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Treaties as Instruments for Managing Internationally-Shared Water Resources: Restricted Sovereignty vs. Community of Property

*Joseph W. Dellapenna**

I. INTRODUCTION

During Operation Desert Storm, the coalition air forces targeted electric power stations, impairing water supplies for civilian and military needs. The impairment of water supplies resulted both from the incidental destruction of water storage facilities and, more importantly, from the deprivation of power from the pumping stations as a result of the coalition's bombing of Iraqi electric grids.¹ Interestingly, this effect of the war, barely noted in the popular press, has almost completely escaped the attention of scholars writing about environmental injury as a military tactic during the fortunately brief war, perhaps because the

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

For nine 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: CONFLICT OR COOPERATION?* (Thomas Naff & Ruth Matson eds. 1984). The project 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. I will contribute a volume to this series to be entitled *MIDDLE EAST WATER: THE POTENTIAL AND LIMITS OF LAW*, to be published in 1994. 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.

¹ See, e.g., Norma Greenaway, *Casualties Mount in Aftermath of "Bomb Now, Die Later War": Thousands More Will Die in Gulf as Long as Sanctions Stay in Place, Physicians' Group Warns*, *THE GAZETTE* (Montreal), July 25, 1991, at D8; Lee Hockstader, *Baghdad Residents Face Health Crisis; Fouled Water Supply Could Cause Disease*, *WASH. POST*, Mar. 4, 1991, at A15; Caryle Murphy, *Sewage Problems Surface in Baghdad: Iraqis Find Themselves Ankle-Deep in an Unpleasant Postwar Mess*, *WASH. POST*, July 6, 1991, at A1.

Iraqis considerably exaggerated the damage to their water supply.²

Similarly, both the popular press and scholarly commentary have seldom accorded much attention to the role of the long-brewing controversy over the waters of the Jordan Valley in the inability of states that share the basin to make peace with each other.³ The parties in the region certainly recognize its importance even though they themselves have tended not to speak openly of their desires and fears.⁴ Nonetheless, in November, 1992, Israel and the Kingdom of Jordan announced a written agreement on a peace treaty framework designed to lead to a comprehensive settlement of all Arab-Israeli issues.⁵ This agreement confirmed the two nations' understanding that the sharing of water, as much as the establishment of mutually agreeable land borders and the assurance of military security for the states of the region, is central to any peace treaty. After all, the impending water shortages in the Jordan River valley will place increasing pressure on all states in the basin and will be severe enough to strain negotiations concerning the sharing of waters in that small region.⁶

² John G. Heidenreich, *The Gulf War: How Many Iraqis Died?*, 90 FOREIGN POL'Y 108, 117-19 (1993). For examples of scholars who have written about "environmental warfare" without mentioning the interruption of Iraqi water supplies, see Robert Kogod Goldman, *The Legal Regime Governing the Conduct of Operation Desert Storm*, 23 U. TOL. L. REV. 363 (1992); Marc Ross, Note, *Environmental Warfare and the Persian Gulf War: Possible Remedies to Combat Intentional Destruction of the Environment*, 10 DICK. J. INT'L L. 515, 520-25 (1992); Oscar Schachter, *United Nations Law in the Gulf Conflict*, 85 AM. J. INT'L L. 452 (1991). For one of the few articles to discuss attacks on dams, see Burrus M. Carnahan, Note, *Protecting Nuclear Facilities from Military Attack: Prospects after the Gulf War*, 86 AM. J. INT'L L. 524 (1992).

³ It is interesting to note that Israel has actually signed a peace agreement only with Egypt—its sole neighbor with neither a claim to any part of the Jordan Valley nor a significant interest in the waters of the Jordan. For an examination of the role of water in the Jordan Valley conflict, see WATER IN THE MIDDLE EAST: CONFLICT OF COOPERATION? 17-62, 158-98 (Thomas Naff & Ruth Marson eds., 1984) [hereinafter WATER IN THE MIDDLE EAST]; SAMIR N. SALIBA, *THE JORDAN RIVER DISPUTE* (1968); Joseph Dellapenna, *Water in the Jordan Valley: The Potential and Limits of Law*, 5 PAL. Y.B. INT'L L. 15 (1989).

⁴ Carol Morello, *Water Scarcity Reaches Crisis Level in Mideast*, THE TIMES-PISCAYNE, Oct. 24, 1993, at A32 (stating that the water crisis in the Middle East can no longer be "blithely ignored").

⁵ Clyde Haberman, *Israel and Jordan Agree They Want Formal Treaty*, N.Y. TIMES, Nov. 2, 1992, at A3.

⁶ Israel and the Kingdom of Jordan both regularly consume water in excess of the annual recharge of the area's water sources. This problem will become more critical when Israeli restrictions on Palestinian water usage in the Occupied Territories (the West Bank and the Gaza Strip) are removed. Despite the fact that even a modest drought increases pressures on all three political units, the populations within all three continue to grow exponentially—due at least in part to a deliberate political-military strategy. See WATER IN THE MIDDLE EAST, *supra* note 3, at 17-22; SALIBA, *supra* note 3, at 32-45; Dellapenna, *supra* note 3, at 19-22; George Joffé, *The Issue of Water in the Middle East and North Africa*, in RESOURCE POLITICS: FRESHWATER AND

The September 13, 1993, accord between Israel and the Palestine Liberation Organization has reflected the significance of water issues in the region. The Israeli-Palestinian accord, which did little more than provide a vague framework for further talks, was accompanied by four annexes listing matters for further negotiations.⁷ Annex III (following annexes on the conduct of elections in the Occupied Territories and on the withdrawal of Israeli forces from the Gaza Strip and Jericho) addressed issues of cooperation in economic and development programs and lists "cooperation in the field of water" as the one subject to be negotiated. A subsequently announced agenda for pursuing parallel talks between Israel and Jordan gave similar prominence to water, listing it after the need for peace and steps to assure mutual security and before such topics as borders and refugees.⁸

Water's unique status as a resource has made it a frequent object of international controversy and conflict even between friendly neighboring states.⁹ States joined in a federal union have engaged in long and bitter political and legal struggles over the waters they share.¹⁰ Similar prob-

REGIONAL RELATIONS 65, 70-71 (Caroline Thomas & Darryl Howlett eds., 1993).

⁷ *The Text: "Put an End to Decades of Confrontation and Conflict,"* N.Y. TIMES, Sept. 1, 1993, at A8.

⁸ *Israel and Jordan Plan Talks: Text of the Informal Agenda,* N.Y. TIMES, Sept. 13, 1993, at A12.

⁹ For example, the United States and Canada, notwithstanding the highly successful operations of the International Joint Commission on Boundary Waters, have struggled with apparently endless disputes over the Great Lakes and other shared waters. See generally JOHN KRUTILLA, *THE COLUMBIA RIVER TREATY: THE ECONOMICS OF AN INTERNATIONAL RIVER BASIN DEVELOPMENT* (1967); DON C. PIPER, *THE INTERNATIONAL LAW OF THE GREAT LAKES* (1967); Ralph Johnson, *The Columbia Basin, in THE LAW OF INTERNATIONAL DRAINAGE BASINS* 167 (Albert Garretson et al. eds., 1967); Symposium, *U.S.-Canada Transboundary Resource Issues*, 26 NAT. RESOURCES J. 201 (1986) [hereinafter Symposium]; Albert E. Utton, *Canadian International Waters, in 5 WATERS AND WATER RIGHTS* 45 (Robert E. Beck ed., 1991).

