. Convention of friendship and good neighborliness, with protocol and notes, signed on May 30, 1926, by France (for Syria) and Turkey,

9. N. Karatekin & O. Akyurek, *Agreements on International Streams*, in *Adaptation of Water Laws of Turkey to Changing Conditions and Her Bilateral Agreements on International Streams*, U.N. Conference on the Application of Science and Technology, E/Conf/.39/A/155 (Oct. 1962).

10. M. Addad Sweilem, *Principles and Procedures used in Planning and Executing the East Ghor Canal Irrigation Project*, Address Before the Int'l Conference on Water for Peace, Washington, D.C. (May 23-31, 1967).

11. Private communication to the author.

12. 54 L.N.T.S. 178 (1921).

13. 56 L.N.T.S. 79 (1926).

14. See *id.* art. 3.

relating to the provision of water supply for Aleppo and for irrigation.¹⁵

4. Protocol of May 3, 1930, delimiting the border between Syria and Turkey, signed by France and Turkey.¹⁶ This protocol consisted of a report of the Mandate to the League of Nations. It deals with, among other things, equitable utilization with respect to navigation, fishing, and industrial and agricultural uses of common waters. The validity of these provisions has been questioned by Syria.

There are other agreements which are not relevant to the question of the use of water. These agreements deal with issues such as freedom of transit, settlement of frontier questions, commerce, and navigation.¹⁷

Most of these agreements described above date from the trusteeship period, when Lebanon and Syria could not express their own views, and Turkey was not in a position seriously to assert its rights. It is now necessary that a new agreement be reached among the basin states of the Al Asi. As a consequence of the lack of an adequate institutional framework based on sound and modern requirements and legal principles between the co-basin states—Lebanon, Syria and Turkey—it is difficult to establish cooperative arrangements for reasonable and equitable sharing in the use of the waters of the Al Asi basin.

THE JORDAN RIVER BASIN

The co-riparians of the Jordan River basin are Lebanon, Israel, Jordan, and Syria. The headwaters of the Jordan River are formed by four main streams which unite below Banyas and flow into the former Huleh Marshes: the Nahr Leddan, the Nahr Banyas (Syria), and the Nahr Braghith and Nahr Hasbani (Lebanon). From there the Jordan falls below sea level, rushing down 280 meters in 14 kilometers to a delta opening into Lake Tiberias. This lake occupies an area of about 100 square kilometers at 210 meters below sea level; the evaporation from the lake amounts to about 300 MCM/yr. From Lake Tiberias up to the Dead Sea, the Jordan follows a valley usually not more than 6.4 kilometers wide, with the exception of the two small plains of Beisan and Jericho. The Jordan runs for about 100 kilometers before reaching the Dead Sea at an elevation of 392 meters below sea level.

The Jordan River has two major tributaries, both of which are on the eastern bank: (a) the Yarmuk or Hiejromax, the headwaters of

15. Convention of Friendship and Good Neighborliness, May 30, 1926, Fr.-Turkey, art. 13, 54 L.N.T.S. 195 (1926).

16. U.N. Doc. ST/LEG/SER.E/12 (1930).

17. See, e.g., 54 L.N.T.S. 179 (1921); League of Nations Doc. No. C.233.137, at 6-7 (May 15, 1937).

INTEGRATED BASIN DEVELOPMENT PLAN OF THE JORDAN RIVER SYSTEM

which are located in Syria and form the boundary between Syria and Jordan up to the Yarmuk's confluence with the Jordan River, about 7 kilometers south of the Sea of Galilee; this is one of the most important sources of the Jordan River and contributes 40 percent of the total with a flow of 475 MCM/yr.; and (b) the Zerka or Jajbok, wholly located in the territory of Jordan.

The minor tributaries on the western bank of the Jordan River are the Jalud, coming from the plain of Ezdraelon to the surroundings of Beisan, and the Fara from Nablus. Various salt springs rise in the lower valley; the remaining tributaries are seasonal wadis.

Various plans have been prepared to develop the water resources of the Jordan River basin. The acceptability, partial or total, and the actual development of these plans, have depended upon political events. Specifically, much of today's water crisis concerning the Jordan can be traced to actions taken during the time of the British Mandate. The plans are described briefly below.¹⁸

The Balfour Declaration of 1917 is the first document through which the British government pledged its support for the "establishment in Palestine of a national home for the Jewish people," with the explicit provision that "nothing shall be done which may prejudice the civil and religious rights of existing non-Jewish communities." The British White Books were the first plans to be prepared and included reports by the Anglo-American Committee (1926-28) and the British Committee.¹⁹

In 1926, the British High Commissioner granted a 70-year concession to Pinhas Rutenberg of the Palestine Electricity Corporation to utilize the water of the Jordan and Yarmuk Rivers. This effectively denied the Arabs the right to use this water without permission of the Corporation (permission was never granted).²⁰

In 1937, Great Britain requested that M. Ionides, Director of Development for the Transjordan government, prepare a study of the water resources and irrigation potential of the Jordan River basin.²¹ This study was to serve later as a reference for the United Nations plan for the partition of Palestine. According to this plan, the Yarmuk flood waters were to have been stored in Lake Tiberias. A portion of the Yarmuk River water, together with the water stored in Lake Tiberias, was to have been diverted through the East Ghor Canal to irrigate 75 thousand acres of land. Finally, the irrigation water of the Jordan River sys-

18. For a brief review of these plans, see L. Hosh & J. Isaac, *Roots of the Water Conflict in the Middle East*, address Before the Middle East Water Crisis Conference, Univ. of Waterloo (Can.) (May 7-9, 1992).

19. Mandate for Palestine of July 24, 1922, U.N. Doc. A/70 (1922), approved by the League of Nations.

20. Hosh & Isaac, *supra* note 17, at 3.

tem was to have been used primarily within the Jordan River basin. This plan did not succeed due to the opposition of the Zionists.

In 1943, Walter Clay Lowdermilk published a book called *Palestine, Land of Promise*, in which he states that full utilization of the Jordan would provide sufficient water for the settlement of 4 million Jews, in addition to the 1.8 million Arabs who were in Palestine at the time.²² The main themes of this book are the diversion of the upper sources of the Jordan and the Litani Rivers in Lebanon to the Negev in south Palestine, and the maintenance of the water level in the Dead Sea with water from the Mediterranean, taking advantage of the difference in levels and, at the same time, generating electricity along the way. This project was to be solely controlled by the Jews, who enthusiastically endorsed it.

The Jewish Agency then asked an American engineer, James B. Hays, to investigate the technical and economic aspects of the project. The Hays plan proposed to divert half of the Yarmuk water into Lake Tiberias to replace the water which was to be diverted from the Jordan River upstream, as proposed in the Lowdermilk plan. To implement this plan, the Israeli government, after the 1948 War, formulated a seven-year plan, approved in 1953, to utilize the area's water resources; thus began construction of the National Water Carrier. This project included the diversion of water from the Jordan River to the Negev Desert, and the establishment of a comprehensive network to provide water to all parts of Israel, in spite of the fact that the transfer of water from one basin or aquifer to another had been expressly prohibited by Jordanian water legislation in force before the Israeli occupation.²³ Note also that, during the 1948 War, the Rutenberg electricity generating plant was destroyed by Israel to avoid exclusive control of the Jordan and Yarmuk waters by the Arabs.

In order to develop irrigation for the Palestinian refugees, in 1949 the Jordanian government, together with the United Nations Relief and Works Agency (UNRWA), commissioned the firm of Sir Murdoch MacDonald to prepare a scheme as a complement to the Ionides plan. Finalized in 1951, this plan proposed that the Jordan's water be utilized for irrigation along both banks, and that Lake Tiberias be utilized as a storage reservoir for the Yarmuk River water. The Arabs were unhappy with the idea of utilizing Lake Tiberias for storage.

