

5-1-1996

The Two Rivers and the Lands Between: Mesopotamia and the International Law of Transboundary Waters

Joseph W. Dellapenna

Follow this and additional works at: <https://digitalcommons.law.byu.edu/jpl>



Part of the [International Law Commons](#), [Water Law Commons](#), and the [Water Resource Management Commons](#)

Recommended Citation

Joseph W. Dellapenna, *The Two Rivers and the Lands Between: Mesopotamia and the International Law of Transboundary Waters*, 10 BYU J. Pub. L. 213 (1996).

Available at: <https://digitalcommons.law.byu.edu/jpl/vol10/iss2/4>

This Article is brought to you for free and open access by BYU Law Digital Commons. It has been accepted for inclusion in Brigham Young University Journal of Public Law by an authorized editor of BYU Law Digital Commons. For more information, please contact hunterlawlibrary@byu.edu.

The Two Rivers and the Lands Between: Mesopotamia and the International Law of Transboundary Waters

Joseph W. Dellapenna*

I. INTRODUCTION

All rivers and most aquifers of significance across the entire sweep of the Middle East, from Marrakech to Samarkand, are internationally shared water resources. The Middle East is the largest dry region (and the driest large region) on Earth; thus there is considerable (and growing) potential for conflict over these shared waters. I have already written extensively about various disputes relating to these more conflict-prone river basins of the region.¹ In this article, I will examine two such

* Professor of Law, Villanova University; LL.M., Columbia University (1974) (Environmental Law); LL.M. in Public International and Comparative Law, George Washington University (1969); J.D., Detroit College of Law (1968); B.B.A. University of Michigan (1965).

1. See WATER IN THE MIDDLE EAST: CONFLICT OR COOPERATION? 157-80 (Thomas Naff & Ruth Matson eds. 1984) [hereinafter WATER IN THE MIDDLE EAST]; Joseph Dellapenna, *Building International Water Management Institutions: The Role of Treaties and Other Arrangements*, in WATER IN THE MIDDLE EAST: LEGAL, POLITICAL AND COMMERCIAL IMPLICATIONS 55 (J.A. Allan & Chibli Mallat eds. 1995) [hereinafter LEGAL, POLITICAL AND COMMERCIAL IMPLICATIONS]; Joseph Dellapenna, *Designing the Legal Structures of Water Management Needed to Accomplish the Israeli-Palestinian Declaration of Principles*, 7 PALESTINE Y.B. INT'L L. 63 (1994); Joseph Dellapenna, *Rivers as Legal Structures: The Examples of the Jordan and the Nile*, 36 NAT. RESOURCES J. ____ (forthcoming 1996); Joseph Dellapenna, *The Waters of the Jordan Valley: The Potential and Limits of Law*, 5 PALESTINE Y.B. INT'L L. 15 (1990); Joseph Dellapenna, *Treaties as Instruments for Managing Internationally-Shared Water Resources: Restricted Sovereignty vs. Community of Property*, 26 CASE-W. RES. J. INT'L & COMP. L. 27 (1994). See generally JOSEPH DELLAPENNA, MIDDLE EAST WATER: THE LIMITS AND POTENTIAL OF LAW (forthcoming 1996).

For twelve years, I have consulted on the Middle East Water Project, under the Direction of Dr. Thomas Naff, first at the Middle East Research Institute of the University of Pennsylvania and later with the Associates for Middle East Research, Inc. The project has already produced a single volume study, WATER IN THE MIDDLE EAST, *supra*, and is now preparing a series of volumes on specific aspects of the water in the Middle East to be entitled WATER: THE MIDDLE EAST IMPERATIVE, publication having begun in 1990. My contribution to the series, MIDDLE EAST WATER: THE POTENTIAL AND LIMITS OF LAW, is completed and is to be published in 1996. I have also consulted with the Portuguese Directory-General of Natural Resources (Direcção-Geral dos Recursos Naturais) as a Fulbright grantee in the summer of 1990.

conflict-prone river basins of the region—that of the Euphrates and the Tigris Rivers, the two rivers that together bound “Mesopotamia.”

Mesopotamia—the “land between the rivers”—rivals Egypt as the birthplace of hydrology.² Not so long ago—only some 12,000 years ago or so—the Middle East was not a dry region. During the Ice Ages, rainfall was plentiful and the Sahara and other deserts of the region were watered by now extinct rivers which fed broad grasslands with occasional small forests. After the glaciers retreated, the region rapidly dried out. This global climate change presented the relatively dense human population of hunters and gatherers with the prospect of imminent starvation, and presumably prompted most people in the region to migrate.³ However, in the region near Mesopotamia, people found a way to adapt without migrating. Apparently, a few women (who were responsible for gathering, storing, and preparing seeds for eating) discovered that they could plant some of those seeds and thereby multiply the yield sufficiently to sustain their communities and even support an increase in population.⁴ This transition—the invention of agriculture—occurred first in the hills stretching from what is now southeastern Turkey down through Syria and Lebanon to what is now Israel and Palestine.

These early farmers did not know much about farming, and their practices caused heavy erosion of the hillsides where they planted. The soil washed down to fill the now dry valleys below, leaving behind

The analysis and conclusions are my own, and do not necessarily represent the views of the American or Portuguese governments or of the Associates for Middle East Research, or of the Middle East Research Institute.

2. See JACQUETTA HAWKES & LEONARD WOOLEY, *PREHISTORY AND THE BEGINNINGS OF CIVILIZATION* 418-19 (1963); DANIEL HILLEL, *RIVERS OF EDEN: THE STRUGGLE FOR WATER AND THE QUEST FOR PEACE IN THE MIDDLE EAST* 97-98 (1994); NURIT KLIOT, *WATER RESOURCES AND CONFLICT IN THE MIDDLE EAST* 116-17 (1994); LUDWIK TECLAFF, *THE RIVER BASIN IN HISTORY AND LAW* 15-25, 42-46 (1967); Yahia Bakour & John Kolars, *The Arab Mashrek: Hydrologic History, Problems and Perspectives*, in *WATER IN THE ARAB WORLD: PERSPECTIVES AND PROGNOSSES* 121, 123-27 (Peter Rogers & Peter Lydon eds., 1994); Mahmood Clor, *A Land of Milk and Honey . . . and Salt*, *GEOGRAPHICAL MAG.*, Nov. 1988, at 34; Robert Hager, Note, *The Euphrates Basin: In Search of a Legal Regime*, 3 *GEORGETOWN INT'L ENVTL. L. REV.* 207, 207 (1990); Walid Saleh, *Development Projects on the Euphrates*, in *ISRAEL AND ARAB WATER* 69, 70-71 (Abdel Majid Farid & Hussein Sirriyeh eds. 1985). See generally ROBERT ADAMS, *LAND BEHIND BAGHDAD: A HISTORY OF SETTLEMENT ON THE DIYALA PLAINS* (1965); GEORGE CRESSEY, *CROSSROADS* (1960); WILLIAM WILCOCKS, *THE IRRIGATION OF MESOPOTAMIA* (2d ed. 1917); WILLIAM WILCOCKS, *THE RESTORATION OF THE ANCIENT IRRIGATION WORKS ON THE TIGRIS* (1903). On the early Egyptian experience with hydrology, see KARL BUTZER, *EARLY HYDRAULIC CIVILIZATION IN EGYPT* (1976).

3. HILLEL, *supra* note 2, at 42-45. See also ARIE S. ISSAR, *WATER SHALL FLOW FROM THE ROCK: HYDROGEOLOGY AND CLIMATE IN THE LANDS OF THE BIBLE* (1990).

4. See generally JANE JACOBS, *THE ECONOMY OF CITIES* 18-48 (1969).

barren hillsides that are now characteristic of the region that gave birth to wheat-based agriculture. After a millennium or more, the farmers discovered that by digging ditches from the rivers out onto the remarkably flat plains of the land between the Euphrates and Tigris Rivers to bring water out to the now deep soils, they could bring the water to where the soil had already gone.⁵ This transition introduced several major cultural changes that together we describe as the birth of civilization. In particular, the ensuing increase in productivity enabled the creation of the first true cities in what anciently was called the "Fertile Crescent."

Since the advent of agriculture, human life in the Middle East has always depended on successful management of the limited fresh water available in the region, especially once artificially irrigated agriculture was invented.⁶ Irrigation requires the continuous application of more labor than the dry farming of the hills had required. Men as well as women now had to take part in agricultural work, especially irrigation, and this work had to be done in under strong, centralized leadership.⁷ Yet siltation and salination from poor irrigation practices undermined the richness of the lands—the heart of the "Fertile Crescent"—a millennium ago, and the ravages of war completed the breakdown of the ancient irrigation systems by the middle of the thirteenth century.⁸

5. HILLEL, *supra* note 2, at 51-54.

6. See ISSAR, *supra* note 3; John Noble Wilford, *Collapse of Earliest Known Empire [Akkad] Is Linked to Long, Harsh Drought*, N.Y. TIMES, Aug. 24, 1993, at C1. The decline of cultures because of the failure to sustain elaborate hydraulic systems is not unique to the Middle East. See, e.g., FERENC GARAMI & ISTVAN KERTAI, *WATER MANAGEMENT IN THE ANGKOR AREA* (1993).

7. See generally ADAMS, *supra* note 2; F.J. BERBER, *RIVERS IN INTERNATIONAL LAW* 1-2 (R.K. Batstone trans. 1959); DANTE A. CAPONERA, *PRINCIPLES OF WATER LAW AND ADMINISTRATION* 11-25 (1992); *IRRIGATION'S IMPACT ON SOCIETY* (Theodore E. Downing & McGuire Gibson eds. 1974); TECLAFF, *supra* note 2, at 15-25, 28-32, 42-47; KARL WITTFOGEL, *ORIENTAL DESPOTISM: A COMPARATIVE STUDY OF TOTAL POWER* (1957); Bakour & Kolars, *supra* note 2, at 121, 123-27; Lon Fuller, *Irrigation and Tyranny*, 17 STAN. L. REV. 1021 (1965); Vujica Yevjevich, *Water and Civilization*, 17 WATER INT'L 163 (1992).

8. PETER BEAUMONT, GERALD BLAKE & J. MALCOLM WAGSTAFF, *THE MIDDLE EAST: A GEOGRAPHICAL STUDY* 362 (2d ed. 1988); H.E. DREGNE, *DESERTIFICATION OF ARID LANDS* 11 (1983); HILLEL, *supra* note 2, at 51-58; KLIOT, *supra* note 2, at 117; LUDWIK TECLAFF, *WATER IN HISTORICAL PERSPECTIVE* 1 (1985); Bakour & Kolars, *supra* note 2, at 126; Clor, *supra* note 2, at 34; Robert Hager, Note, *The Euphrates Basin: In Search of a Legal Regime*, 3 GEORGETOWN INT'L ENVTL. L. REV. 207, 211-12 (1990); Terje Tvedt, *The Struggle for Water in the Middle East*, in *SUSTAINABLE WATER RESOURCES MANAGEMENT IN ARID COUNTRIES: MIDDLE EAST AND NORTH AFRICA* 13, 15, 18, 28 (Eric Schiller ed., 1992).

On the problem of salination of soils generally, see F. GHASSEMI, A.J. JAKEMAN, & H.A. NIX, *SALINISATION OF LAND AND WATER RESOURCES: HUMAN CAUSES, EXTENT, MANAGEMENT AND CASE STUDIES* (1995); Mahmoud abu-Zeid, *Water Resources Assessment for Egypt*, in *SUSTAINABLE WATER RESOURCES*, *supra* at 173, 182-88; William Burns, *The International Convention to Combat Desertification: Drawing a Line in the Sand?*, 16 MICH.

Poor irrigation practices that cause soil salination and other environmental depredations have been a recurring problem since irrigation began in Mesopotamia, leading to the collapse of earlier civilizations, particularly in the lower reaches of the twin basins.⁹ Traces of abandoned canals and tells (hills composed of rubble) of abandoned villages testify to the rise and decline of earlier communities, states, and empires. The region's dependence on the water of the the Euphrates and the Tigris continues to shape the political and economic life of the land between the two rivers, and provides a structure for the legal disputes over water in the Mesopotamia today.

This article examines the modern law of the two rivers as found in treaties, less formal arrangements, and international legal custom. In part II, I describe the hydrologic setting for the modern law of the rivers. In part III, I discuss the economic and political context of that law. Finally, in part IV, I analyze the law itself. I conclude the paper with observations on how the yet unresolved legal problems of the two rivers might best be handled, and the prospects for such an outcome.

II. THE HYDROLOGIC SETTING

Although the Euphrates and Tigris Rivers are virtually separate, united only for the last 190 kilometers (118 miles) in the Shatt al-'Arab (the "Shore of the Arabs"),¹⁰ it is customary to treat them as a single socio-hydrologic unit because the two rivers in practice are shared by three states—Iraq, Syria, and Turkey—and those three states generally manage the three rivers in a coordinated fashion. Iran, which is a source of tributaries to the Tigris River, has not made any substantial use of those waters nor any claim to a share of the main stem of the Tigris.¹¹

Of the two rivers that have shaped human life in the "Fertile Crescent," the Euphrates (Firat to the Turks, and Furat to the Arabs) is the longer and for much of its length the larger, and is more centrally located in the region. The Euphrates arises in the mountains of eastern Turkey, flows southwest for a time, and then turns southeast to flow

J. INT'L L. 831, 843-44 (1995); Clor, *supra* note 2, at 34; Yahia Abdel Mageed, *The Central Region: Problems and Perspectives*, in *WATER IN THE ARAB WORLD: PERSPECTIVES AND PROGNOSIS* 101, 112-14 (Peter Rogers & Peter Lydon eds., 1994).

9. Clor, *supra* note 2, at 34; George Cressey, *The Shatt al-Arab Basin*, 12 *MIDDLE EAST J.* 448, 448-49 (1958); Tvedt, *supra* note 8, at 18; Wilford, *supra* note 6.

10. KLIOT, *supra* note 2, at 100, 111; Bakour & Kolars, *supra* note 2, at 127.

11. KLIOT, *supra* note 2, at 170; John Kolars, *Water Resources in the Middle East*, in *SUSTAINABLE WATER RESOURCES MANAGEMENT IN ARID COUNTRIES: MIDDLE EAST AND NORTH AFRICA* 103, 118 (Eric Schiller ed., 1992).

across the northwest of Syria and then down the length of Iraq.¹² At 2,700 kilometers (1,675 miles), it is the longest river in southwestern Asia and the second longest in the vast region stretching from Morocco to Iran.¹³ Despite its length, however, the Euphrates is a fairly small river. Its normal annual flow, as measured at Hit in Iraq, averages around 32 billion cubic meters ("BCM") annually, ranges between 10 BCM and 40 BCM depending on variations in precipitation upstream.¹⁴ The average flow is a bit less than half of the current average flow of the Nile and less than one-third of the average flow of the Nile in former centuries.¹⁵ The Euphrates averages only one-fourth the volume of the Rhine, a river that drains only a comparatively small region of humid western Europe.¹⁶

12. The geography of the Euphrates is described in brief but useful detail in Saleh, *supra* note 2, at 69-70. See also KLIOT, *supra* note 2, at 102.

13. HILLEL, *supra* note 2, at 92; Bakour & Kolars, *supra* note 2, at 137. Nurit Kliot gives the length of the Euphrates as 3,000 kilometers (1,865 miles). KLIOT, *supra* note 2, at 100-01. Walid Saleh gives the length as 2,330 kilometers (1,450 miles). Saleh, *supra* note 2, at 70. See also Hasam Chalabi & Tarek Majzoub, *Turkey, the Waters of the Euphrates and Public International Law*, in *WATER IN THE MIDDLE EAST: LEGAL, POLITICAL AND COMMERCIAL IMPLICATIONS* 189, 191 (J.A. Allan & Chibli Mallat eds. 1995); Jonathan Cohen, Note, *International Law and the Water Politics of the Euphrates*, 24 N.Y.U. INT'L L. & POL. 502, 507 (1991); Cressey, *supra* note 2, at 448. The discrepancies arise from differences of opinion regarding which of several streams is the furthest source stream of the Euphrates as opposed to a mere tributary.

14. HILLEL, *supra* note 2, at 95, 102; KLIOT, *supra* note 2, at 108-09; JOHN KOLARS & WILLIAM MITCHELL, *THE EUPHRATES RIVER AND THE SOUTHEAST ANATOLIA* 284-85 (1991); *WATER IN THE MIDDLE EAST: CONFLICT OR COOPERATION?* 86 (Thomas Naff & Ruth Matson eds., 1984); M.M. Badry, et al., *Water Resources in Iraq*, in *IRRIGATION AND AGRICULTURAL DEVELOPMENT* 315, 315 (S.S. Juhl ed., 1980); Peter Beaumont, *The Euphrates River—An International Problem of Water Resources Development*, 5 ENVTL. CONSERVATION 35, 36 (1978); Bakour & Kolars, *supra* note 2, at 137; Özden Bilen, *Prospects for Technical Cooperation in the Euphrates-Tigris Basin*, in *INTERNATIONAL WATERS OF THE MIDDLE EAST: FROM EUPHRATES-TIGRIS TO NILE* 95, 96-103 (Asit Biswas ed., 1994); Tvedt, *supra* note 8, at 14; Boaz Wachtel, *The Peace Canal Project: A Multiple Conflict Resolution Perspective for the Middle East*, in *WATER AND PEACE IN THE MIDDLE EAST* 363, 365 (Jad Isaac & Hillel Shual ed., 1994) See generally Cressey, *supra* note 2, at 449-50, 458.

15. The Nile currently averages between 70 BCM and 84 BCM per year, and several centuries ago average a little above 100 BCM per year. See HILLEL, *supra* note 2, at 119; KLIOT, *supra* note 2, at 22; JOHN WATERBURY, *HYDROPOLITICS OF THE NILE VALLEY* 13-14, 20-22, 40 (1979); *WATER IN THE MIDDLE EAST*, *supra* note 1, at 128; Mesfin Adebe, *The Nile—Source of Regional Cooperation or Conflict?*, 20 WATER INT'L 32, 32 (1995); Peter Chesworth, *The History of Water Use in Sudan and Egypt*, in *THE NILE: RESOURCE EVALUATION, RESOURCE MANAGEMENT, HYDROPOLITICS AND LEGAL ISSUES* 41, 41 (P.P. Howell & J.A. Allan eds., 1990); Geoff Petts, *Riches of the Nile*, GEOGRAPHICAL MAG. Mar. 1988, at 24, 26-27.

16. Tvedt, *supra* note 8, at 14-15.

As with most rivers in the Middle East, the Euphrates is an "exotic" river that arises naturally in well-watered mountains and flows across an extensive dry area before reaching the sea.¹⁷ While crossing the dry regions of northeastern Syria and the length of Iraq, it experiences large evapotranspiration and seepage (infiltration) losses, becoming smaller as it approaches the sea. The largest and last significant tributary of the Euphrates—the Khabur River—arises in southeastern Turkey and joins the Euphrates shortly after it enters Syria. The Khabur and other, smaller streams that also join the Euphrates in Syria add about 2 BCM to the flow, but these tributaries arise in Turkey and most of their flow as well represents precipitation over Turkey.¹⁸ Virtually no water joins the river after crossing the Iraqi border, though evaporation rates reach as high as 70%.¹⁹ Thus the Euphrates is largest well before it crosses the Iraqi-Syrian border. In all, about 98% of the water flowing in the Euphrates derives from Turkey, and about 2% from Syria.²⁰

The Tigris also arises in eastern Turkey (only 30 kilometers from one of the sources of the Euphrates) and flows south into Iraq.²¹ The boundaries of Syria were drawn by the British and the French to enable the far northwest corner of Syria to barely reach to the upper Tigris. The Tigris forms part of the Syrian border with Turkey for 36 kilometers (22

17. CHRISTIAAN GISCHLER, *WATER RESOURCES IN THE ARAB MIDDLE EAST AND NORTH AFRICA* 5 (1979); HILLEL, *supra* note 2, at 92; *WATER IN THE MIDDLE EAST*, *supra* note 1, at 85-86. For just how dry most of Iraq is, see KLIOT, *supra* note 2, at 105-08; Bakour & Kolars, *supra* note 2, at 131-32; Cressey, *supra* note 2, at 448, 450.