¹⁰ These struggles within the United States have involved the interests of states, the federal government, American Indian tribes, other public and private entities, and foreign nations. See *Texas v. New Mexico*, 482 U.S. 124 (1987) *aff'g special master recommendation*, 485 U.S. 388 (1988); *Colorado v. New Mexico*, 467 U.S. 310 (1984); *Wisconsin v. Illinois*, 388 U.S. 426 (1967); *Arizona v. California*, 373 U.S. 546 (1963), *decree entered*, 376 U.S. 340 (1964), *decree amended*, 383 U.S. 268 (1966), *supplemental decree*, 439 U.S. 419 (1979), *exceptions sustained in part and overruled in part*, 460 U.S. 605 (1982), *reh'g denied*, 462 U.S. 1146 (1983), *and order amended*, 466 U.S. 144 (1984); *New Jersey v. New York*, 283 U.S. 805 (1931), *modified*, 347 U.S. 995 (1954); *Nebraska v. Wyoming*, 325 U.S. 589 (1945); *Colorado v. Kansas*, 320 U.S. 383 (1943), *reh'g denied*, 321 U.S. 803 (1944); *Wyoming v. Colorado*, 309 U.S. 572 (1940) *reh'g denied*, 310 U.S. 656 (1940); *Washington v. Oregon*, 297 U.S. 517 (1936); *Nebraska v. Wyoming*, 295 U.S. 40 (1935); *New Jersey v. New York*, 283 U.S. 336 (1931); *Connecticut v. Massachusetts*, 282 U.S. 660 (1931); *Wisconsin v. Illinois*, 281 U.S. 179 (1930); *Arizona v. California*, 283 U.S. 423 (1931); *Wyoming v. Colorado*, 259 U.S. 419 (1922) *modified* 353 U.S. 953 (1957); *Kansas v. Colorado*, 206 U.S. 46 (1907); *Missouri v. Illinois*, 200 U.S. 496

lems concerning transboundary aquifers have begun to emerge in recent years.¹¹

Yet matters are not as bad as this picture suggests. Regardless of how violent conflicts might become between states sharing a common water source, especially where water itself has played a central role in the dispute, water and water use facilities have usually been immune to military attack in the twentieth century.¹² States that are otherwise seemingly locked into apparently uncompromising and never ending enmity have nonetheless negotiated cooperative water arrangements and continued to comply with pre-existing arrangements. For example, India and Pakistan have engaged in three full-scale, albeit limited, wars since 1947, as well as numerous other skirmishes and serious threats of war.¹³ Yet, in each instance, they did not target water facilities or inter-

(1906). See generally Douglas L. Grant, *Interstate Water Allocation*, in 4 WATERS AND WATER 435, 435-650 (Robert E. Beck ed., 1991); A. Dan Tarlock, *The Law of Equitable Apportionment Revisited, Updated, and Restated*, 56 COLO. L. REV. 381 (1985).

¹¹ See generally Julio Barberis, *The Development of the International Law of Transboundary Groundwater*, 31 NAT. RESOURCES J. 167 (1991); Robert D. Hayton & Albert E. Utton, *Transboundary Groundwaters: The Bellagio Draft Treaty*, 29 NAT. RESOURCES J. 663 (1989); Ann Berkley Rodgers & Albert E. Utton, *The Ixtapa Draft Agreement Relating to the Use of Transboundary Groundwaters*, in TRANSBOUNDARY RESOURCES LAW 151 (Albert E. Utton & Ludwik A. Teclaff eds., 1987).

¹² The protection of dams is now codified in Protocol I of the Geneva Convention's Laws of War. Protocol Additional to the Geneva Convention of 12 Aug. 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I), June 8, 1977, art. 56, 16 I.L.M. 1391, 1415 (protecting "[w]orks or installations containing dangerous forces, namely dams, dykes and nuclear electrical generating stations . . ."). The importance of this protection is indicated by the inclusion of dam and dike protection in the same section that prohibits attacks on nuclear facilities. *Id.* In another words, attacks are prohibited where they would cause severe losses to civilian populations. Additionally, attacks on dams and dikes are prohibited unless the dam is used "other than for its normal function and in regular, significant and direct support of military operations and if such attack is the only feasible way to terminate such support." *Id.* Although the United States has signed the protocol, it has declined to ratify it, apparently fearing that it would appear "soft" on terrorism. See Goldman, *supra* note 2, at 385; THOMAS MERON, HUMAN RIGHTS AND HUMANITARIAN NORMS AS CUSTOMARY LAW 62-70, 74-78 (1989). See generally George H. Aldrich, *Progressive Development of the Laws of War: A Reply to Criticisms of the 1977 Geneva Protocol I*, 26 VA. J. INT'L L. 693 (1986); George H. Aldrich, *Prospects for United States Ratification of Additional Protocol I to the 1949 Geneva Conventions*, 85 AM. J. INT'L L. 1 (1991); Carnahan, *supra* note 2; Ross, *supra* note 2.

The Draft Articles prepared by the International Law Commission on the Law of Non-Navigational Use of International Watercourses also attempt to codify the practice of placing water sources and facilities off-limits to combat. *Draft Articles on the Non-Navigational Uses of International Watercourses, Draft Report of the International Law Commission*, U.N. GAOR, 43d Sess., art. 29, at U.N. Doc. A/CN.4/L.463/Add.4, (1991), reprinted in 3 COLO. J. INT'L ENV'T L. 1 (1992) [hereinafter *Draft Articles*].

¹³ Hindu-Muslim hostility in the region dates back more than one-thousand years, but was suppressed under British rule in the nineteenth and early twentieth centuries. The partition of

fere in the operations of a joint Indo-Pakistani water management administration.¹⁴ Even in the Jordan Valley, where despite more than 60 years of virtually continuous low-level conflict and occasional full-scale wars between Israel (or the Jewish settlers before the establishment of Israel) and its neighbors, tacit cooperation over water actually has remained intact—particularly between Israel and Jordan.¹⁵

Water is simply too critical a resource to fight over. Even in intense conflicts, each side realizes that depriving the enemy of the water necessary for survival is one of the few steps that could make even a significantly weaker state desperate enough to fight against any odds and to target its enemies' water facilities, facilities that would be impossible to defend against a sufficiently determined foe. The destruction of Iraqi water delivery capacity and the famous raids on German dams during World War II,¹⁶ the two primary examples of attacks on water facilities in the twentieth century,¹⁷ both occurred after, and indeed because, the

"British India" into a predominantly Hindu state (India) and a predominantly Muslim state (Pakistan) did not fully separate the two populations (not to mention numerous smaller ethno-religious groups) and resulted in conflicting claims over land, people, and water. The result has been ongoing hostility, including full-scale wars in 1947-48, 1965, and 1971. See generally Amaury de Riencourt, *India and Pakistan in the Shadow of Afghanistan*, 61 FOREIGN AFF. 416 (1982).

¹⁴ See generally Brian E. Concannon, Note, *The Indus Waters Treaty: Three Decades of Success, Yet, Will It Endure?*, 1 GEO. INT'L ENV'T'L L. REV. 55 (1989). See also LUDWIK A. TECLAFF, *THE RIVER BASIN IN HISTORY AND LAW* 163-65, 183-84 (1967) [hereinafter HISTORY AND LAW]; R.R. Baxter, *The Indus Basin*, in *THE LAW OF INTERNATIONAL DRAINAGE BASINS* 443 (A.H. Garretson et al. eds., 1967). For a summary of the treaty relationship, see *infra* notes 88-91 and accompanying text.