In 1952, M.A. Bunger, an American engineer working for the Point 4 program in Jordan, proposed another plan which was favored

21. M. Ionides, *The Water Resources of Transjordan and Their Development* 8 (1939).

22. W. Lowdermilk, *Palestine, Land of Promise* 169 (1944).

23. Law of 1959, art. 60 reprinted in D. Caponera, *Water Policies, Legislation and Practices in Israeli Occupied Palestinian and Other Arab Territories* (Report to the United Nations in Pursuance of General Assembly Resolution 38/144 of Dec. 14, 1983) GA ECOSOC A/38/282-E/1983/84 (June 23, 1984).

by the Arabs.²⁴ It included the construction of a dam to serve as a water storage reservoir along the Yarmuk River at the junction of three valleys in the Maqarin area. Another dam at Addassiyah and a series of canals would irrigate the East Ghor area. Additionally, two hydro-electric plants at the sites of the two dams would be included for the purpose of supplying electricity and water to both Jordan and Syria. The Israelis disapproved of the plan, claiming that the 1926 concession to Rutenberg had been a grant of exclusive rights to the Yarmuk water. They convinced the United States government and UNRWA to withdraw their support, and the plan was abandoned.

A special envoy of President Eisenhower, Eric Johnston, proposed another plan in 1953. This plan was essentially a combination of the Lowdermilk-Hays and MacDonald-Bunger plans.²⁵ It was based on the philosophy of the Tennessee Valley Authority (TVA), i.e., taking water where it is available and bringing it to where it is needed, irrespective of political boundaries. This plan satisfied neither the Israelis nor the Arabs. It was rejected by the Arab states for a number of reasons, including that it was formulated without any consideration of the political boundaries of the basin states, and that Lebanon would benefit little from the project in spite of having land to develop in the basin. In addition, most of the Jordan water would be stored in Lake Tiberias inside Israel; 33 percent of the total flow would go to Israel and 67 percent would go to the Arab states. The use of Lake Tiberias as a storage reservoir was not considered sound, because heavy evaporation would occur. Finally, the acceptance of the project would have implied indirect cooperation with Israel, which was not recognized as a state by the Arabs. A modified form of the Johnston plan was subsequently used by the United States as the basis for negotiation.

In response to the Johnston proposal, an Arab project for the utilization of the Jordan's water was presented in March 1954.²⁶ The project was based on the principle that it is not possible to plan a project for the utilization of the Jordan River water without considering the political boundaries. On these grounds, it allocated 20 percent of the utilizable water to the occupied area and 80 percent to the Arab countries. The Yarmuk water would not be stored in Lake Tiberias, and the total area which would be developed would amount to about 880,000 dunums (one acre is equivalent to four dunums), of which 235,000 dunums, or 26 percent, was for the occupied area. The power produced under this scheme would be about 20 percent for the occupied area and 80 percent for the Arab countries.

24. 1 Palestinian Encyclopedia Comm., *MacDonald and Bunger Plans*, in *Encyclopedia of Palestine* 153 (1984).

25. Hosh & Isaac, *supra* note 17, at 5-6.

26. M. Brecker, *Decisions in Israel's Foreign Ministry* 204 (1975).

The Israelis revived the National Water Carrier project under the Ten Year Plan in 1958. The plan included a proposal to divert the Jordan's water north of Lake Tiberias to the Negev Desert (outside the catchment area).²⁷ The total amount of water to be used was 478 MCM/yr. The plan involved the construction of an open canal up to Banhouf storage lake, and from there for about 77 kilometers to Tel Aviv, then south of Tel Aviv with a division into two lines, with pumping stations and different structures that also would catch the salty springs. Action taken under the Ten Year Plan carefully conformed to the water allocation provided for Israel in the revised Johnston plan.

As a reaction to Israel's National Water Carrier, at a summit conference of Arab States in 1964, steps were taken to build dams in order to utilize water from the Wazzani, Hasbani, and Banyas Rivers for irrigation in Lebanon, Syria, and Jordan, after conveying the water to the Jordan valley through the East Ghor Canal. Israel considered this an aggressive action that threatened its water resources and destroyed its work sites. The subsequent Israeli occupation of the Golan Heights in 1967 put an end to Arab utilization of the waters of the Jordan basin.²⁸ In 1969, the East Ghor Canal in Jordan also was bombed by the Israelis, but after secret negotiations between Jordan and Israel, the structures were rebuilt.

In 1967, Israel occupied the West Bank, the Gaza Strip, and the Golan Heights, thus expanding its control over the water sources, including underground aquifers. In 1982, with the Israeli occupation of South Lebanon, this control was extended to include a part of the Litani River. It has been the consistent policy of Israel to derive maximum benefit from the available water without increasing the portion of water allotted to the Arab population.²⁹ No plan appears to have been developed among the basin states concerning the use of groundwater resources, although it is said that some renewable groundwater is being overexploited, even beyond safe yield.³⁰

It would be impossible in this brief survey to catalogue all of the works in existence in the Jordan River basin. Described below, however, are the major water use schemes which seem to have been developed.

In Israel, the Lake Huleh drainage and irrigation scheme has drained and reclaimed all the swampland north of the lake and in the area of the lake itself. The Tiberias-Beisan scheme utilizes the water of

27. Hosh & Isaac, *supra* note 17, at 7.

28. *Id.*

29. See Caponera, *supra* note 23.

30. M. Bilbeisi, *Jordan's Water Resources and the Expected Domestic Demand by the Years 2000 and 2010: Detailed According to Area*, in *Jordan's Water Resources and Their Future Potential*, Proceedings of the Symposium, Oct. 27-28, 1991, Water Research and Study Centre, Univ. of Jordan (1992).

Lake Tiberias for irrigating west Galilee, and the Jordan-Negev scheme transports the upper Jordan waters into the Negev region.

The Dead Sea catchment area plan provided for drainage of all water from the intermittent wadis around this sea, and for utilization of the water for irrigation in the Negev. Israel intended to substitute this water with sea water brought in from the Mediterranean. In 1981, Israel planned a canal through the occupied Gaza Strip to link the Mediterranean and Dead Seas. This 100 kilometer canal, to start at Qatif, would have utilized the drop in altitude between the two Seas to generate electric power. It was strongly opposed by the world community on environmental grounds.

Mention should be made of fishing on Lake Tiberias, which fishing has been the cause of dispute with the Syrians. Also problematic is the ongoing exploitation of chemicals (potash and asphalt) in the Dead Sea—the Dead Sea chemical industry requires that the water in the lake be maintained at a more or less constant level.

Since 1985, a project to pump underground water to the Jewish settlements has been under consideration in Israel. It contemplates the withdrawal of water near Herodion; three-fourths of this water would find its way to the West Bank.

In Jordan, the Jordan Valley scheme utilizes the water of the Yarmuk River for irrigation through the East Ghor Canal. This project diverts the normal flow of the Yarmuk into a 69-kilometer-long main canal which, combined with the perennial flow of side wadis, feeds an irrigation and distribution system of about 120,000 dunums. Ultimately, the aim is to irrigate over half a million dunums and generate approximately 50,000 kilowatts of electric power.

In Lebanon, the Johnston plan contemplated the construction of a dam on the Hasbani, a tributary of the Jordan River, with a network of canals for irrigation and power production. Syria utilizes the water of the Yarmuk River, the Jordan River's largest tributary, for irrigation in the Mezerib district before the Yarmuk becomes a boundary stream between Syria and Jordan.

Mention has to be made of the groundwater problem in the Jordan basin. Most of the groundwater flows from the Occupied Territories to Israel; this situation must be taken into consideration in any future political and legal settlement.

To summarize, it would appear that in spite of the lack of formal agreements concerning the use of the Jordan water and of the groundwater located in the West Bank and flowing into Israel, the coriparians have been carrying out water utilization projects and schemes on the basis of a tacit agreement. It is worth noting, however, that the Jordan River and the underground water are considered by the Arab

League as "Arab waters," and as such the League does not recognize the rights of Israel to them.