18. HILLEL, *supra* note 2, at 95; *WATER IN THE MIDDLE EAST*, *supra* note 1, at 83; Bakour & Kolars, *supra* note 2, at 128-30.

19. HILLEL, *supra* note 2, at 95, 97; Bilen, *supra* note 14, at 108; Cressey, *supra* note 2, at 455. See also EDWARD GOLDSMITH & NICHOLAS HILDYARD, *THE SOCIAL AND ENVIRONMENTAL EFFECTS OF LARGE DAMS* 140 (1984); Bakour & Kolars, *supra* note 2, at 128-29.

20. KLIOT, *supra* note 2, at 112, 114-15; KOLARS & MITCHELL, *supra* note 14, at 3-5, 191; *WATER IN THE MIDDLE EAST*, *supra* note 1, at 83-84; Beaumont, *supra* note 14, at 37; Cohen, *supra* note 13, at 507; George Gruen, *Recent Negotiations over the Waters of the Euphrates and Tigris*, in *PROC. INT'L SYMPOSIUM ON WATER RESOURCES IN THE MIDDLE EAST: POLICY AND INSTITUTIONAL ASPECTS* 100, 104 (Glenn Stout & Radwan Al-Weshah eds. 1993; Hager, *supra* note 2, at 209, 219; George Joffé, *The Issue of Water in the Middle East and North Africa*, in *RESOURCE POLITICS: FRESHWATER AND REGIONAL RELATIONS* 65, 75 (Caroline Thomas & Darryl Hewlitt eds. 1993); Tvedt, *supra* note 8, at 15.

Two Turkish commentators have generously attributed 12% of the flow to Syria, apparently based on where the tributaries join the Euphrates, but without allowing for the fact that most of the water in those tributaries derives from precipitation in Turkey. Chalabi & Majzoub, *supra* note 13, at 191.

21. HILLEL, *supra* note 2, at 96. For succinct but useful description of the geography of the Tigris, see M.G. IONIDES, *THE REGIME OF THE RIVERS EUPHRATES AND TIGRIS* 115-18 (1937); KLIOT, *supra* note 2, at 102-04.

miles) and with Iraq for a length of eight kilometers (5 miles).²² It is one third-shorter than the Euphrates, measuring only about 1,840 kilometers (1,140 miles).²³ It also has a smaller flow until well into Iraq. The average flow of the Tigris as measured at Mosul in northern Iraq is 23 BCM.²⁴

The Tigris, flowing further to the east and close to the mountains that mark the border between Iran and Iraq, exhibits some important features differentiating it from other rivers in the region. Most importantly, it receives major tributaries along its entire length, including several tributaries that arise in Iran, and many of which enter the main river in Iraq. One of those tributaries, the Greater Zab, contributes as much as 13 BCM annually, and the tributaries reaching the Tigris in Iraq collectively contribute an average of around 30 BCM/year.²⁵ Thus, although the Tigris, like the Euphrates, experiences the major evapo-transpiration and seepage losses characteristic of this dry, desert region, it is not an exotic river for it maintains and even enlarges its flow as it approaches the sea. In fact, the Tigris measures about 49 BCM per year at its terminus in the Shatt al-'Arab, although this flow varies considerably from year to year.²⁶ As with the Euphrates, the major scene of historic use was in Iraq, but only a small amount of the water in the river was contributed by precipitation over Iraq. About 43% of the total flow derives from Turkey, with about 42% deriving from rainfall over mountains in eastern Iraq, and about 9% from Iran.²⁷

Early in their history, the Euphrates and the Tigris each reached the Persian Gulf separately, but the growth of their deltas eventually led to their merger into the Shatt al-'Arab. Prior to 1974, the flow into the Shatt, really a vast swampland that is home to the "Marsh Arabs," measured about 66 BCM (a bit less than the average flow of the Nile).

22. KLIOT, *supra* note 2, at 100.

23. HILLEL, *supra* note 2, at 92; KLIOT, *supra* note 2, at 100-01; Bakour & Kolars, *supra* note 2, at 137; Cressey, *supra* note 9, at 448; Kolars, *supra* note 11, at 106.

24. HILLEL, *supra* note 2, at 96; KLIOT, *supra* note 2, at 110; Bakour & Kolars, *supra* note 2, at 128; Bilen, *supra* note 14, at 96; Tvedt, *supra* note 8, at 15. Iraqi hydrologists have estimated the flow as 31.5 BCM. Badry, Mehdi, & Khawar, *supra* note 14, at 316.

25. HILLEL, *supra* note 2, at 96; IONIDES, *supra* note 21, at 129; KLIOT, *supra* note 2, at 110; Badry, Mehdi, & Khawar, *supra* note 14, at 316; Bakour & Kolars, *supra* note 2, at 128; Kolars, *supra* note 11, at 108; Tvedt, *supra* note 8, at 15.

26. HILLEL, *supra* note 2, at 96, 102; KLIOT, *supra* note 2, at 110; WATER IN THE MIDDLE EAST, *supra* note 1, at 86-87; Bakour & Kolars, *supra* note 2, at 128, 137; Kolars, *supra* note 11, at 106, 108. See generally Cressey, *supra* note 9, at 449-50.

27. KLIOT, *supra* note 2, at 113-15; Beaumont, *supra* note 14, at 37; Gruen, *supra* note 20, at 104; Kolars, *supra* note 11, at 108; Joffé, *supra* note 20, at 75. See also Bakour & Kolars, *supra* note 2, at 127-28; Chalabi & Majzoub, *supra* note 13, at 191.

Most of the flow into the Shatt was lost through evaporation, and only a feeble 20 BCM were discharged annually into the Persian Gulf.²⁸ Of this combined flow, a bit more than 49 BCM (nearly 75%) were contributed by the Tigris, with the remainder coming from the Euphrates.²⁹

Today, the Shatt al-'Arab forms part of the border between Iran and Iraq, and has been the ostensible focus of the Middle East's longest and bloodiest war.³⁰ The disputes over the Shatt have been primarily over navigation and not over the consumptive uses that are the focus of this article. While forming the boundary between Iraq and Iran, the Shatt receives the overall system's last major tributary—the Kharun. At 830 kilometers (515 miles), The Kharun is the longest river in Iran. But for the sharing of the Shatt with Iraq, the Kharun would be entirely within Iran.³¹

III. THE ECONOMIC AND POLITICAL CONTEXTS

The most notable economic and political feature of the two rivers is that Iraq, the major consumer of water from the rivers, contributes only small amounts of water to the flow of the Tigris and virtually none to the Euphrates.³² Growing populations have placed immense pressure on

28. Cressey, *supra* note 9, at 455. The figure for total flow comes from Kolars, *supra* note 11, at 106-08. Estimates for total flow range as high as 84 BCM/year—similar to estimates for the current annual average flow for the Nile. BEAUMONT, BLAKE, & WAGSTAFF, *supra* note 8, at 364; KLIOT, *supra* note 2, at 110; Bakour & Kolars, *supra* note 2, at 127. The different estimates might simply reflect the high variability of the flow of the two rivers from year to year. BEAUMONT, BLAKE, & WAGSTAFF, *supra*, at 357. For the geography of the Shatt-al-Arab, see WATER IN THE MIDDLE EAST, *supra* note 1, at 85; Cressey, *supra* note 9, at 448-49, 452.

29. One recent study gave a much higher estimate for the Euphrates' contribution to the Shatt-al-Arab, concluding that it accounted for about 58% of the combined flow in the Shatt. BEAUMONT, BLAKE, & WAGSTAFF, *supra* note 8, at 84.

30. See generally SHAHRAM CHUBIN & CHARLES TRIPP, IRAN AND IRAQ AT WAR (1988); GULF SECURITY AND THE IRAN-IRAQ WAR (Thomas Naff ed. 1985); THE GULF WAR OF 1980-1988: THE IRAN-IRAQ WAR IN INTERNATIONAL LEGAL PERSPECTIVE (Ige Deekker & Harry Post eds. 1992); DILIP HIRO, THE LONGEST WAR: THE IRAN-IRAQ MILITARY CONFLICT (1991); THE IRAN-IRAQ WAR: ITS IMPACT AND IMPLICATIONS (Efraim Karsh ed. 1989); THE IRAN-IRAQ WAR: NEW WEAPONS, OLD CONFLICTS (S. Tahir-Kheli & S. Ayubi eds. 1983); TAREQ ISMAEL, IRAN AND IRAQ: ROOTS OF CONFLICT (1982); THE PERSIAN GULF WAR: LESSONS FOR STRATEGY, LAW AND DIPLOMACY (Christopher Joyner ed. 1990); SANDSTORMS: MIDDLE EAST CONFLICT AND AMERICA (Daniel Pipes ed. 1993).

31. WATER IN THE MIDDLE EAST, *supra* note 1, at 85-87; Kolars, *supra* note 11, at 118. See also KLIOT, *supra* note 2, at 104, 111; Cressey, *supra* note 9, at 448. The Kharun joins the Shatt-al-Arab 72 kilometers (45 miles) from the Gulf. Bakour & Kolars, *supra* note 2, at 127.

32. Tvedt, *supra* note 8, at 15.

each of the three riparian states: The combined populations of Iraq, Syria, and Turkey have grown from about 39,000,000 in 1960 to around 84,000,000 in 1990.³³ Iran could add another 55,000,000 to the possible base of demand.³⁴ All four of these riparian states depend heavily on agriculture to employ their populations, and only Iraq and Iran have strong alternate resource bases in oil.³⁵ Each of the four countries must import substantial quantities of food to feed their growing populations, in quantities amounting to between 7% and 17% of their needs.³⁶ Yet Iraq continues to employ 35% of its labor force in agriculture compared to only 3% in the oil industry.³⁷ The wars and revolutions of their recent history have left the Iraqi and Iranian economies largely in ruins despite all their oil, leaving them to fall back on agriculture nearly as much as Syria and Turkey have always depended on it.³⁸

Iraq's dominance of the consumption of the Euphrates was nearly total until the 1960's, with little water being consumed at all in Syria or Turkey,³⁹ a pattern that can be traced back to the earliest antiquity. The three states have responded to the pressures of growing population by seeking agricultural self-sufficiency. To do this, they have sought to create adequate storage capacity within their own borders to satisfy their own plans without regard to the activities of the other riparian states.⁴⁰ All this storage considerably increases the evaporation losses from the

33. KLIOT, *supra* note 2, at 153-54, 160; JOYCE STARR & DANIEL STOLL, U.S. FOREIGN POLICY ON WATER RESOURCES IN THE MIDDLE EAST 12 (1987); Cohen, *supra* note 13, at 516; Tvedt, *supra* note 8, at 17.

34. KLIOT, *supra* note 2, at 153; J.A. Allan, *Irrigated Agriculture in the Middle East: The Future*, in AGRICULTURAL DEVELOPMENT IN THE MIDDLE EAST, *supra* note 39, at 51.

35. KLIOT, *supra* note 2, at 151-57. See generally Günter Meyer, *Economic Development in Syria since 1970*, in POLITICS AND ECONOMY IN SYRIA 39 (J.A. Allan ed. 1987).

36. KLIOT, *supra* note 2, at 154.

37. Cohen, *supra* note 13, at 511; Joyce Starr & Stephen Alley, *Troubled Waters Ahead for Iraqi Irrigation*, FIN. TIMES, Oct. 21, 1988, § 1, at 5. Greg Shapland gives the figure of 20% as the employment level for agriculture. Greg Shapland, *Policy Options for Downstream States in the Middle East*, in WATER IN THE MIDDLE EAST, *supra* note 9, at 301, 316. In any event, Mahmood Clor has aptly caught the difference: "Oil, discovered in 1926, is the basis of Iraq's wealth but water from the Tigris and the Euphrates rivers is its sustenance." Clor, *supra* note 2, at 34.

38. KLIOT, *supra* note 2, at 152-53, 170.

39. Addeane Calleigh, *Middle East Water: Vital Resource, Conflict and Cooperation*, in A SHARED DESTINY 121, 124 (Joyce Starr & Addeane Calleigh eds. 1983); Cohen, *supra* note 13, at 511; Tvedt, *supra* note 8, at 15. At least some see the timing of the Syrian and Turkish development of the waters of the Euphrates came as a response to Egyptian propaganda depicting the High Dam at Aswan as the key to modernization and progress in the region, leading other governments to feel compelled to undertake similar projects. Chalabi & Majzoub, *supra* note 13, at 197-98.

40. HILLEL, *supra* note 2, at 109; KLIOT, *supra* note 2, at 122-123, 160.

Euphrates system, especially in the hot dry plains of Iraq.⁴¹ Such losses are particularly unfortunate as the three states together propose to store more than 200 BCM of Euphrates water—nearly three times the annual average flow of the two rivers combined (70-75 BCM).⁴² Not only can the Euphrates not sustain all this storage, but the storage projects also decreases the total water available to all by more than 10% due to loss by evaporation of about 8 BCM from the reservoirs.⁴³

In this section, I shall examine in turn the Iraqi use of the Euphrates, the Syrian challenge to Iraqi dominance of the river, the Turkish challenge to the Iraqi and Syrian *modus vivendi*. I will then summarize the situation regarding the Tigris. Finally, I will examine the one proposal for joint activity on the rivers—the “Peace Pipeline.” Not until the next section will I address the legal aspects of these experiences and proposals.

A. *Iraq and the Euphrates*

The two rivers have been depositing silt across their mouths for millennia, and today the greater part of Iraq is a nearly flat plain composed of former delta lands aggregating more 100,000 square kilometers.⁴⁴ The still heavy silt loads of the two rivers gives rise to the two distinctive features of the Iraqi plain: It is extremely fertile if properly watered, and the rivers actually flow above the level of the plain. This latter feature arose because of the constant threat of flooding by the rivers.⁴⁵ The rivers have been contained by levees which cause significant amounts of silt to settle in the river bed, thereby raising the beds as well as the banks of the rivers above the level of the surrounding land.⁴⁶

Irrigation began in what now is Iraq at least 6,000 years ago, but, as already noted, experienced periods of major decline due to the salination of the soil, and never recovered from the devastations of the Mongol

41. IONIDES, *supra* note 21, at 111; KLIOT, *supra* note 2, at 122, 136; Beaumont, *supra* note 14, at 38-39.

42. Iraq proposes to store 100 BCM, Syria 15 BCM, and Turkey 90 BCM. HILLEL, *supra* note 2, at 102-03. See also KLIOT, *supra* note 2, at 144-50, 167; WATER IN THE MIDDLE EAST, *supra* note 1, at 93, 96-97; Bakour & Kolars, *supra* note 2, at 137-40; Zohurul Bari, *Syrian-Iraqi Dispute over the Euphrates Waters*, 16 INT’L STUD. 227, 238 (1977); Beaumont, *supra* note 14, at 39; Kolars, *supra* note 11, at 108; Tvedt, *supra* note 8, at 16.

43. HILLEL, *supra* note 2, at 103. A disproportionate share of this loss occurs in Iraq (5+ BCM) because of its extremely dry climate.

44. HILLEL, *supra* note 2, at 93; KLIOT, *supra* note 2, at 102.

45. See generally Cressey, *supra* note 9, at 449-55.

46. HILLEL, *supra* note 2, at 54, 93-94, 96, 304-05 n.2; Tvedt, *supra* note 8, at 15.

invasion in 1258.⁴⁷ Thereafter irrigation, while carried out on a small scale, largely languished until the early twentieth century. As elsewhere in the Middle East, British engineers began the development of modern irrigation on the Euphrates in the later years of the nineteenth century with the construction of the Al Hindiya Barrage in 1909, with other dams and canals following down to the present time.⁴⁸ Dams and barrages on the Tigris followed in short order. By the 1970's, Iraq was consuming about 13 BCM from the Euphrates annually to irrigate about 1,550,000 hectares,⁴⁹ and was consuming another 17 BCM from the Tigris River to irrigate another 1,200,000 hectares or so.⁵⁰ Only about 25% of the agricultural lands in Iraq—in the hills near the Tigris River—rely on rainfall as opposed to irrigation.⁵¹ About 42% of Iraq's total surface is irrigated.⁵²

By 1970, Iraq's total water total consumption of 30 BCM/year (from the Euphrates, the Tigris, and other sources) arose from a base of supply generally ranging from 76 and 84 BCM/year, 98% of which was found in the Euphrates and Tigris system.⁵³ In contrast, Syria was then consuming about 2 BCM/year from the two rivers, mainly from the Euphrates, and Turkey about 820 MCM/year from the two rivers, also

47. HILLEL, *supra* note 2, at 15-16, 44-45, 51-58, 72-73, 98-99; TECLAFF, *supra* note 8, at 1; Clor, *supra* note 2; Marc Ross, Comment, *Environmental Warfare and the Persian Gulf War: Possible Remedies to Combat Destruction of the Environment*, 10 DICKINSON J. INT'L L. 515, 517 (1992); Tvedt, *supra* note 8, at 15, 18.

48. HILLEL, *supra* note 2, at 99; KLIOT, *supra* note 2, at 117-20; WATER IN THE MIDDLE EAST, *supra* note 1, at 89-90, 92-93; Badry, Mehdi, & Khawar, *supra* note 14, at 318; Chalabi & Majzoub, *supra* note 13, at 198; Clor, *supra* note 2, at 34-35; Hager, *supra* note 2, at 211; John Kolars, *Problems of International River Management: The Case of the Euphrates*, in INTERNATIONAL WATERS OF THE MIDDLE EAST, *supra* note 14, at 44, 82-83; Saleh, *supra* note 2, at 72-73; Tvedt, *supra* note 8, at 15.

49. KLIOT, *supra* note 2, at 144; Bakour & Kolars, *supra* note 2, at 135; Kolars, *supra* note 11, at 107. Estimates as to the amount of water consumed from the Euphrates and as to the amount of land irrigated actually vary considerably. See Martin Adams & James Holt, *The Use of Land and Water in Modern Agriculture—An Assessment*, in AGRICULTURAL DEVELOPMENT IN THE MIDDLE EAST 63, 64 (Peter Beaumont & Keith McLachlan eds. 1985); Herbert Ockerman & Shimon Samano, *The Agricultural Development of Iraq*, in AGRICULTURAL DEVELOPMENT IN THE MIDDLE EAST, *supra*, at 189, 192; K. Ubell, *Iraq's Water Resources*, in 7 NATURE & RESOURCES, No. 2, at 3, 4 (1971); John Waterbury, *Transboundary Water and the Challenge of International Cooperation in the Middle East*, in WATER IN THE ARAB WORLD, *supra* note 2, at 39, 63 n.10.

50. Kolars, *supra* note 11, at 108; Tvedt, *supra* note 8, at 15. These figures are also highly variable. KLIOT, *supra* note 2, at 146; Ubell, *supra* note 49, at 4.

51. GISCHLER, *supra* note 17, at 99; KLIOT, *supra* note 2, at 143.

52. Abdul-Karim Sadik & Shawki Barghouti, *The Water Problems of the Arab World: Management of Scarce Resources*, in WATER IN THE ARAB WORLD, *supra* note 2, at 1, 8.

53. BEAUMONT, BLAKE, & WAGSTAFF, *supra* note 3, at 84; GISCHLER, *supra* note 17, at 100; W.B. FISHER, THE MIDDLE EAST 388 (1978); KLIOT, *supra* note 2, at 143.

mainly from the Euphrates.⁵⁴ A decade later the Syrian and Turkish figures were more than doubled.⁵⁵ The pressures on the Euphrates would continue to rise throughout the remaining two decades of the twentieth century, placing Iraq in an extremely vulnerable position even before the war with Iran and the Gulf War.