The reluctance of the two states to interfere with water use is all the more remarkable considering that both states have sought to acquire nuclear weapons—apparently to threaten to use against each other. See Onkar Marwah, *India and Pakistan: Nuclear Rivals in South Asia*, 35 INT'L ORG. 165 (1981); Gary Milhollin, *Stopping the Indian Bomb*, 81 AM. J. INT'L L. 593 (1987).

¹⁵ See generally ADAM GARFINKLE, *ISRAEL AND JORDAN IN THE SHADOW OF WAR* 34-40, 79-83, 116, 162-73 (1992); *ISRAEL AND ARAB WATERS: AN INTERNATIONAL SYMPOSIUM* (Abdul Majid Fared & Hussein Sarriyeh eds., 1985); Dellapenna, *supra* note 3.

This observation remains valid regardless of whether one accepts or rejects the claim that Israel's geopolitical strategy has followed an "hydraulic imperative." See, e.g., John Cooley, *Behind the News: the Hydraulic Imperative*, 205 MIDDLE EAST INT'L, July 22, 1983, at 10; Thomas Stauffer, *The Lure of the Litani*, MIDDLE EAST INT'L, July 30, 1982, at 13.

¹⁶ See PAUL BRICKHILL, *THE DAM BUSTERS* (1951) (and the memorable motion picture of the same name was based on the book).

¹⁷ Iraq's diversion of rivers during its war with Iran in the 1980's did not deprive civilians of their water; rather, it served to create "water barriers," where water was plentiful, in an attempt to stop the advancing Iranian military. Ross, *supra* note 2, at 518. Iraq's reliance on such measures was as much an indication of its desperation during the late stages of the war as it was a reflection of Saddam Hussein's egomania. See generally Margaret T. Okordudu-Fubara, *Oil in the Persian War: Legal Appraisal of an Environmental Warfare*, 23 ST. MARY'S L.J. 123

attacking side perceived that it was not reciprocally vulnerable to similar attacks on its facilities.¹⁸ The Serbian sabotaging and later shelling of the Peruca dam early in 1993 is a special case, testifying more to the irrational intensity of the fighting flowing from the collapse of Yugoslavia than a lack of reciprocal risks to the Serbs.¹⁹ Still, the Serbs and others have refrained from bombing other dams. However, the Serbs have not hesitated to cut off or attack urban and rural water supply systems in their genocidal campaign against the Bosnian Moslems.²⁰ This is yet another instance of water becoming a target (or a weapon) when there is no reciprocal risk to those doing the attacking.

Thus, despite the difficulties to be encountered in addressing the water problems in the basin of the Jordan River and elsewhere in the Middle East, there remains reason for optimism.²¹ International law will need to play a role in fostering cooperation over shared waters and to prevent future conflicts. International law, in many respects, is still a primitive legal system,²² and its practitioners have often been able to devise doctrinal schemes of considerable sophistication, which too often have not been translated into effective institutional arrangements.²³ The task has fallen to diplomats and politicians with predictably mixed re-

(1991).

¹⁸ There were also aerial attacks on North Korean dams during the Korean War, again without risk of reciprocal attacks on the attacker's water facilities. ROBERT F. FUTRELL, *THE UNITED STATES AIR FORCE IN KOREA 1950-1953* 627-28, 637 (1961). Surprisingly, the American's apparently indiscriminate bombing during the Vietnam War did not include attacks on dams and dikes despite the obvious vulnerability of North Vietnam's irrigated agricultural system in the Red River delta. See Goldman, *supra* note 2, at 389. This can hardly be attributed to the fear of reciprocal attacks as such attacks were no more likely to occur on American dikes and dams than they were on American roads, railroads, or hospitals.

¹⁹ See Warren Gerard, *Ecological Disaster Looms in Croatia*, *TORONTO STAR*, Jan. 31, 1993, at B4; Jonathan C. Randal, *Croats Struggle to Stop Dam Collapse: Thousands Are Imperiled, Serbs Are Accused of Detonating Charges*, *WASH. POST*, Jan. 30, 1993, at A1; Carol Williams, *Croats Rush to Drain Massive Lake Behind Dam*, *L.A. TIMES*, Jan. 30, 1993, at A4.

²⁰ See, e.g., John Pomfret, *In Sarajevo, Doctors are Powerless; Electrical Shutoff Cripples Hospital; Part of City Gets Water Again*, *WASH. POST*, July 15, 1993, at A24.

²¹ See GARFINKLE, *supra* note 15, at 34-40, 79-83, 116, 162-73; Dellapenna, *supra* note 3.

²² See H.L.A. HART, *THE CONCEPT OF LAW* 77-96 (1961); WATER IN THE MIDDLE EAST, *supra* note 3, at 157-60; MARK JANIS, *AN INTRODUCTION TO INTERNATIONAL LAW* 52-54 (2d ed. 1993); Yoram Dinstein, *International Law as a Primitive Legal System*, 19 *INT'L L. & POLITICS* 1 (1986).

²³ The United Nations is itself an excellent example. A more purely doctrinal example would be the general recognition of the high seas (including the deep ocean floor) as the "common heritage of mankind." See, e.g., ROBERT FRIEDHEIM, *NEGOTIATING THE NEW OCEAN REGIME* (1993). This could be coupled with the heretofore complete failure to create an effective management scheme for this region, leading to the appropriation of vast areas of high seas for the exclusive use of the adjoining coastal state. *Id.*

sults. Customary international law has largely failed to fulfill this need. Thus, there needs to be institution builders who, to be effective, must combine the sophisticated insights of international lawyers with the practical structures created by political actors in an effort to adopt treaties. The goal of these treaties should be to create institutions appropriate for the management of cooperative activities and the resolution of conflicts before they escalate to injurious levels.

The focus of this article is on the role bilateral or multilateral international agreements have played, and could play, in international water management.²⁴ In Section II of this article, I summarize the achievements and failures of customary international law relating to internationally-shared waters. In Section III, I describe the patterns of treaties adopted over the years to coordinate the management of internationally-shared water resources. In Section IV, I describe the agreements relating to the Nile River, the primary example of treaty management of Middle Eastern waters. In the final section, I propose an ideal pattern for water management arrangements which is derived from the numerous treaties relating to shared water bodies. This proposed institutional framework is essential to any region facing the threat of increasingly desperate water shortages.²⁵

II. SHARING INTERNATIONAL WATER RESOURCES: THE FAILURE OF CUSTOMARY INTERNATIONAL LEGAL PROCESSES

Apart from international agreements, international law operates through a body of customary law consisting of the practices of states undertaken out of a sense of legal obligation (the *opinio juris*).²⁶ Cus-

²⁴ This article provides only an outline of the largely unsatisfactory performance of customary international law in international water management. For more detailed treatment of the subject see generally WATER IN THE MIDDLE EAST, *supra* note 3; Dellapenna, *supra* note 3; Joseph W. Dellapenna, Symposium: *Environmental Rights and International Peace: Surface Water in the Iberian Peninsula; An Opportunity for Cooperation or a Source of Conflict?*, 59 TENN. L. REV. 803 (1992) [hereinafter *Surface Water*].