LEGAL ASPECTS

Determining the legal rights to the Jordan River is one of the major problems still outstanding in the Middle East. The existing agreements concerning the Jordan River system are outlined below:

1. Convention between France and the U.K. for the territories under their mandates, signed in Paris on December 23, 1920.³¹ This general boundary convention provides that experts nominated by the administrations of Syria and Palestine study the question of the use of the waters of the upper Jordan and Yarmuk Rivers and their tributaries for irrigation and hydropower generation. In this connection, two principles are put forth: the first establishes "the needs of the territories under the French Mandate"³² (in part upper riparian and in part contiguous) as receiving prior satisfaction. The second specifies that the French Government is to give its representative "the most liberal instruction for the employment of the surplus of these waters for the benefit of Palestine."³³

2. Agreement of February 3, 1922, signed by the U.K. and France, defining the borders of Palestine, Lebanon, Syria, and Transjordan along the Jordan River and along the waters of Lakes Tiberias and Huleh.³⁴ Pursuant to this agreement, the border runs 50 to 150 meters outside of the River and Lake Tiberias, and thus includes both the River and the Lake inside Palestinian territory.

3. Mandate for Palestine and Memorandum by the British Government relating to its application to Transjordan, as approved by the Council of the League of Nations on July 24, 1922.³⁵ This agreement provides for freedom of transit under equitable conditions across the territories.³⁶

4. Mandate for Syria and Lebanon, granted to France by the Council of the League of Nations, July 24, 1922.³⁷ This agreement, like the mandate for Palestine and memorandum by the British government, also provides for freedom of transit.³⁸

31. 22 L.N.T.S. 355 (1920).

32. Convention between France and the United Kingdom for the Territories under their Mandate, art. 8, Dec. 23, 1920, 22 L.N.T.S. 355 (1920).

33. *Id.*

34. 117 B.F.S.P. 293 (1922).

35. Mandate for Palestine, *supra* note 19.

36. *Id.* art. 18.

37. Mandate for Palestine, *supra* note 19.

38. *Id.* art. 11.

5. Exchange of notes between France and the U.K. of March 7, 1923.³⁹ This agreement grants the government of Palestine or any person authorized by the Palestinian government, "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."⁴⁰ It further provides for the settlement of disputes by a commission composed of representatives of the two mandatory powers; recognizes the existing rights of Syrian nationals to the use of the Jordan's water, and accords equal fishing rights in the lakes, as well as in the river, to Syrian, Lebanese, and Palestinian nationals, although reserving the policing of the lakes only to the Palestinian government.

6. Convention (multilateral) relating to the development of hydraulic power affecting more than one state, December 9, 1923.⁴¹ It appears that, although signed by both France and the U.K. (on behalf of the territories under their mandates), this convention was ratified only by the U.K. The convention provides that a state wishing to undertake a project for the development of hydraulic power of interest to another state, or involving alterations of such territory, is to enter into negotiations with this state and attempt to reach an agreement.⁴² It is to be noted that, according to the theory of state succession in international law, the provisions of this convention are binding on successor states. Israel has acceded to the convention.

7. Agreement of good neighborly relations, signed by France and the U.K. on behalf of Syria and Lebanon, and Palestine, respectively, on February 2, 1926.⁴³ This Agreement stipulates that "all the inhabitants, whether settled or semi-nomadic, 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 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 rules shall apply to village rights over communal properties."⁴⁴

8. Protocol between France and the U.K., signed on October 21, 1931, concerning the Jordan River and the wadis Zeyzum and Meiden. This protocol reaffirms the principles contained in the convention of December 23, 1920.

39. 22 L.N.T.S. 364 (1922).

40. *Id.*

41. 36 L.N.T.S. 75 (1923).

42. *Id.* art. 3.

43. 56 L.N.T.S. 79 (1926), amending 121 B.F.S.P. 953 (1923).

44. *Id.* art. 3.

9. Armistice Agreement between Israel and Jordan, signed on April 3, 1949.⁴⁵ Under the Mandate for Palestine, the Dead Sea formed part of Palestine proper. Under the Plan of Partition of 1947 and this agreement, the Dead Sea is divided along a line which leaves only the western part of the southern half to Israel, and all the rest to Jordan. Note that no agreements seem to exist concerning the wadis surrounding the Dead Sea.

10. General Armistice Agreement between Israel and Syria, signed on July 20, 1949.⁴⁶

11. Agreement between Jordan and Syria concerning the utilization of the Yarmuk water, signed June 4, 1953.⁴⁷ This agreement deals with cooperation in the execution of the so-called "Yarmuk Scheme," i.e., the Maqarin Dam and a series of installations, to provide electric power and irrigation water. Under Article 8,

a) Syria shall retain the right to the use of the waters of all springs welling up within its territory in the basin of the Yarmuk and its tributaries, with the exception of the waters welling up above the dam below the 250 m level, and shall retain the right to use water from the river and its tributaries below the dam for the irrigation of Syrian land in the lower Yarmuk basin and eastward of Lake Tiberias for other Syrian schemes.

b) Jordan shall have the right to use the overflow from the reservoir and joint generating station at Maqarin... the irrigation of the Jordanian lands and other Jordanian schemes; it shall similarly have the right to use water superfluous to Syrian needs⁴⁸

Other articles provide for the cost of studies, construction, operation, and maintenance and, in Article 10, for a Joint Syro-Jordanian commission for the supervision of the project.⁴⁹ The Yarmuk project interfered directly with proposed Israeli plans to carry water from the Jordan River to the Negev Desert. Until recently, political developments in the region have made this project unfeasible.

12. Agreement of June 1977, between Jordan and Syria, concerning the construction of the Maqarin Dam.⁵⁰

13. Project loan agreement relating to the Maqarin Dam and Jordan Valley irrigation system design, signed by Jordan and the United States, September 21, 1977.⁵¹ On the grounds that the construction of

45. Armistice Agreement, Apr. 3, 1949, Isr.-Jordan, 42 U.N.T.S. 303.

46. General Armistice Agreement, July 20, 1949, Isr.-Syria, 42 U.N.T.S. 32.

47. Reprinted in ST/LEG/SER.B/12, at 378 (1953).

48. *Id.* art. 8.

49. See *id.* art. 10.

50. 21 Middle East Econ. Digest 39 (1977).

51. 17 I.L.M. 788 (1978); T.I.A.S. No. 9311 (1977).

the Unity Dam at Mukheiba and the other hydro-electric dams and diversion works planned by Syria and Jordan would reduce the quantity and quality of the Yarmuk water utilized by Israel, the Israelis originally were not in favor of the project. Nonetheless, the Jordanians, and, indirectly, the Syrians, have been secretly negotiating with Israel, with the assistance of the United States, concerning a share of the Yarmuk in return for Israel withdrawing its opposition to the construction of the Unity Dam.⁵²

14. An informal agreement for a de facto division of the Jordan and Yarmuk Rivers was reached between Jordan and Israel, with financial aid from the United States following the Johnston plan. However, Jordan claims that Israel and Syria are using more water than is allotted to them.⁵³

Declaration of Principles signed between Israel and the PLC, 13 September, 1993

The Position of the Co-Riparian States

The particular legal situation prevailing in the Middle East renders international cooperation difficult. For example, Jordan and Syria maintain claims against the hydraulic works carried on by Israel; the latter does the same with respect to Jordan and Syria.

The majority of the Arab countries do not recognize Israel as yet, therefore, consider themselves as not bound by any previous agreements.⁵⁴ Specifically, the Jordan River is considered by the Arab League as an "Arab river." The Arab states thus do not recognize the rights of Israel to this water.⁵⁵ An informal agreement for a de facto division of the Jordan and Yarmuk Rivers was reached between Jordan and Israel, with financial aid from the United States, under the Johnston plan. However, Jordan claims that Israel is using more water than is allotted to it.⁵⁶ The Palestinians also claim that the groundwater of the West Bank, currently being overpumped by Israel, should be allocated for Palestinian use.⁵⁷

The Arabs see the Israeli move to block the Unity Dam at Mukheiba on the Yarmuk River as a serious threat to Jordanian and

52. H. Shuval, *Approaches to Solving Water Resources Conflicts in Arid Areas - Israel and her Neighbours as a Case Study*, in *Legal Issues in Water Resources Allocation, Wastewater Use and Water Supply Management* (World Health Organization ed., 1991).