Iraq, under Saddam Hussein, responded to the threat by doubling its financial commitment to water facilities and bringing several new dams on line in the later 1980s.⁵⁶ These efforts increased Iraq's current total storage capacity to around 100 BCM.⁵⁷ Before the Gulf War, Iraq was planning to irrigate an additional 1,830,000 hectares, mostly between Hit and Hindiya, to improve drainage of the irrigated lands in lower Iraq, to divert water from the Tigris to the Euphrates, and to increase its hydroelectric generation.⁵⁸ Improved drainage is particularly important to Iraq as the only effective means of dealing with the continuing problem of soil salination,⁵⁹ although the drainage projects have been criticized as an "environmental crime" and as attempted genocide against the Marsh Arabs.⁶⁰ In all, the Iraqi designs will require diversions from the Euphrates aggregating in the neighborhood of 25 BCM annually—nearly double the diversions from that river in 1970.⁶¹ Unfortunately, Turkish releases from the Atatürk Dam will only be about 15 BCM or less annually,⁶² and Syrian usage will consume the bulk of this flow.⁶³

Since 1980, Iraq has been continuously at war with Iran, or over Kuwait, or with portions of its own population. Iraq faced a threatening situation regarding water before it embarked on its wars with its neighbors. Before the Gulf War, Iraq employed only about 12% of its labor force in agriculture to generate about 7% of its Gross Domestic

54. Bakour & Kolars, *supra* note 2, at 128; Kolars, *supra* note 11, at 107.

55. KLIOT, *supra* note 2, at 143.

56. Badry, Mehdi, & Khawar, *supra* note 14, at 318; Cohen, *supra* note 13, at 510-11; Hager, *supra* note 2, at 212; Starr & Alley, *supra* note 37; Tvedt, *supra* note 8, at 15.

57. KLIOT, *supra* note 2, at 122; Badry, Mehdi, & Khawar, *supra* note 14, at 316.

58. HILLEL, *supra* note 2, at 100-02; KLIOT, *supra* note 2, at 145, 147; WATER IN THE MIDDLE EAST, *supra* note 1, at 92, 98; Badry, Mehdi, & Khawar, *supra* note 14, at 325-26; Bilen, *supra* note 14, at 103-07; Chalabi & Majzoub, *supra* note 13, at 206 n.48; Kolars, *supra* note 11, at 117; Kolars, *supra* note 48, at 83-87; Saleh, *supra* note 2, at 73-74; Tvedt, *supra* note 8, at 16.

59. CRESSEY, *supra* note 2, at 390; FISHER, *supra* note 53, at 387; HILLEL, *supra* note 2, at 99; KLIOT, *supra* note 2, at 158-59; Cressey, *supra* note 9, at 452; Ubell, *supra* note 49, at 9.

60. HILLEL, *supra* note 2, at 102.

61. KLIOT, *supra* note 2, at 145; Kolars, *supra* note 48, at 84. For the 1970 figures, see the text *supra* at notes 49-53.

62. Chalabi & Majzoub, *supra* note 13, at 204. See also the text *infra* at notes 214-15.

63. KLIOT, *supra* note 2, at 146; Chalabi & Majzoub, *supra* note 13, at 204.

Product.⁶⁴ This effort, however, consumed 92% of its water usage.⁶⁵ We have no reliable figures regarding the use of water in Iraq today, although the continuing international boycott of Iraqi oil and other products suggests that agriculture plays an even greater role in the economy today than before the war. After two disastrous wars and with heavy pre-war debts to service, it is doubtful that Iraq will be able to pay for its food imports even if the restrictions on its sale of oil were to be lifted.⁶⁶

As the most downstream state sharing the twin basins, Iraq is in a particularly exposed situation. In a strong sense, Iraq epitomizes the comment of Samuel Baker, a British explorer of the late nineteenth century: "No water, no Arabs."⁶⁷ The Iraqis were already experiencing water shortages during the summer months before Syrian and Turkish development, for these hot dry months produce an average flow of half or less of the winter peaks, yet these are precisely the months in which the growing crops most need water.⁶⁸ Impending development in the upstream states portends possible disaster for Iraq, with Iraq losing perhaps as much as 90% of the Euphrates waters on which it has depended for millennia.⁶⁹ It goes too far, however, to suggest as historian Terje Tvedt that Iraq could be devastated to a similar extent as it was during the invasions led by Hulagu Khan in 1258.⁷⁰ Much of this shortfall could be made up by compensatory diversions from the Tigris over to the Euphrates farms.⁷¹ Iraqi agricultural practices are also inefficient, leaving considerable room to forestall some losses by improved methods of irrigation and drainage.⁷² Still, diversions from the Tigris and improved efficiency leaves no room for increasing the agricultural lands and probably will result in some net losses in the face of a steadily increasing population. The Iraqis then have a sound basis

64. KLIOT, *supra* note 2, at 158.

65. Sadik & Barghouti, *supra* note 52, at 3.

66. KLIOT, *supra* note 2, at 159.

67. As quoted in Tvedt, *supra* note 8, at 29.

68. KLIOT, *supra* note 2, at 109.

69. *Id.*, at 146.

70. Tvedt, *supra* note 8, at 18.

71. KLIOT, *supra* note 2, at 146; Kolars, *supra* note 11, at 117; Saleh, *supra* note 2, at 73-74; Shahim Tekeli, *Turkey Seeks Reconciliation for the Water Issue Induced by the Southeastern Anatolian Project (GAP)*, 15 WATER INT'L 206, 215 (1990); Tvedt, *supra* note 8.

72. BEAUMONT, BLAKE, & WAGSTAFF, *supra* note 3, at 352, 364; FISHER, *supra* note 42, at 378; KLIOT, *supra* note 2, at 146, 150, 158, 163-64, 170; WATER IN THE MIDDLE EAST, *supra* note 1, at 98; Cressey, *supra* note 9, at 458; Ockerman & Samano, *supra* note 39, at 194; Saleh, *supra* note 2, at 73-74; Ubell, *supra* note 39, at 3. Syria also has considerable inefficiencies. WATER IN THE MIDDLE EAST, *supra*, at 97-98.

in experience to fear significant diminution in the quantity, quality, or rate of flow of the water flowing down to them.⁷³

B. *The Syrian Challenge to Iraq*

The practice of leaving Iraq near exclusive use of the waters of the Euphrates and the Tigris began to change in the 1960's when Syria announced plans to construct the Tabqa Dam designed to store about 12 BCM the Euphrates River in a reservoir named Lake Assad.⁷⁴ Syria is a generally dry state that has little water available from catchment areas within its territory. Syria depends primarily on water flowing in the Euphrates and the Orontes Rivers, both rivers that originate in mountains outside Syria.⁷⁵ Even the Yarmuk River, the catchment area of which is largely in Syria, is an international stream shared with the Israelis and the Jordanians.⁷⁶ Though more than 85% of Syria's agriculture is rain-fed,⁷⁷ rainfed agriculture generally is less productive than irrigated agriculture, even in humid regions.⁷⁸ Yet for Syria to undertake to develop its water resources, a necessary precondition to increasing its agricultural output, the development will nearly always implicate international concerns. This is particularly true regarding the Euphrates, easily Syria's largest river and most important water resource: The 30 BCM it brings into Syria is about 10 times the total of all other surface sources in Syria combined, and six times as much as all other water sources combined.⁷⁹

The international dimensions of water use in Syria were most clearly visible in the dispute over the Tabqa Dam. Under prodding from Western agencies, Iraq and Syria had been engaged in serious negotiations over the undertaking of a joint project on the Euphrates; these negotiations broke down when Soviet funding became available.⁸⁰ The Tabqa Dam was then constructed with Soviet Aid after the World Bank

73. TECLAFF, *supra* note 8, at 1; Tvedt, *supra* note 8, at 18-19; Wilford, *supra* note 6.

74. Badry, Mehdi, & Khawar, *supra* note 14, at 317; Bari, *supra* note 42; Kolars, *supra* note 48, at 44, 80-82; Tvedt, *supra* note 8, at 15-16, 28. See also KLIOT, *supra* note 2, at 120-22, 161-62; Saleh, *supra* note 2, at 74.

75. KLIOT, *supra* note 2, at 137-38.

76. HILLEL, *supra* note 2, at 169, 310 n.18; KLIOT, *supra* note 2, at 209-12, 222-24; Dellapenna, *Jordan Valley*, *supra* note 1, at 20, 26-27; Bakour & Kolars, *supra* note 2, at 133-34; Aaron Wolf, *A Hydropolitical History of the Nile, Jordan and Euphrates River Basins*, in INTERNATIONAL WATERS OF THE MIDDLE EAST, *supra* note 14, at 5, 34.

77. KLIOT, *supra* note 2, at 139; Sadik & Barghouti, *supra* note 52, at 8.

78. See Sadik & Barghouti, *supra* note 52, at 7.

79. GISCHLER, *supra* note 17, at 114; HILLEL, *supra* note 2, at 107; KLIOT, *supra* note 2, at 138.

80. Chalabi & Majzoub, *supra* note 13, at 198-201.

and western institutions declined to finance it,⁸¹ and introduced a period of intense dispute between the states riparian to Euphrates. By 1975, with the flow of water in the Euphrates reduced from an expected 920 cubic meters per second ($\text{m}^3/\text{sec.}$) to only 197 $\text{m}^3/\text{sec.}$, Iraq and Syria seemed on the verge of war over the waters of the Euphrates.⁸² Iraq apparently failed to understand that Syria's actions were not the only cause of Iraq's water shortage; 1974 was an exceptionally dry year, and Turkey also began filling the reservoir behind its Keban Dam in 1974.⁸³

The dispute over the Tabqa Dam, between two left-leaning Arab states both ruled by factions of the Ba'ath Party, was largely ignored in the West where it did not fit either the paradigm of Cold War conflict or the paradigm of Arab-Israeli conflict.⁸⁴ After mediation by Saudi Arabia and the Soviet Union, Syria agreed to slow the filling of its reservoir and to assure that 40% of the flow of the river came down to Iraq, ostensibly as an act of "goodwill" rather than because it accepted any Iraqi legal claim to receive the water.⁸⁵ While controversy diminished under this arrangement, Iraqi diplomatic protests recurred from time to time. Syria in turn supported Iran in its war with Iraq without becoming directly involved in any fighting and took an active part in supporting the Allied Coalition during the Gulf War.⁸⁶ Water concerns were certainly not the only reasons for Syria's posture on these matters, and probably not even primary reasons, but concerns over water probably played a role at least in reinforcing Syrian policies decided on other grounds.

81. WATER IN THE MIDDLE EAST, *supra* note 1, at 97; Chalabi & Majzoub, *supra* note 13, at 197-200; Tvedt, *supra* note 8, at 16.

82. HILLEL, *supra* note 2, at 108-09; WATER IN THE MIDDLE EAST, *supra* note 1, at 90, 93-94; Chalabi & Majzoub, *supra* note 13, at 196; Cohen, *supra* note 13, at 511-12; Gruen, *supra* note 20, at 100; Hager, *supra* note 2, at 212; Joffé, *supra* note 20, at 75; Kolars, *supra* note 48, at 65; Shapland, *supra* note 37, at 313; Joyce Starr, *Water Wars*, 82 FOREIGN POL'Y 17, 31 (1991); Tvedt, *supra* note 8, at 16; Wolf, *supra* note 76, at 5, 29.

83. KLIOT, *supra* note 2, at 111, 136, 161-62; WATER IN THE MIDDLE EAST, *supra* note 1, at 91; Beaumont, *supra* note 14, at 41; Mahmood Clor, *A River of Contention*, GEOGRAPHICAL MAG., Nov. 1988, at 36; Cohen, *supra* note 13, at 511; Hager, *supra* note 2, at 212; Waterbury, *supra* note 49, at 57. The filling of the Tabqa Dam was delayed by the porous nature of the limestone underlying the reservoir; this was solved by injecting cement into the limestone and covering the whole with clay. HILLEL, *supra* note 2, at 105.

84. Tvedt, *supra* note 8, at 16. See also KLIOT, *supra* note 2, at 166; WATER IN THE MIDDLE EAST, *supra* note 1, at 95.

85. EBERHARD KIENLE, BA'ATH VERSUS BA'ATH: SYRIAN RELATIONS WITH IRAQ SINCE 1968, at 96-100 (1990). See also HILLEL, *supra* note 2, at 109; KLIOT, *supra* note 2, at 161-62; WATER IN THE MIDDLE EAST, *supra* note 1, at 93-96; Cohen, *supra* note 13, at 512; Gruen, *supra* note 20, at 100; Tvedt, *supra* note 8, at 16; Waterbury, *supra* note 49, at 57; Wolf, *supra* note 76, at 29.

86. KLIOT, *supra* note 2, at 166; Tvedt, *supra* note 8, at 16.

The Syrians intended to use the Tabqa Dam to irrigate approximately 640,000 hectares.⁸⁷ In fact water was applied to land more slowly than planned, largely because of poor soils in the reclamation area, so that even today somewhat less than 400,000 hectares are actually irrigated.⁸⁸ The dam also fell far short of its projected electricity production.⁸⁹ Syria's storage on the Euphrates is now about 12 BCM⁹⁰ and proposes to increase this to 15 BCM.⁹¹ This storage, if unhindered by the activities or needs of other riparian states, is adequate to accomplish the proposed irrigation and to provide water for hydroelectric generation and for export to the urban centers in western Syria.⁹²

Despite the effort that has gone into the Tabqa Dam, the amount of land actually irrigated in Syria has fallen by perhaps as much as 20% since 1960, with only about 24% of Syrian labor continuing to be employed in agriculture.⁹³ Syrian agriculture today produces about 28% of the Gross Domestic Product,⁹⁴ yet still consumes 83% of Syria's water usage.⁹⁵ The loss of irrigated land in Syria has been variously attributed to the inundation of good land behind the Tabqa and other dams, waterlogging and salination of soils, and even the impact of land reforms.⁹⁶ In an effort to increase the amount of irrigated lands, Syria was committing as much as 40% of its national budget to irrigation and hydroelectric facilities by 1988.⁹⁷ This heavy investment is directed at doubling or tripling withdrawals from the Euphrates to a level approach-

87. HILLEL, *supra* note 2, at 109; WATER IN THE MIDDLE EAST, *supra* note 1, at 91; Bakour & Kolars, *supra* note 2, at 134; Kolars, *supra* note 48, at 81-82; Tvedt, *supra* note 8, at 16.

88. BEAUMONT, BLAKE, & WAGSTAFF, *supra* note 3, at 383; HILLEL, *supra* note 2, at 107-08; KLIOT, *supra* note 2, at 139; KOLARS & MITCHELL, *supra* note 14, at 260; WATER IN THE MIDDLE EAST, *supra* note 1, at 90-91, 97; Chalabi & Majzoub, *supra* note 13, at 205, 213; Cohen, *supra* note 13, at 511; Kolars, *supra* note 11, at 106; Kolars, *supra* note 48, at 81-82; Tvedt, *supra* note 8, at 16.

89. Cohen, *supra* note 13, at 509-10; David Ottaway, *Turkey Vies with Syria for Water*, WASH. POST, May 19, 1984, at A19, A22.

90. GISCHLER, *supra* note 17, at 114; KLIOT, *supra* note 2, at 122, 138.

91. HILLEL, *supra* note 2, at 109.

92. GISCHLER, *supra* note 17, at 114; KLIOT, *supra* note 2, at 142-43.

93. BEAUMONT, BLAKE, & WAGSTAFF, *supra* note 3, at 383; KLIOT, *supra* note 2, at 139; Shapland, *supra* note 37, at 316.

94. KLIOT, *supra* note 2, at 157; Ian Manners & Tagi Sagafi-Nejad, *Agricultural Development in Syria*, in AGRICULTURAL DEVELOPMENT IN THE MIDDLE EAST, *supra* note 39, at 255, 257; Sadik & Barghouti, *supra* note 52, at 1, 10.

95. Sadik & Barghouti, *supra* note 52, at 3.

96. KLIOT, *supra* note 2, at 139, 157; Bilen, *supra* note 14, at 108-09; Manners & Sagafi-Nejad, *supra* note 94, at 263. See generally GOLDSMITH & HILDYARD, *supra* note 19, at 140-47.

97. Tvedt, *supra* note 8, at 16. See also HILLEL, *supra* note 2, at 109.

ing 10 BCM annually.⁹⁸ Work that has also begun on a project to pump water up from the Tigris gorge to irrigate 150,000 hectares will no doubt generate yet further international disputes.⁹⁹ Notwithstanding all of this effort, however, Syria may face a serious water deficit by the year 2000 thanks to largely to the GAP project in Turkey.¹⁰⁰

C. Turkey Enters the Game

Turkey is one of the few states in the entire Middle East that can fairly be described as having a water surplus,¹⁰¹ primarily because, until recently, it had not invested heavily in developing its waters. Even before major investment in water projects began, employment in Turkish agriculture had declined to 40% of the Turkish labor force, and their contribution to Turkey's Gross National Product had declined to only 17%.¹⁰² This decline is likely due to the fact that, while *per capita* income in Turkey is a relatively prosperous (by Middle Eastern standards) US\$ 1,630 annually, farmers on average earn only about 40% of this figure.¹⁰³ Yet Turkey, alone of the states sharing the Mesopotamian basin, has the prospect of becoming wholly self-sufficient in agricultural production.¹⁰⁴ The highly mountainous east of Turkey was ideal for hydroelectric generation, while there were extensive areas in the Turkish portion of historic Mesopotamia that would lend themselves to irrigation. With this context in mind, it should not have surprised anyone when Turkey began to make major investments in dams and other water use facilities.

Turkey quietly completed its first large dam on the Euphrates at Keban in 1974.¹⁰⁵ Nine years later, in 1983, Turkey followed the filling of the Keban Dam by beginning work on its Southeast Anatolia

98. KLIOT, *supra* note 2, at 139-42; Beaumont, *supra* note 14, at 40.

99. KLIOT, *supra* note 2, at 138; Waterbury, *supra* note 49, at 63-64 n.12.

100. KLIOT, *supra* note 2, at 143; Godfrey Jansen, *Tussle over the Euphrates*, MIDDLE EAST INT'L, Feb. 16, 1990, at 12; Mikhail Wakil, *Analysis of Future Water Needs for Different Sectors in Syria*, 18 WATER INT'L 19 (1993).

101. KLIOT, *supra* note 2, at 104-08, 133-34, 137, 150; Bakour & Kolars, *supra* note 2, at 121-23, 139; Joffé, *supra* note 20, at 73; Kolars, *supra* note 11, at 117; Waterbury, *supra* note 49, at 39.

102. KLIOT, *supra* note 2, at 155-56; Keith McLachlan, *The Agricultural Development of the Middle East: An Overview*, in AGRICULTURAL DEVELOPMENT IN THE MIDDLE EAST, *supra* note 49, at 27, 34.

103. KLIOT, *supra* note 2, at 156; John Dewdney, *Agricultural Development in Turkey*, in CHANGE AND DEVELOPMENT IN THE MIDDLE EAST 213, 214 (John Clark & Howard Bowen Jones eds. 1981).

104. Cohen, *supra* note 13, at 508.

105. KLIOT, *supra* note 2, at 126, 161; Chalabi & Majzoub, *supra* note 13, at 199-200, 202; Tvedt, *supra* note 8, at 16.

Project (known by its Turkish acronym GAP—*Guneydogu Anadolu Projesi*).¹⁰⁶ The GAP will eventually include 15 dams, 14 hydroelectric facilities, and the irrigation of 700,000 hectares, a feat that will consume about 40% of the normal annual flow of the Euphrates as measured at the Keban Dam in eastern Turkey.¹⁰⁷ The center-piece of Turkey's GAP project is the massive Atatürk Dam, designed to store, by itself, the equivalent of about one-and-a-half years flow of the Euphrates River, in all about 49 BCM.¹⁰⁸ That storage, when combined with other planned or existing Turkish dams on the Euphrates, will aggregate over 100 BCM.¹⁰⁹ Turkey's storage is now sufficient to enable Turkey to consume about 21 BCM/year, and estimates for its eventual irrigation in the GAP range as high as 2,000,000 hectares.¹¹⁰

Turkey has experienced serious difficulties in accomplishing its grand plans for the Euphrates. International financing was denied because of the lack of agreement among the riparian states on how to share the waters of the Euphrates, leaving Turkey to generate the US\$ 21,000,-

106. See generally HILLEL, *supra* note 2, at 104-06; KLIOT, *supra* note 2, at 124-31; Chalabi & Majzoub, *supra* note 13, at 201-06.