²⁵ See generally Dellapenna, *supra* note 3, at 40-45; Northcutt Ely & Abel Wolman, *Administration, in THE LAW OF INTERNATIONAL DRAINAGE BASINS* 124 (Albert Garretson et al. eds., 1967) (emphasizing the importance of administrative procedures to avoid water shortages); HISTORY AND LAW, *supra* note 14, at 113-203.

²⁶ See J.L. BRIERLY, *THE LAW OF NATIONS* 60 (Sir Humphrey Waldock ed., 1963). For additional background on the operation of customary international law, see generally ANTHONY D'AMATO, *THE CONCEPT OF CUSTOM IN INTERNATIONAL LAW* (1971); IAN BROWNLIE, *PRINCIPLES OF PUBLIC INTERNATIONAL LAW* 4-11 (4th ed. 1990); JANIS, *supra* note 22, at 41-54; 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 (1986); G.I. TUNKIN, *THEORY OF INTERNATIONAL LAW* 113-203 (William Butler trans., 1974); 1 J.H.W. VERZIJL, *INTERNATIONAL LAW IN HISTORICAL PERSPECTIVE* 31-47 (1968).

tomary international law (regional or general) develops through a process of claim and counterclaim between states.²⁷ Practices that crystallize as customary international law can include multilateral decisions reflected in votes in international assemblies,²⁸ decisions by international courts or international arbitrators,²⁹ or apparently unilateral actions of states.³⁰ Even treaties or other international agreements can express customary rules of international law.³¹ The writings of well-respected international law scholars, "the most highly qualified publicists" according to the Statute of the International Court of Justice,³² often contain the best evidence of what such practices are and whether those practices arise from a sense of legal obligation or from motives unrelated to law.

This brief description of customary international law presents a picture of a rather primitive legal system without specialized organs for making and enforcing law or for assuring representation in legal processes to the people most directly affected by an international dispute.³³ Despite the continuing primitive state of customary international law, it is not wholly without merit. Customary international law empowers international actors by legitimating their claims and limits the claims they are permitted to make. Because of the general absence of a neutral enforcement mechanism, however, customary international law usually has nothing better to offer for sanctioning violations than the law of the vendetta.³⁴ As a result, customary international law has proven unable

²⁷ The classic description of this process is found in Myres S. McDougal & Norbert A. Schlei, *The Hydrogen Bomb Tests in Perspective: Lawful Measures for Security*, 64 YALE L.J. 648, 655-61 (1955). See also CHARLES DE VISSHER, *THEORY AND REALITY IN INTERNATIONAL LAW* (1968).

²⁸ See, e.g., BROWNLIE, *supra* note 26, at 14-15, 30-31; JANIS, *supra* note 22, at 50-52; OSCAR SCHACHTER, *INTERNATIONAL LAW IN THEORY AND PRACTICE* 84-94 (1991); Christopher C. Joyner, *U.N. General Assembly Resolutions and International Law: Rethinking the Contemporary Dynamics of Norm-Creation*, 11 CAL. W. INT'L L.J. 445, 446-53, 457-59 (1981).

²⁹ BROWNLIE, *supra* note 26, at 19-24; JANIS, *supra* note 22, at 79-82, 140-42; LAUTERPACHT, *supra* note 26; SHABTAI ROSENNE, 2 *THE LAW AND PRACTICE OF THE INTERNATIONAL COURT* 611-13 (1965); Michael Akehurst, *The Hierarchy of the Sources in International Law*, 47 BRIT. Y.B. INT'L L. 273 (1974).

³⁰ BROWNLIE, *supra* note 26, at 5; JANIS, *supra* note 22, at 44-50.

³¹ For examples of treaties as evidence of custom being binding on non-party states, see BROWNLIE, *supra* note 26, at 11-14; JANIS, *supra* note 22, at 48-49; MYRES S. MCDUGAL ET AL., *LAW AND PUBLIC ORDER IN SPACE* 82-83, 115-19 (1963); LORD MCNAIR, *THE LAW OF TREATIES* 216-18 (1961); JULIUS STONE, *LEGAL CONTROLS IN INTERNATIONAL LAW* 135 (1954). But see F.J. BERBER, *RIVERS IN INTERNATIONAL LAW* 128-37 (R.K. Batstone trans., 1959); CHARLES CHENEY HYDE, 1 *INTERNATIONAL LAW* 10, 12 (2d ed. 1945).

³² Statute of the International Court of Justice, art. 38(1)(d), 59 Stat. 1055 (1945). See generally BROWNLIE, *supra* note 26, at 24-25; JANIS, *supra* note 22, at 79-82; LAUTERPACHT, *supra* note 26, at 23-25.

³³ See HART, *supra* note 22; JANIS, *supra* note 22; Dinstein, *supra* note 22.

³⁴ WATER IN THE MIDDLE EAST, *supra* note 3, at 161. See also Richard B. Bilder, *Some*

by itself to solve the problems that arise in the management of transboundary water resources.³⁵

A. *The Pattern of Customary Legal Claims Regarding Internationally-Shared Water Resources*

The process of claim and counterclaim, from which the customary international law of shared water resources emerges, has followed a rather definite and quite predictable pattern.³⁶ There is one rule to which all states apparently agree: only riparian states, that is, states across which, or through which, a river flows have any legal right to use the water of a river or other surface source, absent the consent by all affected riparian states.³⁷ Beyond this, however, the patterns of international claim and counterclaim diverge sharply according to the riparian status of the state making the claim.

The uppermost-riparian state initially presents a claim of "absolute territorial sovereignty,"³⁸ typically claiming the right to do whatever it chooses with the water regardless of its effect on other riparian states. Downstream states, on the other hand, generally begin with a claim to the "absolute integrity of the river" or other surface water source,³⁹

Limitations of Adjudication as an International Dispute Settlement Technique, 23 VA. J. INT'L L. 1 (1982); Richard A. Falk, *The Beirut Raid and the International Law of Retaliation*, 63 AM. J. INT'L L. 415 (1969).

³⁵ See William Van Alstyne, *The Justiciability of International River Disputes: A Study in the Case Method*, 1964 DUKE L.J. 307; *Surface Water*, *supra* note 24, at 814-22; Dellapenna, *supra* note 3, at 37-40; Albert E. Utton, *International Streams and Lakes Generally*, in 5 WATERS AND WATER RIGHTS 1-44 (Robert E. Beck ed., 1991). See also Richard A. Falk, *International Jurisdiction: Horizontal and Vertical Conceptions of Legal Order*, 32 TEMP. L.Q. 295 (1959).

³⁶ For other illustrative works on transboundary surface water law, see *Draft Articles*, *supra* note 12; BERBER, *supra* note 31; B. R. CHAUHAN, *SETTLEMENT OF INTERNATIONAL WATER LAW DISPUTES IN INTERNATIONAL DRAINAGE BASINS* (1981); GEORGE KAECKENBEECK, *INTERNATIONAL RIVERS; A MONOGRAPH BASED ON DIPLOMATIC DOCUMENTS* (1919); LUDWIK A. TECLAFF, *WATER LAW IN HISTORICAL PERSPECTIVE* (1985) [hereinafter *WATER LAW*]; Richard B. Bilder, *International Law and Natural Resources Policies*, 20 NAT. RESOURCES J. 451 (1980); Jan Hostie, *Problems of International Concerning Irrigation of Arid Lands*, 31 INT'L AFF. 61 (1955); Utton, *supra* note 35.

³⁷ *Draft Articles*, *supra* note 12, at art. 4; *WATER IN THE MIDDLE EAST*, *supra* note 3, at 166-67.