53. F. Pearce, *Wells of Conflict on the West Bank*, New Scientist (June 1991); D. Nordell, *The Wet War*, Scopus-Jour of the Hebrew Univ. of Jerusalem (1991).

54. S. Rosenne, *Israel's Armistice Agreements with the Arab States* 47 (1951); see also 42 U.N.T.S. 251-351 (1952).

55. Shuval, *supra* note 52.

56. Pearce, *supra* note 53.

57. Global Viewpoints Forum, *Water Resources: Israeli and Palestinian Concerns* (1990) (unpublished manuscript, prepared in connection with the Israeli-Palestine Center for Research and Information, Jerusalem).

Syrian development. The Jordanians and, indirectly, the Syrians, have been secretly negotiating with Israel, with the assistance of the United States, concerning a share of the Yarmuk in return for Israel withdrawing its opposition to the construction of Unity Dam.⁵⁸

Israel is polluting the lower reaches of the Jordan River with agricultural and industrial waste. The Arabs are concerned about this, as well as existing and additional Israeli immigration settlements which would use more water from the Jordan/Yarmuk water system and the mountain aquifer. The Arabs fear that, in the case of a peace settlement, the agreed upon division of the very limited shared water resources would leave them with an insufficient amount of water.⁵⁹ According to one United Nations report, Israel has effectively frozen Palestinian water utilization in the Occupied Territories and has allocated insufficient amounts of water to the Arabs.⁶⁰ The Israeli overpumping of the groundwater around the Gaza Strip also has reduced the water level and caused sea water intrusions.⁶¹

Regarding the possibility that water may be supplied by sources outside the Jordan basin (via the Turkish Peace Pipeline, for example), the Arabs fear that the water supply lines may be used for political ends.⁶² On the other hand, the Arabs would like to see Israel use this additional water, as this would limit Israel's claim to Arab water sources.

Regarding the Israeli position, Israel opposes the hydraulic works in Syria as a case of water rights aggression which could be repeated in the future. With the Israeli occupation of the Banyas and Hasbani Springs on the Golan Heights in 1967, this threat has been reduced. In addition, the Israelis claim that there is a danger of pollution of the Jordan River/Sea of Galilee/Yarmuk River because of improper environmental management in Syrian, Lebanese and Jordanian territories. Israelis also assert that the construction of the Unity Dam at Mukheiba and other planned hydro-electric dams and diversion works by Syria and Jordan would reduce the quantity and quality of the Yarmuk water presently utilized by Israel.

Israel further believes that, with autonomy and independence the Palestinians might insist on their claim that all the water of the shared Yaqon Tannanim aquifer beneath the West Bank be allocated exclusively for Palestinian use. If the groundwater of the West Bank should fall into the hands of the Palestinians, there is a danger, from

58. Shuval, *supra* note 52, at 41.

59. *Id.* at 34.

60. Caponera, *supra* note 23.

61. Global Viewpoints Forum, *supra* note 57.

62. One of these projects, the "Peace Pipeline Project," initiated by Turkey in 1988, plans to take water from the Ceyhan River in Turkey and sell it to the Gulf States (via the Eastern Pipeline) and Israel (via the Western Pipeline). It is already in the final planning stage; however, some Arab States are concerned and reluctant to cooperate.

the Israeli perspective, of pollution and a further lowering of the Yaqon Tannanim aquifer due to overpumping and intrusion of sea water.

The Israelis further believe that Jordanian opposition to the construction of the important Israel Mediterranean/Dead Sea canal project would jeopardize the project. Finally, the Arab calls for abatement of immigration to Israel, so as not to increase the burden on the limited water resources in the area, are seen as an unacceptable interference in Israel's internal affairs.⁶³

It is obvious that the water resources of this area are insufficient to fulfill the needs of the riparian countries, and it is hard to see how negotiations concentrating on past plans would bring the opposing parties any nearer to accommodation. One solution would be to make available waters from countries outside the basin: Turkey, Lebanon, and Egypt. For this purpose, a regional Water-for-Peace Plan is being envisaged. This plan would provide for the following projects: (a) construction of a pipeline from the Nile River through El Arish to the Gaza area and the Negev Desert;⁶⁴ Proper compensation would be paid to Egypt; (b) development a project to supply water from the Litani River in Lebanon to Israel, the West Bank, and Jordan on a commercial basis, with Lebanon receiving compensation;⁶⁵ and (c) construction of a pipeline from Turkey through Syria and Jordan and the West Bank; this has been described as the Turkish Peace Pipeline.⁶⁶

As part of this project, the Sea of Galilee or the Unity Dam could be utilized as reservoirs to supply water to Jordan and the West Bank. To avoid crossing boundaries, an alternative would be to carry water to south Cyprus and from there to the coast of Israel. Turkey also has substantial reserves of water resources for present and future needs which it intends to market, perhaps for a project such as this. However, the partners to the dispute must be assured that each will have direct access from within their territories to an equitable and reasonable share of the water resources.

Sea water desalinization plants could provide water to fulfill the unmet needs. The desalinization option envisages the construction of multinational plants on the coastline between Israel and Gaza and on the border between Israel and Jordan at Aqaba and Elat, and possibly at other sites. The Gaza plant could supply water to Israel, Gaza, and the West Bank, and could provide an alternative solution if the above-mentioned pipeline projects prove to be too complex.⁶⁷

63. See Shuval, *supra* note 52, at 30-31.

64. E. Kally, *A Middle East Water Plan Under Peace*, the Armond Hammer Fund for Economic Cooperation in the Middle East, Tel Aviv University (1986).

65. *Id.*

66. J. Kollars, *The Course of the Water in the Arab Middle East*, 33 *American-Arab Affairs* (Summer 1990). See also Report of the Turkish Ministry of Foreign Affairs, *The Peace Pipeline Project* (1990).

67. Shuval, *supra* note 52.

CONCLUSION

Any agreement on water allocation and distribution in the Middle East area would presuppose joint control in the management of the water. In addition, any negotiation should give serious consideration to the principles of the Helsinki Rules, which call for the equitable apportionment and eventual joint monitoring, inspection, and control of the water resources.⁶⁸

It is envisaged that there will be arrangements for joint management and operation of water import facilities and desalinization plants, including control of environmental pollution. This could be achieved through the creation of a regional water authority in which all the basin states would participate: Israel, Palestine, Jordan, Syria, Lebanon, and perhaps Turkey and Egypt. This authority could be governed by a council of ministers or a technical commission with a secretariat to carry out its decisions. The basic rights of all parties concerned to an equitable and reasonable use of the water and a fair portion of the shared Jordan/Yarmuk system and groundwater aquifers thus could be clearly established.

The existing agreements concerning the use of the Jordan basin are inadequate for regulating use of the water by the various co-riparians.⁶⁹ While the validity of these agreements ought to be affirmed, their provisions no longer reflect the existing situation. New rights to water have been established and cannot be denied. Nevertheless, prior rights must be respected. Any one country's utilization or mismanagement, including pollution, of the water in any part of the watershed of the Jordan River system causes international problems.

No legal settlement of the international water rights will be possible until there is a clear demarcation of the boundaries between Israel, Lebanon, Syria, and Jordan; the temporary armistice agreements do not constitute a defined boundary settlement. This proposition notwithstanding, resolution of the political problems in the area certainly can be facilitated if a decision on the joint management and allocation of the water of the Jordan River basin is reached among the co-riparians.⁷⁰

68. See Helsinki Rules on the Uses of the Waters of International Rivers, adopted by the International Law Ass'n at the 52nd Conference (Aug. 20, 1966). Also, A. Fahmi, *International River Law for Non-Navigable Rivers with Special References to the Nile*, in *Rev. Egyptienne De Droit Int'l.*, Vol. 23, 1967.