107. NATASHA BESCHORNER, WATER AND INSTABILITY IN THE MIDDLE EAST 31 (Adelphi Paper No. 273, Institute for Strategic Studies 1992); HILLEL, *supra* note 2, at 37, 104-06; KOLARS & MITCHELL, *supra* note 14, at 260; Bakour & Kolars, *supra* note 2, at 137; Chalabi & Majzoub, *supra* note 13, at 189, 201-04, 214-15; Clor, *supra* note 83, at 36; Gruen, *supra* note 20, at 101-03; Kolars, *supra* note 11, at 106; Kolars, *supra* note 44, at 48-50, 54-63, 66-77; Tekeli, *supra* note 71, at 207; Tvedt, *supra* note 8, at 16; Okay Ünver & Bruno Voron, *Improvement of Canal Regulation Techniques: The Southeastern Anatolia Project-GAP*, 18 WATER INT'L 157 (1993); Waterbury, *supra* note 49, at 54. On the importance of hydropower to Turkey, see KLIOT, *supra* note 2, at 134-36. The precise number of dams, hydroelectric facilities, and irrigated hectares reported to the project vary considerably in different studies because the Turks themselves have frequently revised their plans; the figures in the text are less than half of those originally proposed. See HILLEL, *supra* note 2, at 105; KLIOT, *supra*, at 125; Beaumont, *supra* note 14, at 38; Cohen, *supra* note 13, at 508, 511; Clyde Haberman, *Sanliurfa Journal: Dam Is Watering Hope for a New Fertile Crescent*, N.Y. TIMES, Mar. 30, 1990, at A4; John Kolars, *The Hydro-Imperative of Turkish Search for Energy*, 40 MIDDLE EAST J. 53 (1986); Okay Ünver, Bruno Voron, & Turhan Aküzüm, *Improvement of Field Water Distribution and Irrigation Techniques: The Southeastern Anatolia Project-GAP*, 18 WATER INT'L 166, 167 (1993); Tvedt, *supra*, at 16. See generally U. Özis, *The South-East Anatolian Project in Turkey*, in POLICY AND INSTITUTIONAL ASPECTS, *supra* note 3, at 279.

108. KLIOT, *supra* note 2, at 126-29; Chalabi & Majzoub, *supra* note 13, at 205-06; Saleh, *supra* note 2, at 74; Wachtel, *supra* note 14, at 365. Daniel Hillel gives the storage capacity as an enormous 82 BCM. HILLEL, *supra* note 2, at 106.

109. KLIOT, *supra* note 2, at 122.

110. HILLEL, *supra* note 2, at 105; KLIOT, *supra* note 2, at 125, 127, 131, 134; Chalabi & Majzoub, *supra* note 13, at 204; Cohen, *supra* note 13, at 508; Gruen, *supra* note 20, at 101-03; Joffé, *supra* note 20, at 75; Kolars, *supra* note 11, at 106; Kolars, *supra* note 48, at 67; Waterbury, *supra* note 49, at 54.

000,000 needed for the GAP solely from internal sources.¹¹¹ The lack of international financing has slowed the pace of developing the project, particularly as regards extending irrigation as promised. Turkey further suffered from the Gulf War because before that war Turkey was Iraq's largest trading partner.¹¹² Since late 1990, no trade has been allowed between Iraq and Turkey. This reality has cost Turkey its primary source of oil and the revenues accruing to it as the major marketing outlet for Iraqi oil exported to Europe.¹¹³ Turkey's response of seeking greater economic integration into Europe has not thus far improved the opportunities for external financing of the GAP.

Being upstream, Turkey is in the strong position of having the physical capacity to block the flow of the water down to Iraq and Syria should Turkey decide to do so with the latter two states being able to do little about it short of war.¹¹⁴ Turkey, however, has the largest and best armed military in the region after Iraq's military was seriously weakened by the Gulf War, making a military response unlikely.¹¹⁵ In fact, some observers have noted that Turkey tends to exploit its dams for political advantage rather than merely using them to achieve its economic goals. These observers contend that Turkey has cut the flow of the Euphrates in order to pressure Syria to cut-off its support to Kurdish rebels in Turkey.¹¹⁶ Should Turkey abuse its dominant position, Iraq, and to a lesser extent Syria, will have to depend on law to protect their rights in the waters of the Euphrates and the Tigris, if these rights are to be protected at all, ironic as that might seem in light of Iraq's own dismal record towards compliance with international law.¹¹⁷

111. KLIOT, *supra* note 2, at 125, 130-31; Cohen, *supra* note 13, at 507; Gruen, *supra* note 20, at 102; Tvedt, *supra* note 8, at 17; Waterbury, *supra* note 49, at 55-56.

112. KLIOT, *supra* note 2, at 165-66; WATER IN THE MIDDLE EAST, *supra* note 1, at 100.

113. KLIOT, *supra* note 2, at 166, 170; WATER IN THE MIDDLE EAST, *supra* note 1, at 100; Waterbury, *supra* note 49, at 55. The breaking of the trade ties has freed Turkey to renew its claims to the largely Kurdish (and oil-rich) Mosul area, claims complicated by Kurdish desires for independence. See Daniel Pipes, *Hot Spot: Turkey, Iraq, and Mosul*, 2 MIDDLE EAST Q. 65 (1995).

114. KLIOT, *supra* note 2, at 111. See also Waterbury, *supra* note 49, at 43. For the relationship of upstream and downstream riparians in another Middle Eastern context, see Dellapenna, *Rivers as Legal Structures*, *supra* note 1.

115. Tvedt, *supra* note 8, at 19. See also KLIOT, *supra* note 2, at 166-67; WATER IN THE MIDDLE EAST, *supra* note 1, at 98-101; Waterbury, *supra* note 49, at 54. For the contrary view, see Calleigh, *supra* note 39, at 126; Cohen, *supra* note 13, at 516-18.

116. KLIOT, *supra* note 2, at 164-65; Shapland, *supra* note 37, at 301, 304.

117. See, e.g., Harry Almond, jr., *Weapons, War and the Environment*, 3 GEO. INT'L ENVTL. L. REV. 117 (1990); Louis René Beres, *Iraqi Crimes during and after the Gulf War: The Imperative Response of International Law*, 15 LOY.-L.A. INT'L & COMP. L.J. 675 (1993); Marc Caggiano, *The Legitimacy of Environmental Destruction in Modern Warfare: Customary Substance over Conventional Form*, 20 ENVTL. AFF. 479 (1993); Shulpi Gupta, *Iraq's Environmental Warfare in the Persian Gulf*, 6 GEO. INT'L ENVTL. L. REV. 251

G. *The Situation on the Tigris*

Development along the Tigris came more slowly than along the Euphrates because the Tigris flows through a more hilly (and thus better watered) terrain. Further, slow development occurred because the Tigris is smaller than the Euphrates until it is well into Iraq, and the flow of the Tigris is more variable from year to year than is the flow of the Euphrates.¹¹⁸ Even though the same three states shared the main course of the Tigris in the same relationship, when disputes did emerge in the middle years of the twentieth century their focus was within each of the two major user nations (Iraq and Turkey) rather than across their borders.¹¹⁹ Indeed, concerns about Tigris water in particular have played an important, albeit usually neglected, role in the vexing Kurdish question, for any independent Kurdistan would be a new riparian at least on the Tigris and possibly on the Euphrates as well, being downstream from Turkey and upstream from Iraq. This would expose the Iraqis to further demands on the water which they have been using, while Turkish Kurdistan includes the sites of several large dams planned by the Turks in fulfillment of the GAP project.¹²⁰

While the situation on the Tigris is not yet so close to crisis as on the Euphrates, at least in part because of the Kurdish rebellion, Turkish development plans do call for the withdrawal of up to 7 BCM per year from the Tigris during the early twenty-first century, enough to pose further significant problems for Iraq.¹²¹ When combined the impending negative water balance on the Euphrates, the Tigris developments would

(1993); Anthony Leibler, *Deliberate Wartime Environmental Damage: New Challenges for International Law*, 23 CAL. W. INT'L L. REV. 68 (1992); Liesbeth Lijnzaad & Gerard Tanja, *Protection of the Environment in Times of Armed Conflict: The Iraq-Kuwait War*, 40 NETH. INT'L L. REV. 169 (1993); Marc Ross, *Environmental Warfare and the Persian Gulf War: Possible Remedies to Combat Intentional Destruction of the Environment*, 10 DICK. J. INT'L L. 515 (1992); Carolyn Stannard, *Legal Protection of the Environment in Wartime*, 14 SYDNEY L. REV. 373 (1992); Rex Zedalis, *Burning of the Kuwaiti Oilfields and the Laws of War*, 24 VAND. J. TRANSNAT'L L. 711 (1991).

118. KLIOT, *supra* note 2, at 110; Cressey, *supra* note 9, at 450-51, 458; Kolars, *supra* note 11, at 117; Saleh, *supra* note 2, at 69.

119. Joffé, *supra* note 20, at 75-76; Tvedt, *supra* note 8, at 17.

120. HILLEL, *supra* note 2, at 37-38, 104-05; KLIOT, *supra* note 2, at 125, 165; Clor, *supra* note 83, at 36-37; Jansen, *supra* note 100, at 12-13; Kolars, *supra* note 48, at 84-85; Tvedt, *supra* note 8, at 17-18. On the Kurdish revolt generally, see John Darnton, *Discontent Seethes in Once-Stable Turkey*, N.Y. TIMES, Mar. 2, 1995, at A1, A8; Eric Rouleau, *The Challenges to Turkey*, 72 FOREIGN AFF., 110, 122-25 (No. 5, 1993). On one aspect of the Turkish response—a demand for the session of oil-rich Kurdish areas in Iraq to Turkey, see Pipes, *supra* note 113.

121. KLIOT, *supra* note 2, at 130; Kolars, *supra* note 11, at 108.

place Iraq in an impossible situation. These developments would also create an ecological disaster in the upper Persian Gulf.¹²²

Despite its contributions to the waters flowing in the Tigris basin, Iran has never been a major player in exploiting those waters. John Kolars has commented that "[o]f all the countries in the Middle East, Iran has had the least hydrologic involvement with its neighbors."¹²³ Still, Iran's future plans for hydrologic development are even more shrouded in secrecy than is characteristic of other national communities in the region. Should Iran at some point begin to extract considerable water from the tributaries that arise within its borders, the situation in Iraq would be even more desperate.

H. The "Peace Pipeline"

The situation in Turkey, particularly the Kurdish revolt but also the unwillingness of the international community to help finance the GAP, have prevented Turkey from developing uses for all the water from these rivers that it is beginning to store behind its mammoth dams. Turkey has responded by seeking markets for the water it has impounded, both as a means of earning income and also to increase its political leverage in the region.¹²⁴ Most of these proposals involve variations of what has come to be called the "Peace Pipeline."¹²⁵ This proposal, in its most ambitious form, would provide as much as 6 MCM daily to be piped as far as Jeddah and Mecca in Saudi Arabia (1.5 MCM) in a western branch and as far as Bahrain and Qatar (2.5 MCM) in a eastern branch.¹²⁶

The Peace Pipeline proposal is based upon the conclusion that the water facilities already in place in Turkey—principally the Atatürk

122. Kolars, *supra* note 11, at 108.

123. *Id.*, at 118.

124. *Id.*, at 119.

125. See generally BEAUMONT, BLAKE, & WAGSTAFF, *supra* note 3, at 84; HILLEL, *supra* note 2, at 243-46; KLIOT, *supra* note 2, at 131-37, 163; Cem Duna, *Turkey Peace Pipeline*, in THE POLITICS OF SCARCITY: WATER IN THE MIDDLE EAST 119 (Joyce Starr & Daniel Stoll eds. 1988); George Gruen, *Contribution of Water Imports to Israeli-Palestinian-Jordanian Peace*, in WATER AND PEACE, *supra* note 14, at 273, 280-84; Chris Hellier, *Draining the Rivers Dry*, GEOGRAPHICAL MAG. 32, 34-35 (July 1990); Kolars, *supra* note 11, at 117; Hillel Shuval, *Approaches to Resolving the Water Conflicts between Israel and her Neighbors—A Regional Water-for-Peace Plan*, 17 WATER INT'L 133, 139-41 (1992); Itar Turan, *Turkey and the Middle East: Problems and Solutions*, 18 WATER INT'L 23, 26-27 (1993); Wachtel, *supra* note 14. For a wide-ranging criticism of the project, see Manuel Schiffler, *Sustainable Development of Water Resources in Jordan: Ecological and Economic Aspects in a Long-Term Perspective*, in LEGAL, POLITICAL AND COMMERCIAL IMPLICATIONS, *supra* note 13, at 239, 251.

126. HILLEL, *supra* note 2, at 246; Gruen, *supra* note 125, at 281.

Dam—will develop more water than can be consumed in Turkey without interfering with the equitable shares of Iraq and Syria. Turkish estimates of the amount of water exploitable from all drainage basins in Turkey is about 96 BCM, a figure that still allows Turkey to consume about five times as much water *per capita* as current levels of consumption, even assuming that Turkey's population grows above 80,000,000 by 2010.¹²⁷ These figures allow a fairly confident prediction of as much as 43 BCM as "surplus" water, available for export annually.¹²⁸

Any version of the Peace Pipeline depends on Syria's on-going cooperation.¹²⁹ This is unlikely unless on-going incentives for Syrian cooperation are built into the arrangement.¹³⁰ This perhaps explains why the Turkish planners expected to deliver 1.1 MCM (18%) to Syrian cities out of 6 MCM to be pumped daily through the pipeline under the most ambitious proposal.¹³¹ Less ambitious proposals for a pipeline from Turkey only to the Jordan Valley also include substantial deliveries to the Syrians (275 MCM out of 1.1 BCM annually).¹³² In addition, Syria could generate hydroelectric power from the fall of the pipeline as it crosses Syrian territory, perhaps as much as 200 megawatts.¹³³ An Israeli analyst, Hillel Shuval, has gone so far as to propose that the pipeline provide water only to Syria, on the assumption that water could then be released from Syrian diversions from the Yarmuk River would satisfy Jordanian and Palestinian needs.¹³⁴

127. Gruen, *supra* note 125, at 280. See generally BEAUMONT, BLAKE, & WAGSTAFF, *supra* note 3, at 84; KLIOT, *supra* note 2, at 133-37.

128. Gruen, *supra* note 125, at 280; Kolars, *supra* note 11, at 117.

129. "Medusa bags"—enormous plastic bags filled with water—have been suggested as a means for carrying the water from a Turkish port to an Israeli port, and thus literally circumventing the Syrian problem. This proposal seems simply too expensive to be taken seriously. See HILLEL, *supra* note 2, at 250-51; KLIOT, *supra* note 2, at 133, 240; Gruen, *supra* note 125, at 282-84; Hugh Pope, *Water in a Bag*, 8 MIDDLE EAST INT'L 14 (1990). See also Turan, *supra* note 125, at 27 (describing a plan to transport water to Israel by tanker). For a more optimistic estimate, see Elisha Kally, *Costs of Inter-Regional Conveyance of Water and Costs of Sea Water Desalination*, in WATER AND PEACE, *supra* note 14, at 289, 292-95.

130. See generally ROBERT KEOHANE, INTERNATIONAL INSTITUTIONS AND STATE POWER 167 (1989); Eyal Benvenisti, *Legal Aspects of International Institutions for the Management of Shared Water Resources*, in JOINT MANAGEMENT OF SHARED AQUIFERS: THE FIRST WORKSHOP 72, 75-77 (Eran Feitelson & Marwan Haddad eds. 1994); Robert Powell, *Absolute and Relative Gains in International Relations Theory*, 84 AM. POLI. SCI. REV. 1303 (1991).

131. KLIOT, *supra* note 2, at 133; Duna, *supra* note 125, at 120; Gruen, *supra* note 125, at 281.

132. KOLARS & MITCHELL, *supra* note 14, at 90; Gruen, *supra* note 125, at 282; Wachtel, *supra* note 14, at 363, 365, 368-69, 373.

133. Wachtel, *supra* note 14, at 368.

134. Shuval, *supra* note 125, at 140.

Despite Turkey's plans for exploiting the Euphrates and even without the Peace Pipeline, Syria will receive enough water for its current plans so long as Syria feels free to disregard any obligation to deliver adequate amounts of water to Iraq.¹³⁵ With so much of the water to be used for irrigation in Turkey, however, Syria will likely face severe degradation of water quality in the Euphrates and in the tributaries that feed into the Euphrates in Iraq.¹³⁶ And with its population currently growing at a rate that will double it every 18 years,¹³⁷ even the quantity of water available to Syria could well prove problematic in the not very distant future.

The dependence of the project on Syrian as well as Turkish good will perhaps explains why Saudi Arabia and the Gulf States have proven distinctly uninterested in the Peace Pipeline proposal.¹³⁸ With their disinterest, financing the project becomes problematic except perhaps as part of the overall Middle East peace process. Even then, the project yet again takes water out of the Euphrates, threatening Iraq with no compensating benefits that could alleviate Iraqi concerns. Even if, as has been suggested, the water to be exported were to be drawn from the Ceyhan and Seyhan Rivers or even from other rivers, rather than directly from the Euphrates, that arrangement would not seriously relieve Iraqi fears as Euphrates water would probably be used directly or indirectly to replace the exported water.¹³⁹ Furthermore, water sources that might serve as alternatives to the Euphrates would require so much more pumping than the higher Atatürk Dam that these sources would probably not be economically feasible.¹⁴⁰ For now, the grander version of the peace pipeline seems stillborn; it remains to be seen whether the more modest proposal to export water to the Jordan Valley will be realized.

135. Kolars, *supra* note 11, at 115-16.

136. WATER IN THE MIDDLE EAST, *supra* note 1, at 87-89, 97; Kolars, *supra* note 11, at 115.

137. Kolars, *supra* note 11, at 115.

138. HILLEL, *supra* note 2, at 246; Jamil al-Alawi & Mohammed Abdulrazzak, *Water in the Arabian Peninsula: Problems and Perspectives*, in WATER IN THE ARAB WORLD, *supra* note 2, at 171, 196-97; Gruen, *supra* note 125, at 282; Tvedt, *supra* note 8, at 19.

139. KLIOT, *supra* note 2, at 132; Gruen, *supra* note 125, at 282-83; Wachtel, *supra* note 14, at 365-67.

140. Wachtel, *supra* note 14, at 366.

IV. THE LAW OF THE RIVERS

The entire basin of the Euphrates and most of the basin of the Tigris became part of the Ottoman Empire early in the sixteenth century and remained under Ottoman rule until 1918.¹⁴¹ During this time, there could be no international disputes over the Euphrates, and, given the modest scale of usage, there appear to have been few or no international disputes between the Ottoman and Safavid Empires (modern Turkey and Iran) regarding use of the Tigris River. Although several treaties that attempted to define the boundary between the Ottomans and the Safavids between 1847 and 1914 did deal, though not altogether clearly, with a boundary line in the Shatt al-'Arab itself, even these treaties were not concerned with consumptive uses of water.¹⁴²

The British conquered Mesopotamia during World War I; after the war, the region was partitioned between a British Mandate over Iraq, a French Mandate over Syria, and a residual portion left to Turkey. This was the origin of the present state structure in the basin. This section examines the several efforts to remedy this lack either through customary international law or through negotiation and agreement among the several interested states. First, I will explain the background of arguably controlling agreements that emerged between the end of World War I and the dispute over the Tabqa Dam, and show why those agreements fail to prevent or resolve disputes over the shared waters of the basin. Second, I shall discuss the customary international law governing consumptive uses of transboundary waters, describe the general practices described as customary international law in this regard, and examine the customary law as developed in the disputes over the waters of the two rivers of the Mesopotamian basin.

141. Kaiyan Homi Kaidobad, *The Shatt-al-Arab River Boundary: A Legal Reappraisal*, 56 BRIT. Y.B. INT'L L. 49, 52 (1988).