³⁸ *WATER IN THE MIDDLE EAST*, *supra* note 3, at 164-65. This theory has one of its best known expressions in a published opinion by former U.S. Attorney-General Harmon. 21 Op. Att'y Gen. 274, 281-82 (1895). The "Harmon Doctrine" has been disapproved by the U.S. State Department. See Memorandum to the Legal Advisor, Nov. 23, 1942, in 3 Whiteman DIGEST, Colorado § 13, at 953.

³⁹ *WATER IN THE MIDDLE EAST*, *supra* note 3, at 165; A.P. Lester, *River Pollution in International Law*, 57 AM. J. INT'L L. 828, 831-32 (1963).

claiming that upper-riparian states can do nothing that affects the quantity or quality of water available to the lower state. The utter incompatibility of such claims guarantees that neither claim will prevail in the end, although the process of negotiating and reaching solutions might require decades. The usual solution is found in a concept of "restricted sovereignty."⁴⁰ Not surprisingly, states wedged along a river, between other states, as both an upper and lower riparian state, are often first to embrace a theory of restricted sovereign rights. Under this theory, each state recognizes the right of all riparian states to use some water from a common source, and the obligation to manage use so as not to interfere with the similar use of other riparian states.⁴¹ The quantity of water allocated to each state under this theory is often defined by some selected historic pattern of use. Allocation of water is also occasionally based upon population, the amount of arable land, or some other objective measure. Allocation may also be based on a vague notion that each state is entitled to a "reasonable share" of the water.⁴² Restricted sovereignty has become the customary rule of international law as evidenced by international judicial and arbitral awards,⁴³ the many treaties based on the concept,⁴⁴ and the near unanimous opinions of many of the most highly-qualified scholars.⁴⁵ Furthermore, every quasi-public and public

⁴⁰ WATER IN THE MIDDLE EAST, *supra* note 3, at 165-66.

⁴¹ *Id.*

⁴² *Draft Articles, supra* note 12, at arts. 5-7.

⁴³ See, e.g., Territorial Jurisdiction of the Int'l Comm'n of the River Oder (U.K., Czech., Den., Fr., Ger., Swed. v. Pol.), 1929 P.C.I.J. (ser. A) No. 23, at 27 (Sept. 10); Lake Lanoux Case (Fr. v. Spain), 62 REV. G.E. INT'L PUB. 79 (1958), translated in 53 AM. J. INT'L L. 156, 170 (1959); Zarumilla River Arbitration (Ecuador v. Peru), reprinted in Informe del Ministro de las Relaciones Exteriores a la Nación 623 (Quito 1946), translated and cited in William L. 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 35, at 14-16 ("[T]he decisions by international tribunals . . . give significant support to the role of limited territorial sovereignty.")

⁴⁴ See, e.g., BERBER, *supra* note 31; REPORT OF THE U.N. COMMISSION FOR EUROPE: LEGAL ASPECTS OF HYDRO-ELECTRIC DEVELOPMENT OF RIVERS AND LAKES OF COMMON INTEREST, at 95-152, U.N. Doc. E/ECE/136 (1952); HERBERT ARTHUR SMITH, *THE ECONOMIC USES OF INTERNATIONAL RIVERS* (1931); Stephen Schwebel, *The Law of Non-Navigational Uses of International Watercourses*, 2 Y.B. INT'L L. COMM'N 76-82, 88-90, (1982), U.N. Doc. A/CN.4/348; Utton, *supra* note 35, at 7-14.

⁴⁵ See generally INT'L L. ASS'N., *THE HELSINKI RULES ON THE USES OF THE WATERS OF INTERNATIONAL RIVERS* (Rep. of the 52d Conf., adopted at Helsinki, Aug. 20, 1966) [hereinafter HELSINKI RULES]; BERBER, *supra* note 31, at 25, 272-74; D.P. O'CONNELL, *INTERNATIONAL LAW* 556-58 (2d ed. 1970); OPPENHEIM, *INTERNATIONAL LAW* 474-75 (Hersch Lauterpacht ed., 8th ed. 1955); SMITH, *supra* note 44, at 150-51; WATER LAW *supra* note 36, at 152; Dominique Alheritiere, *Settlement of Public International Disputes on Shared Resources: Elements of a Comparative Study of International Instruments*, in *TRANSBOUNDARY RESOURCES LAW* 139-49 (Albert E. Utton & Ludwik A. Teclaff eds., 1987); Juraj Andrassy, *L'utilization des eaux des*

international organization considering the customary legal regime governing internationally shared water resources has embraced the concept of restricted sovereignty in one form or another.⁴⁶

Restricted sovereignty ultimately rests on the concept of an international drainage basin as a coherent juridical and managerial unit, a concept widely supported by naturalists, engineers, economists, and jurists.⁴⁷ Given the importance of water to all living organisms, drainage basins often define ecosystems, which are increasingly becoming the managerial unit for international environmental planning.⁴⁸ In short, the notion of the drainage basin as a fundamental unit, although not *the* fundamental unit, of environmental management is essential if the goal of achieving the "best practicable environmental option" is to have any chance of success.⁴⁹

Any legal regime that denies these realities can only foster competition and eventually conflict. The theory of restricted sovereignty seeks to

bassins fluviaux internationaux, 16 REVUE EGYPTIENNE DE DROIT INTERNATIONAL 23 (1960) [hereinafter REVUE EGYPTIENNE]; Dante Caponera, *Patterns of Cooperation in International Water Law: Principles and Institutions*, in TRANSBOUNDARY RESOURCES LAW 1, 3-10 (Albert E. Utton & Ludwik A. Teclaff eds., 1987); Aziza Fahmi, *International River Law for Non-Navigable Rivers with Special Reference to the Nile*, 23 REVUE EGYPTIENNE 39 (1967); Schwebel, *supra* note 44, at 82-85, 87-88, 91-103; Utton, *supra* note 35, at 20-21.

⁴⁶ *Draft Articles*, *supra* note 12, at arts. 5-7; INSTITUT DE DROIT INTERNATIONAL, UTILIZATION OF NON-MARITIME INTERNATIONAL WATERS (EXCEPT FOR NAVIGATION), art. 2, 49 INSTITUT DE DROIT INT'L ANNUAIRE 2, (Sept. 4-13, 1961); INTER-AMERICAN BAR ASSOCIATION, PRINCIPLES OF LAW GOVERNING THE USES OF INTERNATIONAL RIVERS AND LAKES (1958); INTERNATIONAL LAW ASSOCIATION, RULES ON THE RELATIONSHIP BETWEEN WATER, OTHER NATURAL RESOURCES AND THE ENVIRONMENT, art. I (1980); HELSINKI RULES, *supra* note 45, at art. IV; RESTATEMENT (THIRD) OF FOREIGN RELATIONS LAW, *supra* note 26, § 601.

⁴⁷ JOHAN LAMMERS, POLLUTION OF INTERNATIONAL WATERCOURSES 18 (1984). See HISTORY AND LAW *supra* note 14; 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 ENV'T L. & POL'Y 45, 46-48 (1992).