69. Hosh & Isaac, *supra* note 18, at 8.

70. For a more detailed legal analysis concerning the Jordan River basin, see D. Caponera, *Legal - Institutional Issues Involved in the Solution of Water Conflicts in the Middle East: The Jordan*, address before the First Israeli Palestinian International Academic Conference on Water, Zurich (Dec. 1992).

THE NILE RIVER BASIN

The word "Nile" defines the watercourse, 6,695 kilometers long, which reaches from Equatorial Africa to the Mediterranean Sea. Various watercourses having different origins and names are tributaries of the Nile River. From its source to Lake Victoria at Jinja, about 800 kilometers, the river is called "Kagera." Coming from Lake Victoria at Jinja, the river flows 400 kilometers before entering Lake Mobutu Sese Seko (Lake Albert) in Uganda under the name "Victoria-Nile." From Lake Albert, it takes the name "Albert-Nile" until the town of Mongalla in Sudan, after which it is called "Bahr-el-Gebel" (Mountain River) up to the town of Malakal. In this last part of its course, it receives three important tributaries: the Bahr-el-Ghazal (Gazelle River from Sudan), the Bahr-el-Zeraf (Giraffe River from Sudan) and the Sobat (coming from Ethiopia). The latter is formed by other tributaries: the Baro, the Gila, the Akobo (from Ethiopia), and the Kangan (from Sudan).

From the town of Malakal to Khartoum, the Nile River is called the "White Nile" (Bahr-el-Abiad). At Khartoum, the White Nile meets the Blue Nile (Bahr-el-Azrak), coming from Lake Tana in Ethiopia. From that point to the Mediterranean Sea, it is called Nile and receives only one other large tributary, the Atbara, from Ethiopia. Upon reaching Khartoum, the water of the White Nile is clear and limpid, while the Blue Nile, the Sobat and the Atbara, draining the high plateau of Ethiopia, carry the fertilizing lime which in the past has been so helpful to Sudan and to Egypt.

The whole catchment area of the Nile River basin is about 2.9 million square kilometers, representing nearly one-tenth of all African territory. The average yearly flow, calculated from data available from the last fifty years, fluctuates between 40 and 140 billion cubic meters (BCM) of water per day, with an annual average of 90 BCM.⁷¹

Hydrographically, the Nile River basin may be divided into three distinct major sub-basins: the White Nile, the Blue Nile and the Atbara. The countries of Burundi, Egypt, Ethiopia, Kenya, Rwanda, Sudan, Tanzania, Uganda, and Zaire share these basins.

According to official Egyptian estimates, the contribution in total water flow can be summarized as follows: the White Nile, coming from the great lakes of Central Africa (Kagera, Lake Victoria, Victoria-Nile, Lake Mobutu Sese Seko, Albert-Nile, Bahr-el-Ghazal, Bahr-el-Zeraf, White Nile), provides two-sevenths of the water; and the Blue Nile and the Atbara, coming from Ethiopia, provide about five-sevenths.⁷² Ethiopian sources, in contrast, claim that the White Nile sub-basin represents only one-seventh of the total flow, and that

71. Egyptian Ministry of Public Works, *A Short Account of the Nile Basin* 2 (1944).

72. *Id.* at 2.

the Ethiopian contribution through the Blue Nile, Sobat, and Atbara sub-basins provides the remaining six-sevenths of the total flow.⁷³ This issue, together with other factors, has caused Ethiopia to oppose any form of cooperation with Egypt until recently.

The first hydraulic work to be undertaken on the Nile was the Delta Barrage. This was built in Egypt during the 19th Century to raise the level of the water during the low period, but only the natural flow was utilized through it.⁷⁴

By 1886, the area under perennial irrigation in Egypt was about three million acres; this consumed the entire natural outflow of the river during the low period. The remaining area, yielding only one crop under basin irrigation, was two million acres at that time. The irrigated area in Sudan was negligible. Egypt claims an historical water right from this period, which right is not disputed by Sudan.⁷⁵

The Aswan Dam was built between 1898-1902 in order to provide one BCM of stored water. It was followed by the strengthening of the Delta Barrage and by the building of other barrages at Assiut in 1902, and at Esna in 1908, with the intent to raise the river level and thus provide command to other canals. The Aswan Dam was then heightened between 1907 and 1912 to increase its capacity up to 2.5 BCM.⁷⁶

In 1920, the area under perennial irrigation in Egypt was four million acres, while the area under basin irrigation was 1.6 million acres. The total yearly requirements for Egypt at that time were 30 BCM at Aswan, or 50 BCM at Khartoum.⁷⁷

The rapid population growth in Egypt and the need for more irrigation water brought about the construction of the Nag-Hammadi Barrage in 1930, a second heightening of the Aswan Dam in 1933, the strengthening of the Assiut Dam in 1938, the construction of the new Delta Barrage in 1940, the strengthening of the Esna Barrage in 1947, and erection of the Edfina Barrage in 1951.⁷⁸

In 1948, French engineer Adrien Daninos put forth his ideas concerning "the integral utilization of the Nile waters"⁷⁹ and proposed the construction of a huge barrage-reservoir south of Aswan at a location called Sadd-el-Aali, with a possible capacity of 165 BCM of water per year.⁸⁰

73. D. Caponera, *Il Bacino Internazionale del Nilo, Considerazioni Giuridiche*, in XIV La Comunità Internazionale 48 (1959).

74. E. El-Hinnawi, *The State of the Nile Environment: An Overview*, in 4 Water Supply and Management 1-11 (1980).

75. Sudan Ministry of Irrigation and Hydroelectric Energy, *The Nile Water Question: the Case for the Sudan, the Case for Egypt and the Sudan's Reply* 12 (1955).

76. I - VII Hurst et al., *The Nile Basin* (1946).

77. Caponera, *supra* note 73, at 49.

78. *Id.*

79. A. Daninos, *L'utilisation integrale des eaux du bassin du Nil* (1948).

80. *Id.*

Since 1948, a nationalist theory has prevailed in Egypt, according to which all important works on the Nile should be constructed in Egyptian territory in order to avoid the danger of any works built outside of the country being used as a political weapon against Egypt. Accordingly, in July 1955, the Egyptian Government undertook the study and construction of the Sadd-el-Aali Dam (also improperly called "Aswan Dam" or "High Dam"). The completed Dam is 4.5 kilometers long and creates a reservoir, Lake Nasser, containing more than 100 million acre-feet of water.⁸¹

This Dam has had favorable and unfavorable consequences. It has caused a revolution in the Egyptian irrigation system. Practically all of the fertile silt from Ethiopia is deposited in Lake Nasser. While this is a disadvantage, the extra water in storage has brought about, together with water security, a change from flood to perennial irrigation and an increase in the irrigated area, which is farmed with the use of fertilizers. In addition, the Dam provides hydro-electric power and flood control. Furthermore, during the extended drought of the 1980s, the Sadd-el-Aali Dam enabled Egypt to cope with the situation and even increase its agricultural production, while Ethiopia and Sudan suffered severe famines. However, this was also because Sudan did not take its full share of the water allocated under the 1959 Nile Water Agreement, and Ethiopia did not withdraw any water from the Blue Nile sub-basin.

In 1925, the Sennar Dam was built on the Blue Nile in Sudan to provide water for the Gezira scheme by raising the water level during the time of high water and storing it for use in the season of low water. Further upstream, near the Ethiopian border, are the Roseires Dam and Reservoir. Completed in 1966, the dam's primary purposes are to increase storage of the Blue Nile and provide hydropower. The reservoir is 80 kilometers long with a maximum depth of about 50 meters.⁸²

On the White Nile in Sudan, the Jebel Aulia Dam was completed in 1937 to hold back part of the White Nile while the Blue Nile is in flood. However, since the valley above Jebel Aulia is very flat and open (at maximum capacity, the reservoir behind this Dam extends 480 kilometers upstream), a great deal of water is lost by evaporation and seepage.⁸³

81. Egyptian Gov't, *The Sadd el Aali Project* (1955).

82. Roseires Dam, Nat'l Comm., *International Commission on Large Dams* 6, 17-18 (1963).

83. El-Hinnawi, *supra* note 74, at 3; *see also* World Meteorological Organization, *Proceedings of the International Conference on Water Resources and the Environment in Sudan* 6 (Jan. 1992).