142. *Protocol of Constantinople*, signed Nov. 17, 1913, Persia-Turkey, reprinted in (Iraqi) Ministry of Foreign Aff., *Iraqi Letter to the Secretary-General*, Nov. 29, 1934, 1935 LG. NAT. O.J. 16, App. 2 ("Iraqi Letter"); *Treaty of Erzerum*, reprinted in 101 CLIVE PARRY, CONSOLIDATED TREATY SERIES 86; & in *Iraqi Letter*, *supra*, App. 1. See generally CAPONERA, *supra* note 7, at 202-04; WATER IN THE MIDDLE EAST, *supra* note 2, at 101-06, 176-77; C.J. Edmonds, *The Iraqi-Persian Frontier: 1639-1938*, 62 ASIAN AFF. 147 (1975); Kaidobad, *supra* note 39; Elihu Lauterpacht, *River Boundaries: Legal Aspects of the Shatt al Arab Frontier*, 9 INT'L & COMP. L.Q. 208 (1960); Alexander Melamid, *The Shatt al-'Arab Boundary Dispute*, 22 MIDDLE EAST J. 351 (1968); Daniel Pipes, *A Border Adrift: Origin of the Conflict*, in THE IRAN-IRAQ WAR: NEW WEAPONS, OLD CONFLICTS 13 (S. Tahir-Kheli & S. Ayubi eds. 1983).

A. *Treaties before Active Disputes Began: 1918-1974*

Even after the division of Mesopotamia among three states, no serious disputes arose until Syria announced its plans for the Tabqa Dam.¹⁴³ Prior to that time, the uses of the several states simply were not sufficiently competitive for them to codify their relationships regarding, or seriously dispute the rights to, the water. The dispute between Iraq and Syria over the Tabqa Dam focused attention on the law of the rivers in a way never before attempted. The Turkish projects and proposals have further accentuated this attention.

During the Mandate period, the British and the French included promises to consult over their uses of the rivers, and established a consultative committee for this purpose.¹⁴⁴ France and Turkey reached an agreement in 1921 in which each promised to use only an equitable share of the available water, but that agreement only pertained to the Kuveik River which flows from Turkey to northwestern Syria, disappearing into the desert without reaching the sea.¹⁴⁵ The same agreement authorized the city of Aleppo in Syria to "organize, at its own expense," a water supply from the Euphrates in Turkey.¹⁴⁶ A treaty signed by France and Turkey in 1926 was no more specific.¹⁴⁷ The Commission on the Delimitation of the Turkish-Syrian Frontier simply declared that "[a]ll questions [relating to the Tigris River], such as navigation, fishing, industrial and agricultural utilization of the waters, and the policing of the river, shall be resolved on the basis of complete equality."¹⁴⁸ Rather than establishing a regime for the twin rivers, these highly general agreements signaled the utter lack of interest in either Syria or Turkey in developing the waters of the Euphrates and the Tigris at that time.¹⁴⁹

143. KLIOT, *supra* note 2, at 161. For the Tabqa Dam dispute, see the text *supra* at notes 80-86.

144. *Convention on Certain Points Connected to the Mandates of Syria, the Lebanon, Palestine, and Mesopotamia*, signed Dec. 23, 1920, France-United Kingdom, art. 3, 22 L.N.T.S. 353. See Chalabi & Majzoub, *supra* note 13, at 193.

145. *Agreement with a View to Promoting Peace*, signed Oct. 20, 1921, France-Turkey, art. 12, 14 L.N.T.S. 177. See Chalabi & Majzoub, *supra* note 13, at 193, 195-96.

146. *Agreement*, *supra* note 143, art. 13.

147. *Treaty of Friendship and Good Neighborliness*, signed May 30, 1926, France-Turkey, art. 13, 56 L.N.T.S. 194. See Chalabi & Majzoub, *supra* note 13, at 193.

148. *Final Demarcation Protocol of Commission on the Turco-Syrian Frontier*, signed May 3, 1930, France-Turkey, cl. 2, UNITED NATIONS, LEGISLATIVE TEXTS AND TREATY PROVISIONS CONCERNING THE UTILIZATION OF INTERNATIONAL RIVERS FOR OTHER PURPOSES THAN NAVIGATION, no. 94, ST/LEG/SER.B/12 (1964) ("LEGISLATIVE TEXTS"). See Chalabi & Majzoub, *supra* note 13, at 193-94.

149. Hager, *supra* note 2, at 214; Waterbury, *supra* note 49, at 56.

At a time when Syria and Turkey had no interest in developing the waters of Mesopotamia, Iraq was vitally interested. This pattern gave rise to two treaties between Iraq and Turkey, one in 1930 (while Iraq was still under the British mandate) in which each promised not to change the flow of the Euphrates without the consent of the other, and the second in 1946 (after the Mandate ended) reaffirming the earlier agreement.¹⁵⁰ Turkey promised not to alter the rivers without informing Iraq, and to conform its works to the needs of the both states "as far as possible."¹⁵¹ Turkey consented to Iraq's construction of dams in Turkey to regulate the flow of the rivers in Iraq.¹⁵² Arguably, the effect of these treaties was Turkish acceptance of Iraq's vested right to receive its then established uses, about 13 BCM.¹⁵³

These treaties gradually fell in desuetude. Iraq never constructed the works in Turkey that the 1946 treaty had anticipated, perhaps because Iraq was unwilling to have its major water control facilities located outside its borders.¹⁵⁴ A meeting of representatives of the three states in 1965 signaled only the demise of the treaty system.¹⁵⁵ In follow-up bilateral talks, Syria expressly rejected any recognition of vested rights by Iraq.¹⁵⁶ No new agreement replaced the earlier treaties. Thereafter, each state began to construct new works without the consent of the other parties.

The two consultative committees continued to meet intermittently, and eventually, in 1983, the two consultative committees were merged into a Trilateral Commission on the Tigris and the Euphrates.¹⁵⁷ That Commission, which has only met sporadically, has been strictly limited to technical matters. None of the three states has attempted to involve the Trilateral Commission in their political disputes relating to the Euphrates or to the Tigris.¹⁵⁸

Between 1946 and 1990, the three states did not enter into any formal treaty relative to their shared waters. With the apparent abandonment of any claims they might have had under the earlier treaties,

150. *Protocol Relative to the Regulation of the Waters of the Tigris and Euphrates*, signed Mar. 29, 1946, Iraq-Turkey, art. 4, 37 U.N.T.S. 280. See Chalabi & Majzoub, *supra* note 13, at 194-95.

151. *Protocol*, *supra* note 150, art. 5.

152. *Id.*, art. 6.

153. Waterbury, *supra* note 49, at 56. See also Hager, *supra* note 2, at 214-15.

154. Waterbury, *supra* note 49, at 56.

155. *Id.*; Bari, *supra* note 42, at 238.

156. Waterbury, *supra* note 49, at 56-57.

157. KLIOT, *supra* note 2, at 162; Gruen, *supra* note 20, at 100; Waterbury, *supra* note 49, at 57.

158. Gruen, *supra* note 20, at 100-01; Joffé, *supra* note 20, at 76.

the states have, in fact, no formal agreement allocating the waters of the two rivers.¹⁵⁹ As we shall see, the claims, discussions, and recriminations that make up the customary international law process have given rise to several informal agreements. Whether these will provide a more stable region for the waters of the basin remains to be seen.

B. *The Customary International Law of Transboundary Waters*

International law is in many respects still a relatively primitive legal system, i.e. a system that mostly lacks centralized institutional structures for law-making and law-enforcing, relying instead on the decentralized processes of self-help, agreement, and custom.¹⁶⁰ The system of international law in fact is so primitive that some question whether it deserves to be called law at all.¹⁶¹ This question only arises when people have a very specific model of how law works when they describe something as a legal right or obligation.¹⁶² This model envisions a legislative act formally creating a highly determinate rule enforced by a policeman on the corner who will "take you in" if you violate the "law." However, this model does not go very far in explaining how "law" actually works.

Consider mundane examples of traffic laws. In the United States, nearly everyone drives faster than the legal speed limit and there could never be enough police to compel people to drive at or below the legal limit. In fact, if the government ever attempted to strictly enforce the speed limit, it would fail simply because too many people are breaking the law. The best the government can do is to keep most people driving enforce the limits on a case-by-case basis through selective enforcement targeted particularly at those who drive very fast.¹⁶³ In spite of this enforcement procedure, however, it is difficult to imagine that one would be allowed to defend their speeding to a judge on the basis that the law

159. KLIOT, *supra* note 2, at 161. See also WATER IN THE MIDDLE EAST, *supra* note 1, at 99.

160. H.L.A. HART, THE CONCEPT OF LAW 77-96 (1961); MARK JANIS, AN INTRODUCTION TO INTERNATIONAL LAW 45-46 (1988); WATER IN THE MIDDLE EAST, *supra* note 1, at 157-60; Yoram Dinstein, *International Law as a Primitive Legal System*, 19 INT'L L. & POLITICS 1 (1986).

161. The question was apparently first asked in the nineteenth century by John Austin. JOHN AUSTIN, THE PROVINCE OF JURISPRUDENCE DETERMINED 122-25 (H.L.A. Hart ed. 1955).

162. See generally Robert MacLean, *Does Anyone Still Ask the Question: "Is International Law Really Law?"*, 1991 JURIDICAL REV. 230.

163. See Note, *Laws That Are Made to Be Broken: Adjusting for Anticipated Noncompliance*, 75 MICH. L. REV. 687 (1977).

is not effectively enforced or that the designated speed limit is not the law.

Contrast the situation regarding traffic lights. If nearly every one were to disregard traffic signals, the laws proscribing driving through red lights could no more be enforced than the speed limits. Yet people in the United States seldom drive through red lights, even though many people often cheat a little. When only a few violate a rule, a small number of police are adequate to enforce the rule against the violators. The reason most people do not drive through red lights is self-evident: To drive through a red light is more dangerous than speeding, and would be suicidal if nearly every one did so. Yet one's emotional response to another's driving through a red light is not simply that it is dangerous. Most people perceive it as anti-social behavior; they condemn it as illegal, and not simply as stupid.

This social sense of legitimacy makes true law—even in paradigm situations of clear rules and vigorous official enforcement, more so than John Austin's "command of a sovereign" or any ensuing enforcement.¹⁶⁴ As A.L. Goodhart stated, "It is because a rule is regarded as obligatory that a measure of coercion may be attached to it; it is not obligatory because there is coercion."¹⁶⁵ H.L.A. Hart's notion of law as growing out of a "habit of obedience"¹⁶⁶ seems inadequate to capture this sense of legitimacy, but it is closer to the reality of what makes for law than the notion of command or sanction that are often thought to constitute "the law."¹⁶⁷

International law operates on much the same basis, but without the superstructure of specialize institutions—executive, legislative, and judicial—with which we are familiar in modern national legal systems. This lack has led some to believe that the international system does not have law. The conclusion confuses particular institutional arrangements with what law really is and how it really operates. Those institutions are have proven useful, and perhaps even necessary, in large communities, and corresponding institutions may yet have to be developed in an international system with increasing numbers of states and other participants. Yet the absence of those institutions no more indicates an

164. AUSTIN, *supra* note 161, at 133, 201. This notion of law can be traced back at least as far as Hobbes in the seventeenth century. See THOMAS HOBBS, *LEVIATHAN* (1651).

165. A.L. GOODHART, *LAW AND THE MORAL LAW* 17 (1953). See also HART, *supra* note 160, at 20-25.

166. See HART, *supra* note 160, at 77-96.

167. See generally G.G. Fitzmaurice, *The Foundations of the Authority of International Law*, 19 MOD. L. REV. 1 (1956).

absence of law in the international system than the absence of those institutions indicated the lack of law in pre-industrial societies the world over.¹⁶⁸

In the absence of formal treaty, international law arises through a process of claim and counter-claim that produces an explicit or implicit agreement of the participants to the controversy.¹⁶⁹ If nothing more were involved, one might well question whether we were talking about anything that could properly be termed law. States on both sides of a controversy, however, will refer to international law as a primary justification of their claims and their practices. Foreign ministries and diplomats know very well the difference between appeals to law and appeals to morality, and they often express this difference at appropriate points in their discourse.¹⁷⁰ This reference to law ties the customary practice to a sense of legitimacy, and constitutes the practice as law in a highly decentralized and institutionally undeveloped system like international law or, for that matter, customary law among substance farmers or nomadic tribesmen.¹⁷¹ A consistent pattern of behavior joined with the sense that the practice is legally obligatory (the *opinio juris*) is what international lawyers mean by saying that a pattern of state behavior has become customary international law.¹⁷²

168. MICHAEL BARKUN, *LAW WITHOUT SANCTIONS* (1968); VICTOR LI, *LAW WITHOUT LAWYERS* (1978); Cornelius Murphy, *Some Reflections upon Theories Concerning the Nature of Law*, 70 COLUM. L. REV. 447 (1970).

169. WATER IN THE MIDDLE EAST, *supra* note 1, 158-162, 167. The classic description of this process is found in Myres McDougal & Norbert Schlei, *The Hydrogen Bomb Test in Perspective: Lawful Measures for Security*, 64 YALE L.J. 648 (1955). See also CHARLES DE VISSHER, *THEORY AND REALITY IN INTERNATIONAL LAW* (1968).

170. A point made by H.L.A. Hart more than 30 years ago. See HART, *supra* note 160, at 222-225.

171. See 1 PITT COBBET, *CASES ON INTERNATIONAL LAW* 5 (1922); DE VISSHER, *supra* note 169, at 149. See also IAN BROWNLIE, *PRINCIPLES OF PUBLIC INTERNATIONAL LAW* 31-32 (4th ed. 1990); ANTHONY D'AMATO, *THE CONCEPT OF CUSTOM IN INTERNATIONAL LAW* 51, 88 (1971); HART, *supra* note 160, at 77-96; KAROL WOLFKE, *CUSTOM IN PRESENT INTERNATIONAL LAW* 52-56, 160-68 (2d rev. ed. 1993); Martti Koskenniemi, *The Normative Force of Habit: International Custom and Social Theory*, 1 FINN. Y.B. INT'L L. 77 (1990).

172. *Statute of the International Court of Justice*, art. 38(1)(b), 59 Stat. 1055, T.S. 993 (1945) ("*ICJ Statute*"); J.L. BRIERLY, *THE LAW OF NATIONS* 60 (Sir Humphrey Waldock ed. 1963). See generally BROWNLIE, *supra* note 171, at 4-11; D'AMATO, *supra* note 171; JANIS, *supra* note 160, at 35-46; HERSCH LAUTERPACHT, *THE DEVELOPMENT OF INTERNATIONAL LAW BY THE INTERNATIONAL COURT* 368-93 (1958); RESTATEMENT (THIRD) OF FOREIGN RELATIONS LAW OF THE UNITED STATES § 102 (Louis Henkin, Andreas Lowenfeld, & Detlev Vagts reporters 1987); G.I. TUNKIN, *THEORY OF INTERNATIONAL LAW* 89-203 (William Butler trans. 1974); 1 J.H.W. VERZIJL, *INTERNATIONAL LAW IN HISTORICAL PERSPECTIVE* 31-47 (1968).

Customary international law frequently remains ill-defined and uncertain, as is true of all customary law.¹⁷³ Proving that a practice has crystallized as customary international law and the precise content of any such custom is difficult, requiring research into the professed reasons for state practices in often obscure sources. For this reason, states and international tribunals often have recourse to the learning of leading scholars (termed "the most highly qualified publicists" in the Statute of the International Court of Justice) to discover the actual customary international law.¹⁷⁴ There are numerous sources of state practice and of evidence of the reasons for that practice. A widespread pattern of treaties or other international agreements demonstrate not only the agreement of the specific parties, but also that the practice is so widely followed that it has become a rule of customary law binding even on states that are not parties to any such treaty.¹⁷⁵ One might also find votes in international assemblies¹⁷⁶ or decisions by international courts or international arbitrators¹⁷⁷ equally useful. Even unilateral actions of states demonstrate that a particular state embraces a particular customary rule of law.¹⁷⁸

Yet even when a norm of customary international law has been determined with some certainty, customary forms of enforcement—claim and counterclaim among states—are not neutral enforcement mechanism. Without a neutral enforcement mechanism, one always suspects that national interest overrides any real commitment to law. Without a neutral enforcement mechanism, international law ultimately has nothing better

173. See, e.g., MARC BLOCH, *FEUDAL SOCIETY* 114 (L.A. Manyon trans. 1961); ERIC HAVELOCK, *PREFACE TO PLATO* 121-22 (1963); FRITZ KERN, *KINGSHIP AND LAW IN THE MIDDLE AGES* 179 (S.B. Chimes trans. 1939); Ronald Collins & David Skover, *Paratexts*, 44 *STAN. L. REV.* 509, 516-21 (1992).

174. *ICJ Statute*, *supra* note 172, art. 38(1)(d). See generally BROWNLIE, *supra* note 171, at 24-25; JANIS, *supra* note 160, at 66-69; LAUTERPACHT, *supra* note 172, at 23-25.

175. See BROWNLIE, *supra* note 171, at 11-14; JANIS, *supra* note 160, at 41-42; MYRES MCDUGAL, HAROLD LASSWELL, & IVAN VLASIC, *LAW AND PUBLIC ORDER IN SPACE* 82-82, 115-19 (1963); A.D. MCNAIR, *THE LAW OF TREATIES* 216-18 (1961); JULIUS STONE, *LEGAL CONTROLS IN INTERNATIONAL LAW* 135 (1954); Grigory Tunkin, *Is General International Law Customary Law Only?*, 4 *EUR. J. INT'L L.* 534 (1993).

176. BROWNLIE, *supra* note 171, at 14-15, 30-31; BLAINE SLOAN, *UNITED NATIONS GENERAL ASSEMBLY RESOLUTIONS IN OUR CHANGING WORLD* (1991); Christopher Joyner, *U.N. General Assembly Resolutions and International Law: Rethinking the Contemporary Dynamics of Norm-Creation*, 11 *CAL. W. INT'L L.J.* 445 (1981); Ignaz Seidl-Hohenveldern, *International Economic "Soft-Law"*, 163 *HAGUE RECUEIL DES COURSES* 165, 194-213 (1979).

177. BROWNLIE, *supra* note 171, at 19-24; JANIS, *supra* note 160, at 66-69; LAUTERPACHT, *supra* note 172, at 1-25; SHABTAI ROSENNE, 2 *THE LAW AND PRACTICE OF THE INTERNATIONAL COURT* 611-13 (1965); Michael Akehurst, *The Hierarchy of Sources in International Law*, 47 *BRIT. Y.B. INT'L L.* 273 (1975).

178. BROWNLIE, *supra* note 171, at 5; JANIS, *supra* note 160, at 38-43.

to offer for punishing violations than the law of the vendetta.¹⁷⁹ Despite its institutional primitiveness, however, customary international law has worked fairly well when there were only a few participants in the international community and their wants were relatively simple and straightforward. That continues today in the many areas in which customary international law operates without controversy.¹⁸⁰ Customary international law continues to empower international actors by legitimating their claims while also limiting the claims they can make. The institutional primitiveness of international law has always been felt most seriously during periods of major crisis, a problem that also continues today.¹⁸¹

In coupling of a recognized mode of expert analysis with woefully inadequate institutional development, customary international law has become seriously unbalanced. The "most highly qualified publicists" who figure so prominently in international legal processes often devise doctrinal schemes of considerable sophistication without being able to translate those schemes into effective institutional arrangements. Diplomats and politicians, responsible for crafting institutional arrangements, have had predictably mixed results, rarely succeeding in institution building through customary processes. A fully developed institutional framework is essential for any region facing increasingly desperate water shortages.¹⁸² Institution builders, to get beyond the limits of custom, must combine the sophisticated insights of international lawyers with the practical structures created by political actors through treaties creating institutions appropriate for managing cooperative activities and for resolving conflict before it escalates to injurious levels.

179. WATER IN THE MIDDLE EAST, *supra* note 1, at 161. See also Richard Bilder, *Some Limitations of Adjudication as an International Dispute Settlement Technique*, 23 VA. J. INT'L L. 1 (1982); Richard Falk, *The Beirut Raid and the International Law of Retaliation*, 63 AM. J. INT'L L. 415 (1969).

180. See generally LOUIS HENKIN, *HOW NATIONS BEHAVE* 25-26, 47, 89-98, 320-21 (2d ed. 1979); Ian Brownlie, *The Reality and Efficacy of International Law*, 52 BRIT. Y.B. INT'L L. 1 (1981). For a study of customary law in a domestic setting relating to water, see Sanford Clark, *Tensions between Water Legislation and Customary Rights*, 30 NAT. RESOURCES J. 503 (1990).