⁴⁸ See, e.g., Convention on Biological Diversity, June 5, 1992, reprinted in 31 I.L.M. 818 Doc. UNEP/BIO.DIV/N7-INC.5/4 (1992); Convention on Wetlands of International Importance, especially as Waterfowl Habitat, concluded Feb. 2, 1971, 996 U.N.T.S. 245, 11 I.L.M. 963 (entered into force Dec. 21, 1975); *Draft Articles*, *supra* note 12, at arts. 2-23; Rio Declaration on the Environment and Development, June 3, 1992, reprinted in 31 I.L.M. 874, UNCED Doc. A/CONF.151/5/Rev. 1 (1992); Robert D. Hayton, *Observations on the International Law Commission's Draft Articles on the Non-Navigational Uses of International Watercourses: Articles 1-4*, 3 COLO. J. INT'L ENVTL. L. & POL'Y 31, 34-40 (1992); Ludwik A. Teclaff & Eileen Teclaff, *International Control of Cross-Media Pollution — An Ecosystem Approach*, 27 NAT. RESOURCES J. 21 (1987).

⁴⁹ See generally INTEGRATED POLLUTION CONTROL IN EUROPE AND IN NORTH AMERICA (Nigel Haigh & Frances Irwin eds., 1990); Lakshman Guruswamy, *Integrated Pollution Control: The Way Forward*, 7 ARIZ. J. INT'L & COMP. L. 173 (1980); Symposium, *Integrated Pollution Control*, 22 ENVTL. L. 1 (1992).

avoid conflict by allocating available water among the several riparian states although unfortunately without a universally agreed objective standard.⁵⁰

B. The Codification of the Customary International Law of Internationally-Shared Watercourses

The most recent authoritative expression of the theory of restricted sovereignty is found in the *Draft Articles on the Law of Non-Navigational Use of International Watercourses* prepared by the International Law Commission.⁵¹ The Commission is an organ of the United Nations designed to promote the "progressive codification of customary international law."⁵² The *Draft Articles* embraced both the principle of "equitable apportionment" and an obligation to avoid causing appreciable⁵³ harm to other states when submitted to the General Assembly in 1991.⁵⁴ The relevant *Draft Articles* read as follows:

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.

.....

⁵⁰ See *supra* note 42 and accompanying text.

⁵¹ See *Draft Articles*, *supra* note 12.

⁵² UNITED NATIONS, OFFICE OF PUBLIC INFORMATION, *THE WORK OF THE INTERNATIONAL LAW COMMISSION* (4th ed. 1988); see also IAN SINCLAIR, *THE INTERNATIONAL LAW COMMISSION 1* (1987).

⁵³ The International Law Commission, at its most recent working session, voted to substitute the word "significant" for "appreciable," while intending to leave the substance of the rules unaffected. No citation for this change was available at the time of publication.

⁵⁴ *Draft Articles*, *supra* note 12, at arts. 5, 7. The law of international rivers has been on the Commission's agenda since 1949, although work only began in earnest in 1971. SINCLAIR, *supra* note 52, at 27, 40. For a summary history of the Commission's work on international rivers, see James L. 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).

Article 7: Obligation not to cause appreciable harm.

Watercourse States shall utilize an international watercourse in such a way as not to cause appreciable harm to other watercourse States.⁵⁵

The several Chief Rapporteurs for the project in 1981 and 1982 acknowledged that the rule of "equitable utilization" had virtually unanimous recognition as a general rule of international law.⁵⁶ Yet, Stephen McCaffrey, the final Rapporteur, concluded that the International Law Commission intended the rule of no appreciable harm to prevail over the rule of equitable sharing.⁵⁷ Perhaps one can reach this conclusion by comparing the categorical command in article 7 with the more precatory language of article 5.⁵⁸ However, McCaffrey's conclusion ignores the express provisions of the Draft Articles:

Article 10: Relationship between uses.

- (1) In the absence of agreement or custom to the contrary, no use of an international water course enjoys priority over other uses.
- (2) In the event of a conflict between uses of an international water course, it shall be resolved with reference to the principles and factors set out in articles 5 to 7, with special regard being given to the requirements of vital human needs.⁵⁹

The asserted absolute primacy of the rule of no appreciable harm also ignores the reality of water usage. Logically, the no appreciable harm principle prohibits any meaningful use by an upper-riparian state, turning the principle into merely a variant form of the absolute integrity claim. That position, while frequently advocated by lower-riparian states, has never been adopted by actual international decision-makers.⁶⁰ Fur-

⁵⁵ *Draft Articles*, *supra* note 12.

⁵⁶ Jens Evensen, *First Report on the Law of the Non-Navigational Uses of International Watercourses*, 2 Y.B. INT'L L. COMM'N 155, 170-74 (1983), U.N. Doc. A/CN.4/367; Schwebel, *supra* note 44, at 85. See also Charles Bourne, *Principles and Planned Measures*, 3 COLO. J. INT'L ENVTL. L. & POL'Y 65, 73-77 (1992); McCaffrey, *supra* note 47, at 150-57.

⁵⁷ Stephen McCaffrey, *The Law of International Watercourses: Some Recent Developments and Unanswered Questions*, 17 DEN. J. INT'L L. & POL'Y 505, 509-10 (1989). See also Bourne, *supra* note 56, at 77-82; Günther Handl, *The International Law Commission's Draft Articles on the Law of International Watercourses (General Principles and Planned Measures): Progressive or Retrogressive Development of International Law?*, 3 COLO. J. INT'L ENVTL. L. & POL'Y 123, 129-33 (1992); Charles Odidi Okidi, "Preservation and Protection" Under the 1991 ILC Draft Articles on the Law of International Watercourses, 3 COLO. J. INT'L ENVTL. L. & POL'Y 143, 147 (1992).

⁵⁸ *Draft Articles*, *supra* note 12.

⁵⁹ *Draft Articles*, *supra* note 12, at art. 10. Article 6 describes, in highly general terms, the factors to be considered in determining whether a use is reasonable and an apportionment is equitable. *Id.* at art 6.

⁶⁰ See *supra* notes 38-39 and accompanying text.

thermore, as the state seeking to initiate a new use would generally be cast in terms of the one creating the "injury," absolute integrity favors more highly developed states at the expense of their less developed neighbors, particularly as lower basin states tend to develop earlier and faster than upper basin states.⁶¹ Such a situation is hardly conducive to achieving the developmental equity proclaimed under various United Nations banners.

One can reconcile the two rules by stressing that the no harm rule actually prohibits only "appreciable harm," "sensible harm," "significant harm," "substantial harm," or the like.⁶² These standards require a determination of whether a use of the water source represents a reasonable or equitable utilization.⁶³ As the German Federal Supreme Court stated in *The Danauversinkung Case (Württemberg v. Baden)*,⁶⁴ "[o]ne must consider not only the absolute injury caused to the neighboring State, but also the relation of the advantage gained by one to the injury caused to the other."⁶⁵ According to this view, the rule of no appreciable harm is really just a variant statement of the rule of equitable apportionment or equitable utilization under the principle of restricted sovereignty in the watersource.⁶⁶

The need for the orderly and peaceful administration of shared water resources has encouraged nations to go further than the theory of restricted sovereignty, toward a model even more restrictive of their sovereignty. The more restrictive model can fairly be described as a rule of "community of property" in the watersource.⁶⁷ Under the community of property model, a waterbasin is jointly developed and managed as a

⁶¹ Bourne, *supra* note 56, at 92. See Albert Garretson, *The Nile Basin*, in *THE LAW OF INTERNATIONAL DRAINAGE BASINS* 256, 264-65 (Albert Garretson et al. eds., 1967). See generally Westcoat, *supra* note 54, at 319-25.

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' relationship with Mexico. See, e.g., 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).

⁶² Schwebel, *supra* note 44, at 98-100.