In Ethiopia, there are plans to utilize the water of the Blue Nile. An example is the Tana Beles irrigation project, which is to divert the water of Lake Tana into the valley of the Beles.⁸⁴

The Owen Falls Dam in Uganda, completed in 1954, is the first control work on the upper White Nile. Production of hydro-electric power is its primary function, but it also controls the outflow of Lake Victoria, which is thereby converted into the largest reservoir in the world.⁸⁵

Above Malakal in the Sudd region there are extensive swamps which cause a significant loss of water for the downstream Nile. It is estimated that 42 BCM of water are lost annually in the Sudd. Of these, 14 BCM are lost in the Bahr-el-Jebel, six BCM in the Bahr-el-Zeraf, eight BCM in the Sobat Machar Marshes, and 14 BCM in the Bahr-el-Ghazal.⁸⁶ A diversion canal, the Jonglei Canal, is being constructed to divert the water from Bahr-el-Jebel to the White Nile, south of Malakal, away from the swamp region. It has been said that the Jonglei Canal would lead to serious environmental consequences, but recent studies show that these may be minimal.⁸⁷

The measures planned in the Sobat Machar Marshes also include storage reservoirs on the Baro River and a diversion canal from Machar through Adar to the White Nile (the net yield from the Sobat Machar Marshes is up to four BCM). In the Bahr-el-Ghazal, the measures include the construction of storage reservoirs on the tributaries and diversion canals to Bahr-el-Jebel and to the White Nile, all expected to yield an additional quantity of seven BCM.⁸⁸ Political instability has delayed the finalization of this project.

Further to the south there are swamps in the Lake Victoria sub-basin, and the countries concerned, Kenya and Uganda, attach considerable importance to their reclamation. Examples are the Yala Swamp reclamation on the Lake Victoria shore in Kenya, and the efforts made in Uganda to grow rice in reclaimed swamps by combining the techniques of drainage, swamp reclamation, and irrigation. Other projects relate to the utilization of the waters of the tributaries flowing into Lake Victoria in Kenya.

84. Other project ideas have been developed. See, e.g., Z. Abate, *Scope of Monitoring, Forecasting and Simulation of River Basins for Agricultural Production within the Context of an Integrated Nile Basin Development*, presented at the Workshop of Monitoring and Forecasting of River Basins for Agricultural Production, p. II, 25-37, IDEA and FAO, Bologna (Mar. 18-23, 1991).

85. El-Hinnawi, *supra* note 74. For details, see C. Okidi, *Legal and Policy Regime of Lake Victoria and the Nile Basins*, 20 *Indian J. Int'l L.* 424-27 (1980).

86. P. Beaumont, *Transboundary Water Disputes in the Middle East: The Nile* 3 (1992).

87. *Id.*

88. El-Hinnawi, *supra* note 74, at 8.

Within the context of Nile basin development, a regional effort has been made to coordinate studies among neighboring countries. Since 1967, the Nile basin countries have been engaged in a joint project, HYDROMET, now TECCONILE, to conduct hydrometeorological surveys of lakes Victoria, Kyoga, and Mobutu Sese Seko. This project has resulted in a wealth of data on, for example, the levels of water in the lakes; surface and subsurface inflow; rainfall; evaporation from the lakes; and the effects of these on fisheries, navigation, and health conditions.⁸⁹ A water quality and environmental impact model of the Upper Nile basin has recently been created. However, the cooperating co-basin states do not include Ethiopia, and the project refers only to the water of the White Nile.

Ethiopia and other upper riparian countries have not substantially utilized the Nile water for irrigation purposes in their territories yet, but they intend to reserve a share of the water for their own future hydraulic development. The problem is, therefore, not only to store and have on hand sufficient water to meet all immediate needs, but also to adopt a long-range program so that the supply for Egypt and Sudan will be guaranteed at all times.

Disagreement among riparian states concerning the established historical rights of the past and present, as well as on the repartition of supply made available by possible future engineering works and a revision of the existing agreements, constitutes the ground on which the Nile question is based and hampers the development of any joint water development plan. Little progress has been made toward the coordinated planning and development of the water resources of the Nile basin, in spite of the fact that all countries in the basin would only gain from cooperation in its management. Decisions about investment in water development projects, new irrigation schemes, and industrial projects will have consequences in the future when water resources are in greater demand. The environmental and climatic changes of the 1980s have accelerated the need to make economic, political, and legal adjustments in the existing Nile allocation regime.⁹⁰ For a number of reasons, the time has come to consider how cooperation among the riparian countries can be secured on an institutionalized basis in order to promote the welfare of the people throughout the Nile basin.

The populations of the co-basin states have grown steadily since 1960 in spite of famines and civil wars in Ethiopia and Sudan. For instance, in 1987 there were approximately 117 million people in Egypt, Sudan, and Ethiopia; by the year 2000, there will probably be between 160 and 170 million people in these combined areas. Today Egypt's pop-

89. Okidi, *supra* note 85, at 432-33.

90. D. Wittington & E. McClelland, *Opportunities for Regional and International Cooperation in the Nile Basin* 1-2 (1991).

ulation is about ten percent larger than Ethiopia's; by the year 2025, if current population projections prove true, Ethiopia's population will be 20 percent larger than that of Egypt.⁹¹ This population growth will substantially increase the demand for water for all uses: domestic, agricultural, industrial, and commercial.

Increased population and economic growth also lead to increased pollution and, therefore, to a reduction in high-quality water. Furthermore, the deforestation taking place in the Ethiopian highlands diminishes the ability of watersheds in the Nile basin to retain rainfall.

During the last 30 years, Egypt has maintained its position as the dominant economic power in the Nile basin with a per capita gross national product (GNP) twice that of Sudan and five times that of Ethiopia. All of the economies of the Nile basin states are weak and burdened with debt. This situation allows Egypt to forge ahead with its own projects. For instance, a desert reclamation program which introduces irrigation technologies and crop varieties that are well suited to desert conditions is underway. In addition, Egypt now has excess supplies of natural gas that can be used to provide the energy for pumping water to new reclamation projects. The Egyptian Land Master Plan proposes that 580,000 hectares be considered for priority reclamation. It is envisaged that the additional water supply needed will come from drainage water re-use, so Egypt apparently will not require water supplies in excess of its current allocation under the 1959 Nile Water Agreement.⁹² It should be noted that the continuation of Egypt's current desert reclamation plans will make it extremely difficult to reduce Egypt's water allocation in order to adjust to new upstream uses.

The estimated increase in "yield" to be made available through the completion of all of the Upper Nile projects in Egypt is about 18 BCM (Jonglei Phase I, Jonglei Phase II, Machar Marshes, and Bahr-el-Ghazal). The scheme would have increased the mean flow at Aswan by an estimated 3.8 BCM, which was to have been shared by Egypt and Sudan. Construction of the Jonglei Canal began in 1978, but in 1983 the project was halted due to the civil war in southern Sudan; during the last eight years, no progress has been made.⁹³ In addition, the Sudd region of Sudan is the largest freshwater swamp in the world and is habitat to a unique variety of wildlife. Any project in the area will be subject to close scrutiny by environmentalists, and international financing will be subject to this constraint.⁹⁴ River basin planning re-

91. *Id.* at 6.

92. *Id.* at 6, 10.

93. *Id.* at 14.