181. HANS MORGANTHAU, *POLITICS AMONG NATIONS* 282 (4th ed. 1967); Richard Falk, *The Adequacy of Contemporary Theories of International Law—Gaps in Legal Thinking*, 50 VA. L. REV. 231 (1964).

182. See generally Dellapenna, *Designing Legal Structures*, *supra* note 1, at 93-103; Dellapenna, *Jordan Valley*, *supra* note 1, at 40-45; Dellapenna, *Treaties*, *supra* note 1, at 51-56; Northcutt Ely & Abel Wolman, *Administration*, in *THE LAW OF INTERNATIONAL DRAINAGE BASINS* 124 (Albert Garretson, Robert Hayton, & Cecil Olmstead eds. 1967) ("INTERNATIONAL DRAINAGE BASINS"); TECLAFF, *supra* note 2, at 113-203.

In short, customary international law, by itself, is unable to solve such contentious problems as the managing of transboundary water resources.¹⁸³ Yet even for the managing of transboundary water resources, the pattern of state claim and counterclaim, and of state behavior intended to make such claims remains consistent, and of ultimate outcomes is, in general terms, entirely predictable,¹⁸⁴ even though all states agree on only one point: Only riparian states—states along the boundary of which, or through which, a river flows—have any legal right, absent agreement, to use the water of a river.¹⁸⁵ Otherwise, the patterns of international claim and counterclaim initially diverge sharply according to the riparian status of the state making the claim.

The uppermost-riparian state initially claims “absolute territorial sovereignty”,¹⁸⁶ typically claiming the right to do whatever it chooses

183. See Dellapenna, *Designing Legal Structures*, *supra* note 1, at 85-90; Joseph Dellapenna, *Surface Water in the Iberian Peninsula: An Opportunity for Cooperation or a Source of Conflict?*, 59 TENN. L. REV. 803, 814-22 (1992); Dellapenna, *Jordan Valley*, *supra* note 1, at 37-40; Dellapenna, *Treaties*, *supra* note 1, at 33-42.

184. For illustrative works on the law of transboundary surface waters, see Int'l L. Comm'n, *Draft Articles on the Law of Non-Navigational Use of International Watercourses* (“Draft Articles”), art. 4, in REPORT OF THE 46TH MEETING OF THE INTERNATIONAL LAW COMMISSION, 2 MAY - 22 JULY, 1994, A/49/10 (“ILC REPORT”), at 195; BERBER, *supra* note 7; BRIERLY, *supra* note 172, at 231-32; BROWNLIE, *supra* note 171, at 271-76; J. BRUHÀCS, *THE LAW OF NON-NAVIGATIONAL USES OF INTERNATIONAL WATERCOURSES* (1993); CAPONERA, *supra* note 7, at 189-90, 212-14; BRIJ CHAUHAN, *SETTLEMENT OF WATER LAW DISPUTES IN INTERNATIONAL DRAINAGE BASINS* (1981); BONAYA ADHI GODANA, *AFRICA'S SHARED WATER RESOURCES: LEGAL AND INSTITUTIONAL ASPECTS OF THE NILE, NIGER, AND SENEGAL RIVER SYSTEMS* 32-35 (1985); 1 LASSA OPPENHEIM, *INTERNATIONAL LAW* 313, 345-47, 474-476 (Hersch Lauterpacht ed., 8th ed. 1955); H.A. SMITH, *THE ECONOMIC USES OF INTERNATIONAL RIVERS* (1931); TECLAFF, *supra* note 8; Eyal Benvenisti & Haim Gvirtzman, *Harnessing International Law to Determine Israeli-Palestinian Water Rights: The Mountain Aquifer*, 33 NAT. RESOURCES J. 543 (1993); Richard Bilder, *International Law and Natural Resources Policies*, 20 NAT. RESOURCES J. 452 (1980); Chalabi & Majzoub, *supra* note 13; Jan Hostie, *Problems of International Law Concerning Irrigation of Arid Lands*, 31 INT'L AFFAIRS 61 (1955); Jerome Lipper, *Equitable Utilization*, in INTERNATIONAL DRAINAGE BASINS, *supra* note 182, at 18; Tiyanjana Maluwa, *Towards an Internationalisation of the Zambezi River Regime: The Role of International Law in the Common Management of an International Watercourse*, 25 COMP. & INT'L L.J. S. AFR. 20 (1992); Stephen Schwebel, *The Law of Non-Navigational Uses of International Watercourses*, U.N. Doc. A/CN.4/348, [1982] II Y.B. INT'L L. COMM'N 73, 76-82; Albert Utton, *International Streams and Lakes Generally*, in 5 WATERS AND WATER RIGHTS, ch. 49 (Robert Beck ed. 1991); Patricia Wouters, *Allocation of the Non-Navigational Uses of International Watercourses: Efforts at Codification and the Experience of Canada and the United States*, 30 CAN. Y.B. INT'L L. 43, 45 (1992); Sheng Yu, *International Rivers and Lakes*, in INTERNATIONAL LAW: ACHIEVEMENTS AND PROSPECTS 989, 990 (Mohammed Bedjaoui ed. 1991).

185. *Draft Articles*, *supra* note 184, art. 4; WATER IN THE MIDDLE EAST, *supra* note 1, at 166-167.

186. BERBER, *supra* note 7, at 14-19, 77-78, 108; BRUHÀCS, *supra* note 184, at 41-47; CAPONERA, *supra* note 7, at 212-13; GODANA, *supra* note 184, at 32-35 (1985); WATER IN THE MIDDLE EAST, *supra* note 1, at 164-165; Lipper, *supra* note 184, at 20-23; Maluwa, *supra*

with the water regardless of its effect on other riparian states. Downstream states generally open by claiming a right to the "absolute integrity of the river",¹⁸⁷ claiming that upper-riparian states can do nothing that affects the quantity or quality of water that flows down the watercourse. Of course, neither claim can prevail, although the process of negotiating or otherwise arriving at a solution could require decades.

The usual solution is found in a concept of "restricted sovereignty".¹⁸⁸ States that find themselves to be both upper and lower riparians on the same stream (usually relative to different states) often are the first to adopt a theory of restricted sovereign rights under which each state recognizes the right of all riparian states to use some water from a common source and the obligation to manage their uses so as not to interfere with like uses in other riparian states. States often allocate water under this theory according to some selected historic pattern of use, although occasionally some other more or less objective measure of need is advanced (population, area, arable land, etc.).¹⁸⁹ At the extreme, the

note 184, at 25-26; Stephen McCaffrey, *Second Report on the Law of Non-Navigational Uses of International Watercourses*, U.N. Doc. A/CN.4/348, [1986] II Y.B. INT'L L. COMM'N 88, 105-10; Utton, *supra* note 184, § 49.02(1); Yu, *supra* note 184, at 990. Probably the best known expression of this theory is in a published opinion by U.S. Attorney-General Judson Harmon, 21 Op. Att'y Gen. 274, 281-282 (1898). The "Harmon Doctrine" has been disapproved by the U.S. State Department, Memorandum to the Legal Advisor, Nov. 23, 1942, in 3 MARJORIE WHITEMAN, *DIGEST OF INTERNATIONAL LAW* 950-954 (1964).

187. BERBER, *supra* note 7, at 19-22; BRUHÀCS, *supra* note 184, at 43-47; CAPONERA, *supra* note 7, at 213; GODANA, *supra* note 184, at 38-39; WATER IN THE MIDDLE EAST, *supra* note 1, at 165; A.P. Lester, *River Pollution in International Law*, 57 AM. J. INT'L L. 828, 832 (1963); Lipper, *supra* note 184, at 18-20; Maluwa, *supra* note 184, at 24-25; Utton, *supra* note 184, § 49.02(2); Yu, *supra* note 184, at 990.

188. BERBER, *supra* note 7, at 11-14, 78-79; BRUHÀCS, *supra* note 184, at 45-48; CAPONERA, *supra* note 7, at 213-14; GODANA, *supra* note 184, at 40; WATER IN THE MIDDLE EAST, *supra* note 1, at 165-166; William Bush, *Compensation and the Utilization of International Rivers and Lakes: The Role of Compensation in the Event of Permanent Injury to Existing Uses of Water*, in THE LEGAL REGIME OF INTERNATIONAL RIVERS AND LAKES 309 (Ralph Zacklin & Lucius Cafilisch eds. 1981); Lipper, *supra* note 184, at 23-38; Maluwa, *supra* note 184, at 26-30; McCaffrey, *supra* note 186, at 110-33; Utton, *supra* note 184, § 49.02(3); Yu, *supra* note 184, at 991.

189. See, e.g., *Agreement on the Full Utilization of the Nile Waters*, signed Nov. 8, 1959, United Arab Rep.-Sudan, 453 U.N.T.S. 51; *Convention Concerning the Management of the Chute of the Doubs near Chatelot*, signed Nov. 19, 1930, France-Switzerland, UNITED NATIONS, LEGISLATIVE TEXTS AND TREATY PROVISIONS CONCERNING THE UTILIZATION OF INTERNATIONAL RIVERS FOR OTHER PURPOSES THAN NAVIGATION no. 199, ST/LEG/SER.B/12 (1964) ("LEGISLATIVE TEXTS"); *Convention for the Development of the Water Power of the Rhône River*, signed Oct. 4, 1913, France-Switzerland, LEGISLATIVE TEXTS, *supra*, no. 197; *Convention Providing for the Equitable Distribution of the Waters of the Rio Grande for Irrigation Purposes*, signed May 21, 1906, Mexico-United States, 34 Stat. 2953; *Convention to Regulate the Hydro-Electric Development of the International Section of the River Duoro*, signed Aug. 11, 1927, Spain-Portugal, 82 L.N.T.S. 133; *Indus Waters Treaty*, signed Sept. 19, 1960, India-Pakistan, 419 U.N.T.S. 126; *Treaty Relating to the Uses of the Waters of the*

theory of restricted sovereignty might be no more developed than the vague notion that each state is entitled to a "reasonable share" of the water.¹⁹⁰

Restricted sovereignty has become the customary rule of international law under the rubric of "equitable utilization." The rule of equitable utilization has been applied in international judicial and arbitral awards,¹⁹¹ adopted in innumerable treaties,¹⁹² and supported by the near unanimous opinions of the most highly-qualified publicists.¹⁹³ Every quasi-public international organization of lawyers, jurists, and scholars to consider the customary legal regime governing internationally shared water resources has embraced the concept of equitable utilization in one form or another.¹⁹⁴ Finally, the principle has been endorsed by

Niagara River, signed Feb. 27, 1950, United States-Canada, 1 U.S.T. 694, T.I.A.S. No. 2130, 132 U.N.T.S. 224; *Treaty Respecting Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande*, signed Feb. 3, 1944, Mexico-United States, 59 Stat. 1219, T.S. No. 994, 3 U.N.T.S. 313. See also SAMIR SALIBA, *THE JORDAN RIVER DISPUTE* 51-54, 57-59 (1968); TECLAFF, *supra* note 2, at 157-165; TECLAFF, *supra* note 7, at 429-43; Richard Baxter, *The Indus Basin*, in *INTERNATIONAL DRAINAGE BASINS*, *supra* note 182, at 443; Aziza Fahmi, *International River Law for Non-Navigable Rivers with Special Reference to the Nile*, 23 *REVUE ÉGYPTIENNE DE DROIT INTERNATIONAL* 39 (1967); Albert Garretson, *The Nile Basin*, in *INTERNATIONAL DRAINAGE BASINS*, *supra*, at 256; Sayed Hosni, *The Nile Regime*, 17 *REVUE ÉGYPTIENNE DE DROIT INTERNATIONAL* 70 (1961); Lipper, *supra* note 184, at 18, 49-57. See generally Charles Meyers, *The Colorado Basin*, in *INTERNATIONAL DRAINAGE BASINS*, *supra*, at 486.

190. See, e.g., *Agreement Concerning Frontier Rivers*, signed Sept. 16, 1971, Finland-Sweden, art. 5, 825 U.N.T.S. 191; *Agreement Concerning the Utilization of the Rapids of the Uruguay River*, signed Dec. 30, 1946, Argentina-Uruguay, art. 1, 671 L.N.T.S. 26; *Agreement Relating to Frontier Watercourses*, signed July 12, 1922, Denmark-Germany, art. 35, 10 L.N.T.S. 221; *Boundary Treaty*, signed Apr. 9, 1935, El Salvador-Guatemala, art. 2, 189 L.N.T.S. 295; *Treaty Concerning the Hydroelectric Utilization of the Paraná River*, signed Apr. 26, 1973, Brazil-Paraguay, art. 13, 923 U.N.T.S. 95; *Treaty of Friendship*, signed Feb. 26, 1921, Persia-Russian S.F.S.R., art. 3, 9 L.N.T.S. 403; *Treaty on Frontier Watercourses*, signed Dec. 20, 1933, Brazil-Uruguay, art. 19, 181 L.N.T.S. 85. See generally *Draft Articles*, *supra* note 184, arts. 5-7.

191. See, e.g., *Case of the Territorial Jurisdiction of the Int'l Comm'n of the Oder River*, [1929] P.C.I.J., ser. A, No. 23 at 27; *The Lake Lanoux Arbitration* (France v. Spain), 24 I.L.R. 101, 139 (1957), digested in 53 AM. J. INT'L L. 156, 170 (1959); *The Zarumilla River Arbitration* (Ecuador v. Brazil), *Informe de las Relaciones Exteriores a la Nación* 623 (Quito 1946), translated in William Griffin, *The Use of Waters of International Drainage Basins under Customary International Law*, 53 AM. J. INT'L L. 50, 61 (1959). See generally Utton, *supra* note 184, § 49.03(b).

192. These are collected in BERBER, *supra* note 7; SMITH, *supra* note 184; Dellapenna, *Treaties*, *supra* note 1; Schwebel, *supra* note 184, at 76-82, 88-90; Utton, *supra* note 184, § 49.03(a).

193. See the authorities collected *supra* at note 184.

194. INTER-AMERICAN BAR ASS'N, *RESOLUTION ON PRINCIPLES OF LAW GOVERNING THE USES OF INTERNATIONAL RIVERS AND LAKES* (1957); INSTITUT DE DROIT INTERNATIONAL, *UTILIZATION OF NON-MARITIME INTERNATIONAL WATERS (EXCEPT FOR NAVIGATION)*, art. 2 (Sept. 4-13, 1961); INTERNATIONAL L. ASS'N, *THE HELSINKI RULES ON THE USES OF THE*

the International Law Commission, an organ of the United Nations designed to foster the progressive codification of customary international law,¹⁹⁵ has embraced the principle as the dominant norm in its *Draft Articles on Non-Navigational Uses of International Watercourses*.¹⁹⁶ The *Draft Articles* provides as succinct a summary of the law as one can find today in two of its articles:

Article 5

Equitable and reasonable utilization and participation

(1) Watercourse States shall in their respective territories utilize an international watercourse in an equitable and reasonable manner. In particular, an international watercourse shall be used and developed by watercourse States with a view to attaining optimal utilization thereof and benefits therefrom consistent with adequate protection in the watercourse.

(2) Watercourse States shall participate in the use, development and protection of an international watercourse in an equitable and reasonable manner. Such participation includes both the right to utilize the watercourse and the duty to cooperate in the protection and development thereof, as provided in the present articles.

Article 7

Obligation not to cause significant harm

1. Watercourse States shall exercise due diligence to utilize an international watercourse in such a way as not to cause significant harm to other watercourse States.
2. Where, despite the exercise of due diligence, significant harm is caused to another watercourse State, the State whose

WATERS OF INTERNATIONAL RIVERS (Rep. of the 52d Conf., adopted at Helsinki, Aug. 20, 1966) ("*Helsinki Rules*"); INTERNATIONAL L. ASS'N, RESEARCH PROJECT ON THE LAW AND USES OF INTERNATIONAL RIVERS 197-98 (1959).

195. On the structure and purposes of the International Law Commission, see THE WORK OF THE INTERNATIONAL LAW COMMISSION (4th ed. 1988); IAN SINCLAIR, THE INTERNATIONAL LAW COMMISSION (1987).

196. *Draft Articles*, *supra* note 184, arts. 5-7, 10. See also ECONOMIC COMM'N FOR EUROPE, TWO DECADES OF CO-OPERATION ON WATER, U.N. Doc. ECE/ENVWA/2, at 1, 3 (1988).

use causes the harm shall, in the absence of agreement to such use, consult with the State suffering such harm over:

- (a) the extent to which such use has proved equitable and reasonable taking into account the factors listed in article 6;
- (b) the question of ad hoc adjustments to its utilization, designed to eliminate or mitigate any such harm caused and, where appropriate, the question of compensation.

How one reconciles these two articles in their current form is not entirely clear. Former Special Rapporteur Stephen McCaffrey, the primary draftsman of the 1991 version of the *Draft Articles*, finds "no harm" rule of article 7 dominant over the "equitable utilization" rule of article 5.¹⁹⁷ A careful reading of article 7 suggests, to the contrary, that the "no harm" rule is subordinated to rule of "equitable utilization." McCaffrey himself even concedes that subsection 2 implies that a use causing significant harm is not "per se a breach of the state's international obligations," echoing the International Law Commission's official commentary on the revised article that a use causing significant harm "would not of itself necessarily constitute a basis for banning it."¹⁹⁸

Article 7's subsection 1 recognizes only an obligation to use "due diligence" to avoid significant harm. Its subsection 2 declares an obligation for the state causing harm to consult with the injured state, but qualifies even that limited obligation by requiring consultation only over whether the harmful use is "equitable and reasonable" and over whether the harm might be reduced or prevented by "adjustments" to the way water is used. The reference to "the question of compensation" at the end of the subsection (2)(b) thus becomes highly ambiguous,¹⁹⁹ arguably limiting the obligation to pay compensation to situations where the harmful use is neither equitable nor reasonable. Compensation appears to be "appropriate" only if adjustments to reduce or prevent an "inequitable or unreasonable" harm are not possible. The ambiguity arises because the International Law Commission presumably did not intend that there would be no obligation to consult over steps to avoid or minimize harm

197. Stephen McCaffrey, *The International Law Commission Adopts Draft Articles on International Watercourses*, 89 AM. J. INT'L L. 395, 399-401 (1995).

198. ILC REPORT, *supra* note 184, at 236; McCaffrey, *supra* note 197, at 400. See also Richard Kyle Paisley & Timothy McDaniels, *International Water Law, Acceptable Pollution Risk and the Tatshenshini River*, 35 NAT. RESOURCES J. 111, 121 (1995).

199. McCaffrey, *supra* note 197, at 400-01.

for uses that were "equitable and reasonable." This interpretive problem is resolved if one reads the second obligation—the obligation to consult over mitigating harm—as explanatory rather than as indicating some independent duty: If harm can be prevented or reduced by reasonable adjustments in the manner, place, or timing of use, the harmful use is neither equitable nor reasonable. If so, subsection (b)(2)'s function is to make explicit the obligation to compensate for "inequitable and unreasonable" uses; in other words, article 7 explicitly subordinates the "no harm" rule to the now clearly primary rule of equitable utilization found in article 5—a proposition endorsed by Robert Rosenstock, the Special Rapporteur who drafted the final version of the *Draft Articles*.²⁰⁰

This is no mere abstract debate over fine points of legal doctrine. A stronger "no harm" rule would prohibit any meaningful use by an upper-riparian state, turning the rule into merely a variant form of the absolute integrity claim. Furthermore, as the state seeking to initiate a new use would generally be cast in the posture of the one creating the "injury," absolute integrity favors the more highly developed states at the expense of their less developed neighbors, particularly as the lower basin states tend to develop earlier and faster than upper basin states.²⁰¹ Such a posture is hardly conducive to achieving the developmental equity proclaimed under various banners at the United Nations. The only equitable way to resolve such concerns is to allow each a reasonable and equitable share, rather than attempting to insist that a state's development of its waters not harm another state. As the German federal supreme court stated in *The Danauversinkung Case (Württemberg v. Baden)*,²⁰² "[o]ne must consider not only the absolute injury caused to the neighbor-

200. Robert Rosenstock, *The Forty-Ninth Session of the International Law Commission*, 89 AM. J. INT'L L. 390, 392 (1995).