⁶³ *Id.* at 99-107. See HELSINKI RULES, *supra* note 45, at art. X (commentary); INT'L L. ASS'N, *supra* note 46, at art. 1; McCaffrey, *supra* note 47, at 144-46; Utton, *supra* note 35, at 21-26, 43-44.

⁶⁴ Ann. Digest & Rep. of Pub. Int'l L. Cases 128 (RGst. 1927). See also Evensen, *supra* note 55, at 172-74; Schwebel, *supra* note 44, at 102.

⁶⁵ See also Bourne, *supra* note 56, at 82-92; Utton, *supra* note 35, at 26-31.

⁶⁶ See generally Ronald Coase, *The Problem of Social Cost*, 3 *J.L. & ECON.* 1 (1960).

⁶⁷ See generally WATER LAW, *supra* note 36, at ch. X; WATER IN THE MIDDLE EAST, *supra* note 3, at 171-73.

unit without regard to international borders and with an agreed sharing of the benefits of, and equitable participation in, such development and management.⁶⁸ Although full instantiation of this approach is still rare,⁶⁹ there are good reasons for believing that the practice of nations will continue to move more strongly in this direction.

Several international meetings recently adopted the principle of community of property as the goal in settling disputes over shared water resources, culminating in the recently completed *Draft Articles* of the International Law Commission.⁷⁰ The central provisions propounding the community of property model are found in articles 8 and 26 of the *Draft Articles*:

Article 8: General Obligation to Cooperate.

Watercourse States shall cooperate on the basis of sovereign equality, territorial integrity and mutual benefit in order to obtain optimal utilization and adequate protection of an international watercourse.

. . . .

Article 26: Management.

(1) Watercourse States shall, at the request of any of them, enter into consultations concerning the management of an international watercourse, which may include the establishment of a joint management mechanism.

(2) For the purpose of this article, "management" refers, in particular to:

- (a) planning the sustainable development of an international watercourse and providing for the implementation of any plans adopted, and
- (b) otherwise promoting rational and optimal utilization, protection, and control of the watercourse.⁷¹

Article 8 sets out the general duty of cooperative management.⁷² Article 26 requires good faith cooperation, with joint management as a genuine (and often necessary) option in that cooperation.⁷³ These articles contemplate an obligation of active cooperation on the part of ripar-

⁶⁸ L.F.E. Goldie, *Equity and the International Management of Transboundary Resources*, in *TRANSBOUNDARY RESOURCES LAW* 103-37 (Albert E. Utton & Ludwik A. Teclaff eds., 1987); Utton, *supra* note 33, at 6.

⁶⁹ See, e.g., Treaty for Amazonian Co-operation, July 3, 1978, art. I, reprinted in 17 I.L.M. 1046; Evensen, *supra* note 56, at 169-74.

⁷⁰ *Draft Articles*, *supra* note 12, at arts. 8-19, 26, 27. See generally Utton, *supra* note 35, at 38-43 (analyzing the *Draft Articles*).

⁷¹ *Draft Articles*, *supra* note 12, at arts. 8, 26.

⁷² *Id.* at art. 8.

⁷³ *Id.* at art. 26.

ian states, rather than a mere partition of the waters. The articles, however, do not establish how this cooperation is to be realized. Given the multifarious variations in waterbasins across the globe, a universal treaty perhaps could do no more to improve the situation.

An obligation of cooperative management cannot be realized simply through customary law processes. Active and ongoing managerial cooperation requires a formal legal framework that can only be created by a treaty which establishes the duties and responsibilities of all of the parties.

III. THE EVOLUTION OF TREATY PRACTICE

By 1950, states had entered into nearly 100 treaties based on the rule of restricted sovereignty for their shared waters and more such treaties have followed.⁷⁴ The foregoing general conclusions describe in abstract terms the transition of treaty practice from the model of restricted sovereignty (equitable apportionment) to the theory of community of property (equitable participation). In this section, I summarize actual treaty practice, beginning with agreements that barely acknowledge the interest of neighboring states in the shared waters and ending with an examination of the extensive arrangements of joint development and management of the resource. Although I arrange treaty practice in the order of its logical succession, the reader should note that in real time these agreements did not always follow the evolutionary sequence provided here. The needs of the time dictated the development and sophistication of the agreement. Thus, some instances required active joint management, for example, before the less developed agreements to share information or allocate water had even been considered.

A. *Stopping Short of Allocating Water between the Riparian States*

The simplest arrangement recognizing the interrelationship of water uses in states adjacent to an internationally shared waterbody or lying in succession along the waterbody is a commitment to share information about the uses in the several states. Such an agreement, by enabling water users to consider existing or planned uses elsewhere on the waterbody, could reduce direct conflicts. A relatively early example is the Portuguese-Spanish convention of 1866 that required consultations before either signatory licensed a private hydraulic work on the international reaches of transboundary rivers.⁷⁵

⁷⁴ See BERBER, *supra* note 31; COMMISSION REPORT, *supra* note 44, at 95-152; Utton, *supra* note 35, at 7-14.

⁷⁵ Boundary Treaty, Sept. 29, 1864, Spain-Port., Annex Agreement on Regulation of Bound-

Such agreements have extremely limited utility. Merely sharing information is only helpful when there is enough water available to satisfy all, or nearly all, potential users. When water is chronically in short supply and there is no agreed arrangement for determining which uses are to be preferred over other uses; agreements providing for the sharing of information will fail to prevent or resolve conflicts between users or their governments. Such agreements might even exacerbate conflict if one of the parties seeks to evade its obligations, thereby augmenting distrust and its accompanying tension.⁷⁶ Information sharing agreements have thus tended to give way to agreements designed, at the least, to prevent direct conflicts between competing hydraulic projects.

The first step towards preventing such direct conflicts, and the next step in developing the notion of restricted sovereignty, is simply to agree that no hydraulic project can be undertaken in either state without the consent of the other if the proposed project would sensibly impair the waterbody, or at least sensibly interfere with the water's uses in the other state. An early example is the 1905 agreement between Norway and Sweden regarding their shared watercourses.⁷⁷ The agreement between the United States and Canada to create a Joint Boundary Waters Commission to approve works in either state that would likely affect persons in the other state carries the process one step further because, although each state has equal representation on the Commission, the members are not bound directly by their government's instructions.⁷⁸ A multilateral agreement binding the signatory states "to refrain from all measures likely to prejudice the navigability" of waterways was signed

ary Waters, Nov. 20, 1866, 129 Consol. T.S. 453, 455 [hereinafter Boundary Waters Agreement]. See also Frontier Treaty, Dec. 12, 1928, Aus.-Czech., art. 28(3), 108 L.N.T.S. 57 [hereinafter Aus.-Czech. Frontier Treaty].

⁷⁶ Perhaps the best example is the continuing charges by Arab states that Israel has not complied with the ambiguous provisions of Jordan River water consumption agreements. See, e.g., GARFINKLE, *supra* note 15, at 40, 164-69; Douglas Davis, *Future Water Shortages Threaten Middle East Peace*, JERUSALEM POST, May 25, 1990 available in LEXIS, Nexis Library, JPOST File; Joffé, *supra* note 6, at 73; Mahmoud Riyadh, *Israel and the Arab Water in Historical Perspective*, in ISRAEL AND ARAB WATER 10 (Abdel Majid Farid & Hussein Sirriyeh eds., 1985). Similar difficulties emerged during the period between the partition of the Indus Valley between India and Pakistan and the subsequent agreement on dividing the waters. See Baxter, *supra* note 14, at 451-53, 459-60.