94. A. Tahir & M. Sammani, *Environmental and Socio-economic Impact of Jonglei Canal Project, Water Supply & Management*, Vol. 4, pp. 45-51 (1980).

quires that water resources decision makers think comprehensively about the value of water for different uses, locations, and time periods, and devise ways of ensuring that water is utilized in the most beneficial way. Lately, an awareness of the need for regional cooperation has been achieved in all of the countries of the basin.⁹⁵

LEGAL ASPECTS

There are a number of international agreements concerning the Nile River basin. Most of them pertain to rights to use the Nile water or specifically limit such rights. Others merely reserve rights to one party to the treaty, either through bilateral declarations or through specific consent from one party to another, without a reciprocal grant of compensation. The content of other agreements pertains to the acceptance of freedom of navigation, boundary demarcation, and permission to undertake the construction of hydraulic works.⁹⁶ Relevant portions of these international agreements are described below.

1. Protocol signed in Rome on April 15, 1891, between the U.K. and Italy, which stipulates in Article 3 that, "the Italian government undertakes not to construct on the Atbara . . . any works which might sensibly modify its flow into the Nile."⁹⁷

2. Agreement between the U.K. and Ethiopia, signed at Addis Ababa on May 15, 1902. Article III provides, "H.M. the Emperor Menelik II, King of Kings of Ethiopia, engages himself toward the Government of His Britannic Majesty not to construct or allow to be constructed, any work across the Blue Nile, Lake Tana or the Sobat, which would arrest the flow of their waters into the Nile, except in agreement with His Britannic Majesty's Government and the Government of the Sudan."⁹⁸

3. Treaty between the U.K. and what was then known as the Congo, signed at London on May 9, 1906, provides in Article 3 that, "The Government of the Independent State of Congo undertakes not to construct or allow to be constructed any work over or near the Semliki or Sanago Rivers which would diminish the volume of water entering Lake Albert, except in agreement with the Sudanese Government."⁹⁹

95. B. Boutros-Ghali, *Water Management in the Nile Valley*, in *Water Technology International* 35 (1990).

96. For a general legal survey, see R. Batstone, *The Utilization of the Nile Waters*, 8 Int'l & Comp. L.Q. 523-58 (1959); A. Garretson, *The Nile Basin*, in *The Law of International Drainage Basins* 257-97 (A. Garretson ed., 1967).

97. 19 E. Hertslet, *The Map of Africa by Treaty* 686-88 (Nos. 289, 949) (1967); P. Ogilvie, *International Waterways* 343 (1920); H. Smith, *The Economic Uses of International Waterways* 166 (1931).

98. Hertslet, *supra* note 97, at 431-32 (No. 100); Ogilvie, *supra* note 97, at 343; Smith, *supra* note 97, at 166.

99. Hertslet, *supra* note 97, at 584-86 (No. 165); Ogilvie, *supra* note 97, at 343; Smith, *supra* note 97, at 168.

4. Agreement of December 13, 1906 between the U.K., France, and Italy, preserving the integrity of Ethiopia and further providing for the safeguarding of, "the interests of U.K. and Egypt in the Nile Basin, especially as regards the regulation of the waters of that river and its tributaries" ¹⁰⁰

5. Assurance in 1925 by the British High Commissioner for Sudan to the Egyptian government, that the British government has, "no intention of trespassing upon the natural and historic rights of Egypt in the waters of the Nile, which they recognize today no less than in the past." ¹⁰¹

6. Exchange of Notes of December 14-20, 1925 between Italy and the U.K., through which Italy recognized the prior hydraulic right of Egypt and Sudan in the headwaters of the Blue Nile and White Nile Rivers and their tributaries, and agreed, "not to construct on the headwaters . . . any works which might sensibly modify their flow into the main river . . ." The Italian note of December 20, 1925, continues, "I note that His Britannic Majesty's Government have every intention of respecting the existing water rights of the population of neighboring territories" ¹⁰²

7. Exchange of Notes between the U.K. and Egypt, signed in Cairo on May 7, 1929, reading in part,

Save with the agreement with the Egyptian Government, no irrigation or power works or measures are to be constructed or taken on the Nile River and its branches or on the lakes from which it flows, so far as all these are in the Sudan . . . which would, in such a manner as to entail any prejudice to the interests of Egypt, either reduce the quantity of water arriving in Egypt or modify the date of its arrival, or lower its level." ¹⁰³

8. Agreement between Belgium and the U.K. regarding water rights on the boundary between Rwanda Burundi and what was formerly Tanganyika, signed in London on November 22, 1934, and providing that, "Water diverted from a part of a water course situated wholly within either territory shall be returned without substantial reduction to its natural bed at some point before such water course flows into the other territory or at some point before such water course forms the common boundary." ¹⁰⁴ In the event that either government desires to utilize the water on the boundary, it shall give the other government six months' notice before commencing operations, "in order to permit

100. 2 E. Hertslet, *The Map of Africa by Treaty* 442 (1967) (art. IV (a)).

101. 1929 Gr. Brit. T.S. No. 17, at 33.

102. 50 L.N.T.S. 282 (1925).

103. See 93 L.N.T.S. 46 (1930); see also Smith, *supra* note 97, at 212-14 (para. 4(b)).

104. Agreement Regarding Water Rights on the Boundary Between Tanganyika and Rwanda Urundi, Belgium-U.K., Nov. 22, 1934, art. 1.

the consideration of any objections which the other government may wish to raise."¹⁰⁵

9. Exchange of Notes of 1952 between Egypt and the U.K., concerning the construction of the Owen Falls Dam.¹⁰⁶

10. Agreement of 1959 between Egypt and the Sudan, providing for full utilization of the Nile waters.¹⁰⁷ This agreement allocates 55.5 BCM of water to Egypt and 18.5 BCM to Sudan. It does not reserve any share for upstream riparians and states that, "in the case of any request from upstream States for a share in the waters, Egypt and the Sudan shall present a common front." The agreement speaks, in fact, about the "full" utilization of the Nile waters.

11. Agreement of 1967, setting up the HYDROMET Survey Project between the Nile basin countries, with Ethiopia as an observer, for the collection of hydrometeorological data and the development of a water balance model.

12. Treaty of 1977 establishing the Kagera River Basin Organization, between Burundi, Rwanda, Tanzania and Uganda.¹⁰⁸ The Kagera River is the source of the White Nile before the Kagera enters Lake Victoria; the organization established under this Treaty has the purpose of developing the White Nile.

13. Agreement of December, 1992, setting up a Technical Cooperation Committee for the Promotion of the Development and Environment Protection of the Nile Basin (TECCONILE) as a transitional three-year follow-up arrangement to the HYDROMET Survey Project.

14. Agreement of 1 July, 1993, between Egypt and Ethiopia, establishing a framework for cooperation in the utilization of the waters of the Nile River.¹⁰⁹

THE POSITIONS OF THE CO-RIPARIANS

Egypt, because of its geographical location within the basin, its established uses from time immemorial, the existing agreements and the generally accepted principles of international law, claims "historical rights" to a certain amount of water, which is fixed at 55.5 BCM, according to the Water Agreement of 1959.¹¹⁰ Ethiopia and other upper

105. United Nations, *Legal Aspects of Hydro-electric Development of Rivers and Lakes of Common Interest* (229 U.N. Doc. E/ECE/EP 98 Rev. 1) (1952).

106. 207 U.N.T.S. 278 (1952).

107. 453 U.N.T.S. 51 (1959).

108. Agreement for the Establishment of the Organization for the Management and Development of the Kagera River Basin (OBK), signed at Rusumo, Aug. 24, 1977. Uganda became a member of the Organization by the Agreement of May 19, 1981 (reprinted in *UN/Africa Water Treaties*).

109. Survey of World Broadcasts, ME/1731, A/4, of 3 July, 1993.

110. 453 U.N.T.S. 51 (1959).

riparians have not officially stated their position with respect to this matter.

Egypt contends that any additional water supplies made available through the future construction of hydraulic works or claimed by the upper riparians will be shared between it and Sudan.¹¹¹ This position ignores underutilized but legal and natural rights of Burundi, Ethiopia, Kenya, Uganda, Tanzania, and Zaire.