201. I examine this point at some length in Dellapenna, *Rivers*, *supra* note 1. See also Charles Bourne, *Principles and Planned Measures*, 3 COLO. J. INT'L ENVTL. L. & POL'Y 65, 92 (1992); Garretson, *supra* note 189, at 256, 264-65. See generally James Westcoat, jr., *Beyond the River Basin: The Changing Geography of International Water Problems and International Watercourse Law*, 3 COLO. J. INT'L ENVTL. L. & POL'Y 301 (1992). The exceptions generally occur in situations where a region is colonized by a technologically more developed culture from outside the region. Perhaps the most notable example is the United States relative to Mexico. See Alberto Székely, "General Principles" and "Planned Measures" Provisions in the International Law Commission's Draft Articles on the Non-Navigational Uses of International Watercourses: A Mexican Point of View, 3 COLO. J. INT'L ENVTL. L. & POL'Y 93 (1992).

202. ANN. DIGEST & REP. OF PUB. INT'L L. CASES 128 (Wrest. 1927).

ing State, but also the relation of the advantage gained by one to the injury caused to the other.”²⁰³

C. *Claims and Counter-Claims Relating to the Two Rivers*

Without either formal agreements or effective multilateral machinery regarding the international sharing of the waters of the two rivers, the states sharing the Mesopotamian basin have been left to the informal processes of claim and counter-claim that forms the method of customary international law.²⁰⁴ In Mesopotamia, this has resulted in some oral agreements, the meaning of which, and even the existence of which, is disputed between the parties. And these agreements, such as they are, refer only to the Euphrates; there isn't even that much of an arrangement regarding the Tigris.²⁰⁵

Apparently the earliest actual recent promise to restrain one nation's use to assure water to the other riparian states was a promise by Turkey in 1964 to assure a flow of a mere 350 m³/sec of water in the Euphrates.²⁰⁶ During the Tabqa Dam dispute,²⁰⁷ Turkey increased its promised releases to 450 m³/sec,²⁰⁸ ostensibly as an accommodation to Syria, but actually to defuse possible protests over Turkey's own Keban Dam. Eventually, Syria also agreed to release an additional 200 MCM from Lake Assad to ameliorate the Iraqi complaints, but insisted that it did so as a favor and not because of any legal right in Iraq.²⁰⁹

Syria's legal position during the disputes with Iraq over the Euphrates took the form of the classic claim of absolute sovereignty.²¹⁰ This posture fit nicely with the Syrian claim of absolute sovereignty over the Baniyas Spring feeding the upper Jordan River,²¹¹ but did not take into account that Syria was downriver from Turkey on both the Euphrates and the Tigris Rivers, as well as downriver from Lebanon on the Orontes

203. See also Bourne, *supra* note 201, at 82-92; Schwebel, *supra* note 184, at 102; Utton, *supra* note 184, §§ 49.05, 49.06.

204. Hager, *supra* note 2, at 215-17.

205. KLIOT, *supra* note 2, at 161.

206. *Id.*

207. See the text *supra* at notes 80-86.

208. KLIOT, *supra* note 2, at 161.

209. *Id.*, at 161-62; WATER IN THE MIDDLE EAST, *supra* note 1, at 94; Tvedt, *supra* note 8, at 16.

210. Calleigh, *supra* note 33, at 127; Cohen, *supra* note 13, at 512.

211. SALIBA, *supra* note 189, at 144; WATER IN THE MIDDLE EAST, *supra* note 1, at 167-68, 173-74; Dellapenna, *Jordan Valley*, *supra* note 1, at 41.

River.²¹² Nor did this position sit well with Syria's position down-slope on one or more aquifers shared with Turkey.²¹³ Turkey's actions would shortly compel Syria to confront this neglect.

When the Atatürk Dam was closed in 1990, Turkey's Prime Minister pledged to assure a flow of the Euphrates of 500 m³/sec through the Atatürk Dam.²¹⁴ This rate of flow through the dam would allow only about 9 BCM annually to flow down to Syria and Iraq.²¹⁵ Turkey treats this promise as a matter of accommodation, and not as a legal obligation, even though it is included in a bilateral agreement between Syria and Turkey signed in 1987.²¹⁶ The relevant language of that agreement reads:

During the filling up period of the Atatürk dam reservoir and until the final allocation of the waters of the Euphrates among the three riparian countries, the Turkish side undertakes to release a yearly average of more than 500 cubic meters per second at the Turkish-Syrian border and in cases where the monthly flow falls below the level of 500 m³/sec., the Turkish side agrees to make up the difference during the following month.²¹⁷

Turkey has not entirely lived up to this promise, but then neither has Syria lived up to its promises in the same agreement not to allow anti-Turkish activities—by the Kurdish Workers Party—on Syrian soil.²¹⁸ While Turkey has, on at least one occasion, released water from the dam

212. For a detailed description of the geography of the Orontes, see WATER IN THE MIDDLE EAST, *supra* note 1, at 115-18.

213. Waterbury, *supra* note 49, at 141-42.

214. KLIOT, *supra* note 2, at 162; Chalabi & Majzoub, *supra* note 13, at 207-08, 215; Gruen, *supra* note 125, at 280; Kolars, *supra* note 11, at 107; Tekeli, *supra* note 71, at 210.

215. Kolars, *supra* note 11, at 107-08. Many others have estimated that water delivers to Syria will amount to about 15 BCM/year, although this perhaps involves a double counting. HILLEL, *supra* note 2, at 103, 106; KLIOT, *supra* note 2, at 137, 145-46, 149; Chalabi & Majzoub, *supra* note 13, at 204-05; Gruen, *supra* note 125, at 280; Tekeli, *supra* note 71, at 210; Waterbury, *supra* note 49, at 55. Kolars indicates that the Euphrates water crossing the Syrian border will be about 9 BCM/year, and the Euphrates water crossing the border to Iraq will be about 6 BCM/year—but the latter water will, of course, be composed mostly of the residue of the water crossing the Syrian border as only small amounts are contributed by tributaries feeding into the Euphrates in Syria. See also Joffé, *supra* note 20, at 76.

216. Bakour & Kolars, *supra* note 2, at 134, 139; Chalabi & Majzoub, *supra* note 13, at 213; Cohen, *supra* note 13, at 513; Gruen, *supra* note 20, at 101-03, 105-06; Waterbury, *supra* note 49, at 58.

217. *Protocol on Matters Pertaining to Economic Cooperation*, signed July 26, 1987, Syria-Turkey, art. 6 (unpublished). See Chalabi & Majzoub, *supra* note 13, at 228.

218. Gruen, *supra* note 20, at 102-03.

to maintain the flow at 500 m³/sec., thereby delaying the filling of the reservoir, Turkey has also virtually closed down the Euphrates for one winter month in 1990 and again during the Gulf War, reducing the flow to 125 m³/sec in order to accelerate the filling of the reservoir behind the Atatürk Dam.²¹⁹ Iraq and Syria protested vigorously against receiving such a small amount of water in the Euphrates, both rejecting Turkish claims to absolute sovereignty.²²⁰ Iraq's claim to the absolute integrity of the river was consistent with its approach toward its other neighbors, particularly Syria.²²¹ Syria, however, was embarrassed by its earlier claims of absolute sovereignty in water disputes with downstream neighbors, and continued to do so *vis-à-vis* Iraq, Israel, and Jordan.²²² Against Turkey, Syria based its claim on the theory of restricted sovereignty, demanding a "reasonable share" of the flow of the Euphrates.²²³ As the proposed guaranteed flow was adequate to meet Syrian needs (if Syria disregarded any obligation to deliver water to Iraq), Syria did not persist in its objections.²²⁴ Still, the disputes between Syria and Turkey over the GAP probably played a role in inducing Syria to support covertly the Kurdish rebellion against the Turks for this would, at the least, slow the development plans of the Turks for both the Tigris and the Euphrates.²²⁵

Iraq faces a real possibility of a near exhaustion of the Euphrates as a source of water by Syria and Turkey; it therefore has had no option but

219. HILLEL, *supra* note 2, at 106; KLIOT, *supra* note 2, at 128, 162; Cohen, *supra* note 13, at 513-14; Alan Cowell, *Now, a Little Stream, Later, Maybe a Water War*, N.Y. TIMES, Feb. 2, 1990, at A11; Haberman, *supra* note 53, at A4; Nick Williams, jr., *Parched Iraq, Syria Jittery as Turks Divert Euphrates to Power Project*, L.A. TIMES, Jan. 14, 1990, at A8. On releases during the drought of 1991, see Gruen, *supra* note 20, at 105. See also Ilter Turan, *Politics of Water and the Role of Regional Organizations: The Middle East*, in POLICY AND INSTITUTIONAL ASPECTS, *supra* note 3, at 152, 155 (the Turks reduced the flow of the Euphrates to 170 m³/sec. in 1993 because of lull in the needs electricity, causing them to release less water through their turbines).

220. KLIOT, *supra* note 2, at 123; Sheherezade Daneshku & Andrews Gowers, *Shrinking Euphrates Raises Turkish-Syrian Tension*, FIN. TIMES, Oct. 23, 1990, § 1, at 3; Gruen, *supra* note 20, at 101; Hager, *supra* note 2, at 216-17; Tekeli, *supra* note 71, at 211.

221. See text *supra* at notes 80-86.

222. See the authorities collected *supra* at note 212.

223. HILLEL, *supra* note 2, at 306 n.12; KLIOT, *supra* note 2, at 123; Hager, *supra* note 2, at 216.

224. Joffé, *supra* note 20, at 76; Kolars, *supra* note 11, at 115. There were, however, persistent rumors of a Syrian plot to blow up the Atatürk Dam. Starr & Alley, *supra* note 37, at 5.

225. BESCHORNER, *supra* note 107, at 37; KLIOT, *supra* note 2, at 164-65; Cohen, *supra* note 13, at 513; Cowell, *supra* note 219; Gruen, *supra* note 20, at 102-04, 106; Haberman, *supra* note 107, at A4; Hager, *supra* note 2, at 221-22; Tvedt, *supra* note 8, at 18; Turan, *supra* note 219, at 155; Waterbury, *supra* note 49, at 55.

to the continues its objections to Turkey's activities. The seriousness of the difficulties facing Iraq was made clear when Iraq and Syria signed an agreement on April 16, 1990, to share whatever water reaches Syria from Turkey on a basis 42% to Syria and 58% to Iraq.²²⁶ If the optimistic estimates of Syria receiving 15 BCM of water in the Euphrates were realized, this agreement would reduce Iraq's present usage from the river by about half.²²⁷ Syria would lose nearly half of its planned usage as well, and if actual deliveries were to fall below this level, the outcome would be even worse for Iraq and Syria. Yet none of these figures factor in that increasingly the water reaching Syria and especially Iraq will be degraded return flows of ever poorer quality, or that something like 5 BCM must remain in the Euphrates if one is to maintain any sense of ecological integrity.²²⁸ These figures raise real questions about how seriously Iraq can rely on the Syrian promise when Syria continues with plans to vastly increase its use and when the relations between Iraq and Syria are so hostile in other respects.²²⁹

Iraq faced an even greater risk when Turkey proposed to sell water to national communities outside the basin of the two rivers. Iraq has gone further than Syria, demanding that Turkey respect the absolute integrity of the river, or at least that Turkey cause "no harm" to established uses downstream.²³⁰ The proposal to export water from the upper Euphrates to national communities outside the watershed of the river has already generated major regional opposition, particularly from Iraq.²³¹ At the very least, such exports demonstrate that Turkey does not need the water it is storing from the Euphrates, and thus that Iraq and Syria's "equitable shares" should be larger than Turkey would concede to them. The "Peace Pipeline" proposals therefore include substantial

226. BESCHORNER, *supra* note 107, at 41-42; KLIOT, *supra* note 2, at 149, 162; Bakour & Kolars, *supra* note 2, at 139; Cohen, *supra* note 13, at 513-14; Gruen, *supra* note 20, at 100; Waterbury, *supra* note 49, at 57.

227. STARR & STOLL, *supra* note 33, at 9; Chalabi & Majzoub, *supra* note 13, at 204, 208; Cohen, *supra* note 13, at 515; B.A. Hurwitz, *The Water Crisis in the Middle East*, 13 MIDDLE EAST F. 6 (1991); Jeffrey Lee & John Bulloch, *Spirit of War Moves on Mid-East Waters: Arab States Fear a Plot to Control Their Supplies of Water*, THE INDEPENDENT, May 13, 1990, at 13, 13; Waterbury, *supra* note 49, at 58-59. For Iraqi usage, see the text *supra* at note 49-52.

228. KLIOT, *supra* note 2, at 149-50; Waterbury, *supra* note 49, at 58. See also Clor, *supra* note 83, at 36-37.

229. Waterbury, *supra* note 49, at 57-58.

230. MAJID KHADDURI, *SOCIALIST IRAQ* 163 (1978); KLIOT, *supra* note 2, at 123; Gruen, *supra* note 20, at 101, 105. Robert Hager has characterized the Iraqi claims as being based upon priority of use rather than on the integrity of the river. Hager, *supra* note 2, at 215-16, 219-20.

231. Gruen, *supra* note 125, at 282.

water benefits for the Syrians, typically as much as one-sixth of the water to be exported.²³² Syria's acceptance of such benefits, along with the realization of hydropower generation capabilities offered by the pipeline, could largely defuse their objections to any such proposal.²³³ No comparable arrangements have been proposed for Iraq, however, leaving Iraq to press the legal case against the pipeline.

The Iraqis in this regard are much stronger position to object than are the Ethiopians who have raised comparable objections to the proposed export of Nile water to the Jordan Valley.²³⁴ Unlike Egyptian diversions from the Nile, Turkish exports actually will reduce the amount of water flowing down to Iraq and Syria. Even exporting the water from the Ceyhan and Seyhan Rivers or even from other rivers rather than directly from the Euphrates²³⁵ would not seriously undermine Iraqi arguments as they could legitimately argue that directly or indirectly Euphrates water is used to replace the exported water. As a result of these concerns, the Iraqis are demanding that the water flowing in the Euphrates at the Syrian-Turkish border be increased from 500 m³/sec. to 700 m³/sec.²³⁶ For now, the grander version of the Peace Pipeline seems stillborn, not because of Iraqi opposition but because Saudi Arabia and the Gulf States seemed uninterested in accepting the costs (political as well as financial) of bringing the water from such a distance,²³⁷ and even the more modest proposal to export water to the Jordan Valley could founder on Iraqi opposition.

Even apart from the Peace Pipeline proposal, Turkey has found itself caught between its development desires and its need to appear to be a

232. See the text *supra* at notes 129-34.

233. See § 5.03(c)(2), at notes 173-77.

234. HILLEL, *supra* note 2, at 127-28, 247-48; ELISHA KALLY & GIDEON FISHELSON, WATER AND PEACE: WATER RESOURCES AND THE ARAB-ISRAELI PEACE PROCESS 105 (1993); R.O. Collins, *History, Hydropolitics, and the Nile: Nile Control: Myth or Reality?*, in THE NILE, *supra* note 15, at 153, 167; Gruen, *supra* note 125, at 277; Raj Krishna, *The Legal Regime of the Nile Basin*, in THE POLITICS OF SCARCITY, *supra* note 125, at 23, 32-34; Aaron Wolf & John Ross, *The Impact of Scarce Water Resources on the Arab-Israeli Conflict*, 32 NAT. RESOURCES J. 919, 942-43 (1992); El-Sayyid Zohra, *Egypt's Water Needs and the Dangers of Diverting Nile Water to Israel*, in ISRAEL AND ARAB WATER, *supra* note 2, at 63-65; Kamel Zuheiri, *Development Projects on the Nile and Israel's Water Objectives*, in ISRAEL AND ARAB WATER, *supra*, at 57, 60-62; Wolf, *supra* note 76, at 30-31.

235. KLIOT, *supra* note 2, at 132; Gruen, *supra* note 125, at 282-83; Wachtel, *supra* note 14, at 365-67.

236. KLIOT, *supra* note 2, at 162; Chalabi & Majzoub, *supra* note 13, at 207; Cohen, *supra* note 13, at 514 n.71; Gruen, *supra* note 125, at 282; Gruen, *supra* note 20, at 104; Kolars, *supra* note 11, at 115; Tekeli, *supra* note 71, at 210; Wachtel, *supra* note 14, at 366-67.

237. See the text *supra* at note 138.

"good neighbor" as it seeks membership in the European Union.²³⁸ In order to do so, Turkey has consistently portrayed itself as a peaceful state seeking a cooperative result with its co-riparians based upon technical solutions.²³⁹ As part of this campaign, Turkey has offered to sell electricity both to Iraq and to Syria on favorable terms.²⁴⁰ Turkey's claimed legal position, however, actually belies such a posture. In particular, the Turks claim that the Euphrates and Tigris Rivers are "transboundary" rivers rather than "international" rivers, and thus not subject to the rule of equitable utilization.²⁴¹ Turkey claims absolute sovereignty over its "transboundary rivers" before they cross the border, analogizing to the absolute ownership of oil by states where oil fields are located.²⁴² Turkey also would restrict negotiations to the main stem of the river, ignoring the contributions of any tributaries, basing this position on principles adopted at the Congress of Vienna in 1815.²⁴³

Turkey's legal claims contradict the explicit terms of both the Helsinki Rules and the International Law Commission's *Draft Articles*.²⁴⁴ Nor is there any support for this position in state practice. The Vienna Congress principles were intended to deal only with freedom of navigation, and not to the allocation of water to consumptive uses at all.²⁴⁵ Even the analogy to oil does not hold up, as it ignores the obligation of "equitable pooling" imposed upon transboundary oil

238. KLIOT, *supra* note 2, at 163, 167.

239. *Id.*, at 163; Tekeli, *supra* note 71, at 214.

240. KLIOT, *supra* note 2, at 163; Tekeli, *supra* note 71, at 213.

241. KLIOT, *supra* note 2, at 162-63; Chalabi & Majzoub, *supra* note 13, at 209-12; Cohen, *supra* note 13, at 527-28; Sam Cohen, *Iraq, Syria Challenge Turkey on Water Use*, CHRISTIAN SCI. MONITOR, July 2, 1990, at 6; Gruen, *supra* note 20, at 101; Waterbury, *supra* note 49, at 57. This proposition serves to distinguish other waters shared by Turkey with Bulgaria, Greece, and the U.S.S.R., on all of which waters Turkey has reached agreements regarding equitable sharing. See *Accord Relative to the Regulation of Hydraulic Works on the Maritza/Evros River*, signed June 20, 1934, Greece-Turkey, pt. III, LEGISLATIVE TEXTS, *supra* note 148, no. 220; *Agreement Concerning Co-Operation in the Use of Waters of Rivers Flowing through the Territory of Both Countries*, signed Oct. 23, 1968, Bulgaria-Turkey, TREATIES CONCERNING THE NON-NAVIGATIONAL USES OF INTERNATIONAL WATERCOURSES—EUROPE No. 22 (FAO Legislative Study no. 50, Stefano Burchi ed. 1993); *Convention Regarding the Use of Frontier Waters*, signed Jan. 8, 1927, Turkey-U.S.S.R., arts. 1, 11, LEGISLATIVE TEXTS, *supra*, no. 106.

242. HILLEL, *supra* note 2, at 305 n.5; Chalabi & Majzoub, *supra* note 13, at 208-09, 212-13, 215, 226 n.113; Gruen, *supra* note 20, at 101.

243. Waterbury, *supra* note 49, at 57.

244. *Draft Articles*, *supra* note 184, art. 2(A); *Helsinki Rules*, *supra* note 194, arts. 2, 3. See Chalabi & Majzoub, *supra* note 13, at 215-29; Gruen, *supra* note 20, at 101.

245. See G. KAECKENBEECK, INTERNATIONAL RIVERS 37-61 (1919). See also CAPONERA, *supra* note 7, at 185.

fields.²⁴⁶ Under these circumstances, the Turkish position must be considered flatly wrong.