A purely positivistic approach to the problem of the water rights of Egypt in international law from the part of the upper riparians would be prejudicial to Egypt, since, it is submitted, the legal validity of some of the Nile agreements is questionable, to say the least. The generally accepted principles of international customary law, which could substitute for these agreements as a second source of law, have not been recognized yet by Egypt, which, on the contrary, has given evidence, at least in the past, of strictly positivistic positions in its interpretation of the concept of sovereignty.

Reservoirs on the Blue Nile basin which would be located in Ethiopian territory would offer great advantages in the long term for the integrated management of the Nile.

Egypt is vulnerable to unilateral water withdrawals by the upper riparians outside of a comprehensive Nile water allocation and planning framework. Thus, Egypt has more to gain than any of the other co-riparians from increased cooperation. In this connection, it is important that Egypt begin negotiations without placing preconditions on any of the parties, such as those contained in the philosophy of the 1959 Nile Agreement.¹¹² It is obvious that Egypt will have to make some concessions to upstream riparians, and it will view the new relationships with these countries, particularly with Ethiopia, as a new arrangement, opening a new era. Egypt will rightly expect to receive compensation for concessions, such as joint investment projects, increased data collection, joint regulation and monitoring of the river flow, and participation in the overall management of the Nile basin water.

While recognizing the existence of Egyptian "historical rights," Sudan is not entirely satisfied with the 1959 water agreement fixing its share at 18.5 BCM.¹¹³ In her international approach to the Nile question, Sudan, like Egypt, so far has ignored the potential but "natural rights" of the upper riparian countries, though Sudan is conscious of the existence of these rights.

From a basin-wide planning perspective, Sudan's political policies are quite different from those of Egypt. Sudan has a strong inter-

111. *Id.*

112. See *supra* note 107 and accompanying text.

113. 453 U.N.T.S. 51 (1959).

est in developing cooperative arrangements with Ethiopia, and the construction of dams on the Blue Nile in Ethiopian territory should be one of the Sudan's top priorities.

It is in Sudan's best interest to have Ethiopia included in new Nile arrangements. The completion of any dams in Ethiopia will take many years, and joint planning should proceed as soon as possible. Sudan should attempt to convince Egypt to join in discussions with Ethiopia without imposing preconditions on use of the amounts already allocated. Sudan can do so in view of the fact that it is an upstream riparian vis-a-vis Egypt, and because of the hydraulic works of the Nile which are planned in Sudanese territory. Sudan will continue to maintain the agreed "united front" with Egypt, provided Egypt agrees to join in discussions about overall Nile basin management.

Ethiopia has claimed in the past that the fact that it provides six-sevenths (or five-sevenths, as recognized by Egypt) of the Nile water does not automatically entail tacit or explicit renunciation of its own quantitatively unspecified, but existing, "natural rights" to at least part of the same water flowing within its territory. Ethiopia's own future development projects in the field of water resources might make it imperative to retain some of the Nile water for its own consumption. Various announcements of these plans have been made in the Ethiopian press.¹¹⁴ Furthermore, the legal validity and binding force upon Ethiopia of the Nile agreements to which Ethiopia was a part, either directly or indirectly (through accession of Eritrea), might be questioned. These agreements prohibit any activity which might substantially interfere with the Nile basin flow.

The lack of regional cooperation in the development of the Nile water is detrimental to Ethiopia's interests. In order to develop its water resources, Ethiopia needs foreign investment in the middle term. This is not possible to secure without international assistance, which may require that previous agreement be secured with the other co-basin states. At the same time, the growth in Ethiopia's population requires that these investments take place sooner rather than later. The current Ethiopian policy of reserving the right to make unilateral claims on Nile water is not conducive to international cooperation, as it makes it difficult for international funding to take place. This delay in reaching new international agreements also allows Egypt to accrue water use rights without taking into consideration the impact on the rights of Ethiopia. The continuation of Egypt's desert reclamation policy, for ex-

114. Such as the press communiqué of the Ministry of Foreign Affairs published in the Ethiopian Herald Tribune on February 6, 1956, and the Ethiopian Aide Memoire of September 23, 1957, circulated in the diplomatic missions in Cairo. See 3 M. Whiteman Digest of International Law 1011-12 (1964).

ample, will greatly complicate future negotiations because it establishes a prior use of the water.

The recent agreement of July 1, 1993, would seem to open the door to a new era of cooperation.

The position of the upper riparian countries of Burundi, Kenya, Rwanda, Tanzania, Uganda, and Zaire is not openly known. International policy probably influences their approach to the Nile problem more than technical factors. Their interests in the Nile water mainly concern power production and the control of floods. These upstream states are not yet making any significant use of the Nile water, although Kenya, Uganda, and Tanzania are likely to develop irrigation around Lake Victoria and will need additional water.¹¹⁵ The existing agreements substantially limit any activity which diminishes the quantity of water flowing downstream, and this situation needs to be improved, even though these countries have an abundance of water.

The Kagera Basin Organization to develop the headwaters of the Nile ought to be considered when discussing a Nile Basin Authority. These entities perhaps should combined, as the Organization has received little financial assistance since 1986 and apparently is inactive.¹¹⁶

CONCLUSION

It is evident that the spirit of most past agreements among parties interested in the Nile basin water was directed toward protecting the existing uses in the lower riparian countries of Egypt and Sudan. An analysis of the agreements indicates that they are very limiting as to the possible extension of the water uses in middle- and upper-riparian countries. These conventions have not been officially repealed, although they have been affected by political developments of great consequence for all the co-riparians.

The bases for international agreement between the co-basin states have been in existence for a long time. However, a legal analysis of the existing conventions needs to be made in the light of new political developments in order to ascertain their validity in international law. On the other hand, the promotion of regional cooperation among the basin States is taking place and is clearly supported by the international community. In any case, such cooperation should extend to all basin states, including Ethiopia.

115. Beaumont, *supra* note 86, at 16.

116. R. Berthelot, Nile River Basin Development 1 (World Bank Working Paper, Jan. 1992).

The recent agreement of July 1, 1993, between Egypt and Ethiopia calls for the principle of good neighborliness and the peaceful settlement of disputes; the use of the waters is to be based on "international law," and the parties are not to do anything with the waters which may cause harm to the interests of the other party. The agreement makes provision for consultation and cooperation between the parties on mutually beneficial projects and for a comprehensive and integrated plan which should cover, *inter alia*, the means of reducing water loss. This is an extremely good development.

The co-riparians of the Nile River system are agricultural countries. Further large-scale agricultural, as well as industrial, development would be greatly facilitated through joint policies and action. This should include an adjudication of the existing international water rights and possibly the conclusion of new agreements.

The history of international river law shows that in situations similar to the one that exists in the Nile basin, there is a tendency to unify the various agreements into one convention encompassing all uses involved, *i.e.*, irrigation, navigation, flood control, power production, and fishing, so as to yield an equitable allocation of water for the benefit of all parties concerned. A revision of the water sharing agreements, based on the principle of equitable and reasonable utilization of Nile water by all basin states, should be established. This can be accomplished through negotiation.

The creation of an international body, such as a Nile Basin Authority, would ease greatly the solution of all possible conflicts and provide for the most economical development of the Nile basin as a coordinated and integrated whole. Such a body should not only administer the data collection activities performed by the HYDROMET and TECCONILE projects, but also should carry out the planning function through which the whole basin would be considered as a unit. Joint planning of projects and coordination of activities among co-basin states should be undertaken as soon as possible. An appropriate mechanism for decision making should be devised. In this way the legal assurance of a well defined amount of water on which to rely would be ensured for all co-riparians, and international financing would be facilitated. The international body could also serve as a forum for determining policies with respect to the crises generated by water shortages, floods, pollution, the population explosion in the basin and, generally, for dealing with all interstate frictions and misunderstandings.

It is not too late to undertake such actions. Indeed, the economic and social development of the Nile basin countries is inextricably linked to the success of international cooperation.