Turkey adopted such a dubious legal position because its position in any dispute resolution focusing on equitable utilization is bound to be weak. Turkey has abundant sources of water other than the Euphrates and the Tigris; those two rivers comprise only about 45% of the total water resources available to Turkey.²⁴⁷ In contrast, those rivers comprise about 80% of the water resources of Syria, and 98% of the surface waters available to Iraq.²⁴⁸ In light of these facts, Turkey cannot validly claim the lion's share of the water from those two rivers, whether for its own inefficient consumption practices, for sale to other national communities, or to replace other waters to be sold to the other national communities²⁴⁹—even though the other national communities also desperately need water. On the other hand, Iraq in particular cannot claim a vested right to continue its highly inefficient water-use practices.²⁵⁰ Nor should Turkey have to bear the entire cost of building the necessary facilities to assure adequate water supplies to Iraq and Syria, although those two states have not expressed any willingness to pay part of the cost of adapting Turkey's facilities to their needs.²⁵¹ Ultimately, the needs of the entire fertile crescent can only be met by the sort of

246. See Rainer Lagoni, *Oil Deposits across National Frontiers*, 73 AM. J. INT'L L. 215 (1979); Thomas Reynolds, Note, *The Delimitation, Exploitation, and Allocation of Transboundary Oil & Gas Deposits between Nation States*, 1 ILSA J. INT'L & COMP. L. 135 (1995); Alberto Székely, *The International Law of Substantive Transboundary Hydrocarbon Resources: Legal Limits to Behavior and Experiences for the Gulf of Mexico*, 26 NAT. RESOURCES J. 733 (1986); Alberto Székely et al., *Transboundary Hydrocarbon Resources: The Puerto Vallarta Draft Treaty*, 31 NAT. RESOURCES J. 609 (1991); Albert Utton & Paul McHugh, *On an Institutional Arrangement for Developing Oil and Gas in the Gulf of Mexico*, 26 NAT. RESOURCES J. 717 (1986). See also BRUCE KRAMER & PATRICK MARTIN, *THE LAW OF POOLING AND UNITIZATION* (1991); Larry Eubanks & Michael Mueller, *An Economic Analysis of Oklahoma's Oil and Gas Forced Pooling Law*, 26 NAT. RESOURCES J. 469 (1986); William Richards, Thomas Mitchell, & Michael Johnson, *Oil and Gas Conservation in Utah after Cowling: The Law of Capture Receives a New Lease on Life*, 14 J. ENERGY, NAT. RESOURCES & ENVTL. L. 1 (1994); Christy Schweikhardt, *Horizontal Perspective: Texas Oil & Gas Law in Light of Horizontal Drilling Technology*, 34 S. TEX. L. REV. 329 (1993).

247. BEAUMONT, BLAKE, & WAGSTAFF, *supra* note 8, at 384; KLIOT, *supra* note 2, at 134-35, 150; Kolars, *supra* note 11, at 117.

248. BEAUMONT, BLAKE, & WAGSTAFF, *supra* note 8, at 384; GISCHLER, *supra* note 17, at 100, 114; KLIOT, *supra* note 2, at 138, 143, 150.

249. KLIOT, *supra* note 2, at 150, 171-72. On Turkish inefficiencies, see Gruen, *supra* note 20, at 103.

250. BEAUMONT, BLAKE, & WAGSTAFF, *supra* note 8, at 352, 364; FISHER, *supra* note 53, at 378; KLIOT, *supra* note 2, at 146, 150, 158, 163-64; Ockerman & Samano, *supra* note 49, at 194; Saleh, *supra* note 2, at 73-74; Ubell, *supra* note 49, at 3.

251. KLIOT, *supra* note 2, at 163-64; Tekeli, *supra* note 71, at 215.

regional management arrangement.²⁵² It is to this possibility that I shall address a few comments in the conclusion.

VI. CONCLUSION: THE NEED FOR INTEGRATED MANAGEMENT

The problem to be solved in the land between the two rivers is how to allocate equitably the waters of the two rivers, especially of the Euphrates. The existing informal agreements arguably do this, with Turkey promising to Syria to deliver 500 m³/sec. on the Euphrates to the Syria border, and Syria promising to Iraq not to consume more than 42 % of the water that arrives at its border with Turkey.²⁵³ None of the states involved, however, treat the agreements as final or definitive. Given the pressures of population growth, wasteful and extravagant usage of water, and mutual hostility, a final and definitive determination of what the equitable shares of Iraq and Syria are will not be easy to achieve.²⁵⁴

Even if the states were to agree to a partition of the waters, this would be a less than optimum solution. With each nation undertaking to store and develop its own share of the waters, excessive storage capacity will probably be built in the region.²⁵⁵ Even if there is no excessive storage capacity, there will be excessive and unnecessary evaporation losses because so much of the storage capacity will be built on the hot, dry plains of Iraq with the reservoir spreading over a large surface area, rather than in the relatively cool and narrow gorges of Turkey.²⁵⁶ In addition, each nation will build diversion and drainage works that are either duplicative or reciprocal, *i.e.*, with roughly parallel canals carrying water in the same direction or on opposite directions on either side of a border, when a single canal (or perhaps no canal at all) would achieve the same or similar values with far less economic and environmental costs than would be under the unilateral approach to water management that

252. See also STARR & STOLL, *supra* note 33, at 1-3, 40-43; Bakour & Kolars, *supra* note 2, at 143-44; Chalabi & Majzoub, *supra* note 13, at 227-29; Cohen, *supra* note 13, at 529-56; Kolars, *supra* note 48, at 87-91; Bilen, *supra* note 14, at 109-14; Sadik & Barghouti, *supra* note 52, at 22-24, 33-34; Turan, *supra* note 219, at 157. For a skeptical view of this possibility, see Waterbury, *supra* note 49, at 61-62.

253. See the text *supra* at notes 214-17, 226-27.

254. See, *e.g.*, KLIOT, *supra* note 2, at 100-72, 270-72; Chalabi & Majzoub, *supra* note 13, at 213-14; Gruen, *supra* note 20.

255. See the authorities collected *supra* at note 42.

256. HILLEL, *supra* note 2, at 103; IONIDES, *supra* note 21, at 111; KLIOT, *supra* note 2, at 122, 136; Beaumont, *supra* note 14, at 38-39. More than half of the current evaporation losses occur in Iraq for the reasons indicated in the text.

results from partition.²⁵⁷ All of this is without considering the likelihood of cheating and the difficulty of monitoring compliance under a partitioning approach—not to mention the rigidity of the system in the face of impending global warming.

The restricted sovereignty approach to internationally shared waters rests ultimately on the concept of an international drainage basin as a coherent juridical and managerial unit, a concept widely supported by naturalists, engineers, and economists.²⁵⁸ The notion gives rise to the concept of integrated, basin-wide management of water resources transcending national (and other) frontiers. The United Nations has endorsed this principle at just about every opportunity. The most succinct and emphatic statement of this conclusion within U.N.-sponsored activities was the opening statement in a working paper prepared by the U.N. Secretariat for the Fourth Regional Technical Conference on Water Resources Development in Asia and the Far East, held in Colombo in 1960: "River basin development projects are now necessarily multipurpose and lead to unified development."²⁵⁹ The U.N. Economic Commission for Europe has adopted three instruments relative to international water management. The "Declaration of Policy on Prevention and Control of Water Pollution, Including Transboundary Pollution," merely indicates that "rational utilization of water resources" is a basic element of long-term water management.²⁶⁰ The "Declaration of Policy on the Rational Use of Water" recommended a "unified strategy" and "coordinated utilization."²⁶¹ The "Recommendations to ECE Governments on Long-Term Planning of Water Management" endorse basin-wide, cooperative management of shared water resources.²⁶² And the principle were endorsed unanimously by the United

257. For studies of the costs associated with the fairly successful partition of the waters of the Indus Valley between India and Pakistan, see Brian Concannon, Note, *The Indus Waters Treaty: Three Decades of Success, Yet, Will It Endure?*, 1 GEO. INT'L ENVTL. L. REV. 55, 69-74 (1989); M.Y. Khan, *Boundary Water Conflict between India and Pakistan*, 15 WATER INT'L 195 (1990). See generally Blair Bower, *Some Physical, Technological, and Economic Characteristics of Water and Water Resource Systems: Implications for Administration*, 3 NAT. RESOURCES J. 215 (1963); Utton, *supra* note 184, § 49.08.

258. JOHAN LAMMERS, POLLUTION OF INTERNATIONAL WATERCOURSES 18 (1984); TECLAFF, *supra* note 2; Stephen McCaffrey, *International Organizations and the Holistic Approach to Water Problems*, 31 NAT. RESOURCES J. 139, 143 (1991); Xue Hanqin, *Relativity in International Water Law*, 3 COLO. J. INT'L ENVTL. L. & POL'Y 45, 46-48 (1992).

259. U.N. Doc. No. St./ECAFE/Ser.F/19, at 61 (1962).

260. Decision B (XXXV), adopted at the 35th Sess. (1980), in ECONOMIC COMM'N FOR EUROPE, TWO DECADES OF CO-OPERATION ON WATER, U.N. Doc. ECE/ENVWA/2, at 1, 3 (1988) ("ECE").

261. Decision C (XXXIX), in ECE, *supra* note 260, at 12, 15.

262. ECE, *supra* note 260, at 39, 41.

Nations Water Conference at Mar del Plata, Argentina, in 1977.²⁶³ This goal, and the avoidance of the inefficiencies and other problems inherent in partition, can only be avoided by creating a regional water management authority including (at the least) Iraq, Syria, and Turkey. It would be better, but not essential, to include Iran, given its relation to the Tigris River. On the other hand, if the Peace Pipeline (or something like it) were to be included, one would need to add Israel, Jordan, Lebanon, and Palestine (and perhaps some others).

A regional relationship involving at least the three active riparian states (Iraq, Syria, and Turkey), is easy to envision but would likely be extraordinarily difficult to realize given the hostilities between or even within these states. Enlarging it either to the west (Iran) or to the southwest (Israel, Jordan, Lebanon, Palestine) would be even more difficult. Only the extreme need likely to emerge as global warming becomes a reality is likely to overcome this hostility—if it does not prompt “water wars” instead.²⁶⁴

On the positive side, one can note that the four riparian states (Iran, Iraq, Syria, and Turkey) all share a common legal and cultural tradition regarding their approach to water management issues derived from the traditional Islamic law—the *shari'a*. Indeed, the very word *shari'a* originally meant “the path to the watering place.”²⁶⁵ The *shari'a*

263. REPORT OF THE UNITED NATIONS WATER CONFERENCE, MAR DEL PLATA, 14-25 MARCH, 1977, at 53, U.N. Doc. No. E.77.II.A.12 (recommendations 90, 91). See Utton, *supra* note 184, § 49.09, at 39-40. One might also refer to the many directives issued by the European Community relative to shared waters; I refrain from doing so in that these directives appear more like domestic legislation than like international decisions. See generally CAPONERA, *supra* note 7, at 190-91.

264. See Ewan Anderson, *White Oil*, GEOGRAPHICAL MAG., Feb. 1991, at 10; Richard Chesnoff, *When Water Feeds Flames*, U.S. NEWS & WORLD REP., Nov. 21, 1988, at 47; John Cooley, *Behind the News: The Hydraulic Imperative*, 205 MIDDLE EAST INT'L 10 (July 22, 1983); John Cooley, *The War over Water*, 54 FOR. AFF. 3 (1984); Jeffrey Lee & John Bulloch, *Spirit of War Moves on Mid-East Waters: Arab States Fear a Plot to Control Their Supplies of Water*, THE INDEPENDENT, May 13, 1990, at 13; Deborah Pugh, *Egypt: Next War Could Be over Water Quotas from the Nile*, THE GUARDIAN, Oct. 12, 1990, at 33; Starr, *supra* note 82; Thomas Stauffer, *The Lure of the Litani*, MIDDLE EAST INT'L (July 30, 1982); Symposium, *Water Politics*, THE MIDDLE EAST, Spec. Rep. No. 76 at 47-54 (1981); Christopher Walker, *Seeds of Conflict Are Water-Borne in Parched Middle East*, THE TIMES (London), Mar. 27, 1990, at 11; Christopher Walker, *Egypt Warns Sudan over New Threat to Cut Nile Waters*, THE TIMES (London), July 4, 1995, at 11; Aaron Wolf & John Ross, *The Impact of Scarce Water Resources on the Arab-Israeli Conflict*, 32 NAT. RESOURCES J. 919 (1992).

265. Joseph Schacht, *Shari'a*, SHORTER ENCYCLOPEDIA OF ISLAM 524 (H.A.R. Gibb et al. eds. 1965 ed.). See also Chibli Mallat, *The Quest for Water Use Principles: Reflections on Shari'a and Custom in the Middle East*, in LEGAL, POLITICAL AND COMMERCIAL IMPLICATIONS, *supra* note 1, at 127, 128. See generally HILLEL, *supra* note 2, at 26-28.

allocates community water among users and calls upon water users from time to time to maintain the communal water system.²⁶⁶ We can trace this approach all the way back to the Code of Hammurabi in ancient Babylon and down to the present day.²⁶⁷

Expanding the regional management scheme to include the entire Fertile Crescent would bring in Israel, the law of which is not based upon the *shari'a*. The Israeli legal tradition pertaining to water is not materially different from the modern concepts applicable to water in the Islamic states. The ancient traditions—almost as old as the Code of Hammurabi—is very similar to the *shari'a* and its antecedents.²⁶⁸ Whether the laws laid down by the prophets are derived from Babylonian roots or simply reflect similar responses to similar problems hardly

266. YAHYA BEN ADAM, *KITAB AL-KHARAJ* 55 (A. Ben Shemesh ed. 1967); ALI IBN MUHAMMAD AL-MAWARDI, *TRAITÉ DE DROIT PUBLIC MUSULMAN* 321 (1901); MUHAMMAD IBN ISMA'IL AL-BUKHARI [EL BOKHÂRÎ], 2 *LES TRADITIONS ISLAMIQUES* 104, 108 (O. Oudas & W. Marçais trans. & eds. 1906 ed.). See also CAPONERA, *supra* note 7, at 15-18, 21-23; HILLEL, *supra* note 2, at 23-28, 55-56, 267-69; MAJID KHADDURI, *MAJOR MIDDLE EASTERN PROBLEMS IN INTERNATIONAL LAW* 105-121 (1972); MICHAEL NORVELLE, *WATER USE AND OWNERSHIP ACCORDING TO THE TEXTS OF HANBALI FIQH* (unpub. Ph.D. dissertation, McGill University 1980); TECLAFF, *supra* note 2, at 15-25; TECLAFF, *supra* note 8, at 35-45, 223; Abraham Hirsch, *Water Legislation in the Middle East*, 8 AM. J. COMP. L. 168, 169-75, 186 (1959); Mallat, *supra* note 265; Ian Murray Matley, *Agricultural Development*, in *CENTRAL ASIA: A CENTURY OF RUSSIAN RULE* 267, 271, 279-81 (Edward Allworth ed. 1967); Thomas Naff, *Conflict and Water Use in the Middle East*, in *WATER IN THE ARAB WORLD*, *supra* note 2, at 253, 268-69; John Wilkinson, *Muslim Land and Water Law*, 1 J. ISLAMIC STUD. 54 (1990).

267. 2 *THE BABYLONIAN LAWS* 103-05, 129-33, 143, 153-55 (S.R. Driver & J.C. Miles eds. 2d ed. 1956). On the modern law and practices relating to water, see CAPONERA, *supra* note 7, at 68-80; ANN LAMBTON, *LANDLORD AND PEASANT IN PERSIA: A STUDY OF LAND TENURE AND LAND REVENUE ADMINISTRATION* 7, 210-29, 319-20 (2d ed. 1991); A.M.A. MAKTARI, *WATER RIGHTS AND IRRIGATION PRACTICES IN LAHJ* (1971); LOUIS MILLIOT, *INTRODUCTION A L'ÉTUDE DU DROIT MUSULMAN* 580 (1953); J.C. WILKINSON, *WATER AND TRIBAL SETTLEMENT IN SOUTH-EAST ARABIA: A STUDY OF THE AFLAJ OF OMAN* (1977); Habib Attia, *Water Sharing Rights in the Jerid Oases of Tunisia*, in *PROPERTY, SOCIAL STRUCTURE, AND LAW IN THE MODERN MIDDLE EAST* 85 (Ann Elizabeth Mayer ed. 1985) ("THE MODERN MIDDLE EAST"); Abdellah Hammoudi, *Substance and Relation: Water Rights and Water Distribution in the Dra' Valley*, in *THE MODERN MIDDLE EAST*, *supra*, at 27; Pamela Johnson & Stephen Lintner, *Centralism and Pluralism: Legal Issues in Three Middle Eastern Area Development Projects*, in *THE MODERN MIDDLE EAST*, *supra* note 211, at 237; Hyam Mallat, *Water Laws in Lebanon*, in *LEGAL, POLITICAL AND COMMERCIAL IMPLICATIONS*, *supra* note 1, at 151; P. Roche, *L'irrigation et le statut juridique des eaux au Maroc*, 19 *REVUE JURIDIQUE ET POLITIQUE* 55 (1967); Daniel Martin Varisco, Sayl and Ghayl: *The Ecology of Water Allocation in Yemen*, 11 *HUMAN ECOLOGY* 365, 366-67 (1983); Michèle Zirari Devif, *The Law of Small- and Large-Scale Hydraulics in Morocco*, in *LEGAL, POLITICAL AND COMMERCIAL IMPLICATIONS*, *supra*, at 139.

268. See TALMUD BAVLI SHABBAT 121b.

matters. The contemporary Israeli water law also treats water as a community resource rather than as private property.²⁶⁹

That all potential participants share a tradition of centralized management of water for the benefit of the entire community suggests that integrated management on a regional basis could be accepted by the several national communities. In addition, despite the hostilities between and within these nations which might lead one to expect fighting rather than sharing to be the normal response to water crisis, there is in fact considerable evidence that water is simply too important to fight over.²⁷⁰ Perhaps nowhere has this been demonstrated more dramatically than in the relations of India and Pakistan. The two states have engaged in three full-scale, albeit limited, wars since 1948, as well as numerous other skirmishes and serious threats of war.²⁷¹ Yet during this same period, India and Pakistan negotiated and implemented a cooperative management scheme for the waters of the Indus Valley.²⁷² And in each outbreak of war, they did not target water facilities or interfere in the operations of the water arrangements.²⁷³

Each national community sharing the Fertile Crescent should recognize that it will receive significant benefits from the integrated management scheme.²⁷⁴ If the do so, they can be expected to discover the necessary steps to accommodate themselves to the requirements of the cooperative or integrated management arrangement. All that is required is some political imagination and the political will to place the needs of the community ahead of the needs of the political leadership of the community. Unfortunately, recent events in Mesopotamia suggests that both qualities might be in short supply.

269. Israeli Water Law, 13 LAWS OF THE STATE OF ISRAEL 173 (1959). See ARIEL BIN-NUN, THE LAW OF THE STATE OF ISRAEL 93-94 (1990); MEIR HETH, THE LEGAL FRAMEWORK OF ECONOMIC ACTIVITY IN ISRAEL 112 (1967); TECLAFF, *supra* note 8, at 56-59; Hirsch, *supra* note 266, at 178-82; Richard Laster, *Legal Aspects of Water Quality Management in Israel*, in WATER QUALITY MANAGEMENT UNDER CONDITIONS OF SCARCITY: ISRAEL AS A CASE STUDY 263, 264 (Hillel Shuval ed. 1980).

270. See Dellapenna, *Designing Legal Structures*, *supra* note 1, at 70-72; Dellapenna, *Treaties*, *supra* note 1, at 27-33; Dellapenna, *Jordan Valley*, *supra* note 1, at 15-19.

271. For a good, brief summary of the general hostility between India and Pakistan, see Amaury de Riencourt, *India and Pakistan in the Shadow of Afghanistan*, 61 FOR. AFF. 416 (1982).

272. See *Indus Waters Treaty*, *supra* note 189. See generally TECLAFF, *supra* note 2, at 163-165, 183-184; Baxter, *supra* note 189; Concannon, *supra* note 257.

273. See Khan, *supra* note 257.

274. see O. al-Jayyousi & G. abu-Lebdeh, *Evaluating Potential Water Conflict along the Euphrates River: Strategies for Cooperation*, in POLICY AND INSTITUTIONAL ASPECTS, *supra* note 20, at 84.