⁷⁷ Convention concernant les lacs et cours de l'eau communs, Oct. 26, 1905, Nor.-Swed., 34 MARTENS NOUVEAU RECUEIL (2e ser.) 711 [hereinafter Lake Convention]. See also Convention on Certain Questions Relating to the Law on Watercourses, May 11, 1929, Swed.-Nor., art. 12(1), 120 L.N.T.S. 277, 281 [hereinafter Swedish-Norwegian Convention].

⁷⁸ Boundary Waters Treaty, Jan. 11, 1909, U.S.-Gr. Brit., arts. III, IV, IX, X, 36 Stat. 2449, T.S. 548; Treaty for the Co-Operative Development of the Columbia River Basin, Jan. 17, 1961, U.S.-Can., arts. XIV, XVI, 15 U.S.T. 1555, [hereinafter Columbia Basin Treaty]. See generally Utton, *Canadian International Waters*, *supra* note 9.

by twenty states in 1921, but ultimately was ratified by only five states (including the British Empire).⁷⁹ A similar principle was subsequently incorporated into a multilateral convention on hydroelectric works affecting more than one state.⁸⁰

Agreements not permitting new works without obtaining another interested state's consent allow easy solutions to conflicting plans when water is fairly plentiful and both states have the ability to grant one another consent. Such success is often signalled by a succession of agreements, each apparently of limited import but cumulatively representing a high degree of joint development of a basin's water resources.⁸¹ When water is scarce relative to demand, the need to secure consent to every significant change in water use can simply paralyze further development of the resource. Unless this is the goal sought (as in the Anglo-Italian agreement on the Atbara),⁸² such an agreement quickly ceases to be an acceptable solution and attempts to evade its provisions will breed suspicion and hostility.

B. *Allocating Water Between States*

The threat of paralysis to the development of water resources through agreements requiring mutual consent leads to another type of arrangement: that is, agreements to divide the transboundary waters by volume. Such agreements have been made as successors to earlier agreements to inform, consult, or approve hydraulic works on transboundary waters, often when developing technology made the harnessing of a common river's hydroelectric potential increasingly attractive. As a result, agreements allocating transboundary waters by volume or otherwise

⁷⁹ Convention Regulating Navigable Waterways of International Concern, Apr. 20, 1921, art. 10, 7 L.N.T.S. 35 [hereinafter Convention on Navigable Waterways].

⁸⁰ General Convention Relating to the Development of Hydraulic Power Affecting More than One State, Dec. 9, 1923, art. 4, 36 L.N.T.S. 76,81 [hereinafter Convention on Hydraulic Power].

⁸¹ For example, such is the situation between Canada and the United States concerning the Great Lakes-St. Lawrence basin and the Columbia River basin. See WATER LAW, *supra* note 36, at 428-29, 438-43, 458-61; Utton, *supra* note 9. The Rhine is controlled by a similar regime. WATER LAW, *supra* note 36, at 450-51 n.28. See also George Radosevich, *Implementation: Joint Institutional Management and Remedies in Domestic Tribunals (Articles 26-28, 30-32)*, 3 COLO. J. INT'L ENVTL. L. & POL'Y 261, 263-66 (1992) (describing the evolution of the less successful Mekong Committee).

⁸² For a description of the early and inadequate agreements limiting Ethiopia's right to develop the waters of the Atbara and the Blue Nile, see R.K. Batstone, *The Utilisation of the Nile Waters*, 8 INT'L & COMP. L.Q. 523, 551-55 (1959); Garretson, *supra* note 61, at 291-92; Sayed Hosni, *The Nile Regime*, 17 REVUE EGYPTIENNE DE DROIT INT'L 70, 89-91 (1961); C.O. Okidi, *Review of Treaties on Consumptive Utilization of Waters of Lake Victoria and Nile Drainage System*, 22 NAT. RESOURCES J. 161, 192-93 (1982).

have become quite common as instantiations of the theory of restricted sovereignty, sometimes coupled with a requirement that any works potentially interfering with the rights of a party to the agreement cannot be undertaken without the other party's consent.

Agreements to allocate the hydroelectric potential of a waterbody distribute either the waters available at power sites or the power to be produced by a single facility or concessionaire. For example, Portugal and Spain agreed to a convention in 1927 dividing the international portion of the Duoro River into two parts, with Spain to exploit the hydroelectric potential of the first part and Portugal the hydroelectric potential of the second part.⁸³ This Convention, still in effect, also contains guarantees of minimum flows⁸⁴ and establishes an International Joint Commission.⁸⁵ The Commission serves as a channel to share information about the development of the hydroelectric potential of the international reaches of the transboundary rivers, and is also empowered to decide whether proposed works are compatible with the Convention's provisions. The Commission's unanimous decisions are immediately binding on the states, but majority decisions must be approved by the two governments.⁸⁶ Approval is presumed if neither government objects within thirty days of the decision's communication to the governments.⁸⁷ The Duoro Convention also provides for recourse to the International Court of Justice should the parties fail to agree.⁸⁸ No such proceeding has ever been brought, however, and the agreement makes no provision for the implementation of a judicial award.

Some allocation agreements seek to achieve the desired goal by specifying the amount of water that must be left in the water source and not by specifying the amount of water that might be diverted.⁸⁹ The

⁸³ Convention to Regulate the Hydro-Electric Development of the International Section of the River Duoro, Aug. 11, 1927, Spain-Port., art. 1-2, 82 L.N.T.S. 131, 133 [hereinafter Duoro Convention]. See *Surface Water*, *supra* note 24, at 813.

⁸⁴ Duoro Convention, *supra* note 83, at arts. 8, 18.

⁸⁵ *Id.* at art. 14. Portugal and Spain agreed in 1964 to extend the authority of the International Joint Commission over other sorts of hydraulic works and introduced a measure of flexibility in the sharing of the hydroelectric potential of the Duoro River. *Surface Water*, *supra* note 24, at 813. The powers of the International Joint Commission to guarantee minimum flows were extended to the Guadiana River in 1968. *Id.*

⁸⁶ Duoro Convention, *supra* note 83, at art. 16.

⁸⁷ *Id.*

⁸⁸ *Id.* at art. 21.

⁸⁹ See, e.g., Treaty Relating to Uses of the Waters of the Niagara River, Feb. 27, 1950, U.S.-Can., arts. 4, 6, 1 U.S.T. 694; Convention du Rhone pour l'aménagement de la puissance hydraulique, Oct. 4, 1913, Fr.-Switz., art. 5, 5 MARTENS NOUVEAU RECUEIL (3e ser.) 291 [hereinafter Rhone Convention]; Convention concernant l'aménagement de la chute du Doubs pres de Chatelot, Nov. 19, 1930, Fr.-Switz., art. 5, 26 MARTENS NOUVEAU RECUEIL (3e ser.) 314

United States has largely resolved its long-standing disputes with Mexico by entering a series of agreements obligating the United States to deliver specific quantities of water to the Mexican border and by creating an International Joint Commission to construct hydraulic works on the international reaches of the shared rivers.⁹⁰ In a 1961 agreement, India and Pakistan used a version of this approach as a means of avoiding both continuing disputes and joint management by agreeing to divide their shared waters by source stream, giving each state the exclusive use of certain tributaries of the Indus River.⁹¹ The effect of the Indus Waters Treaty was to require Pakistan to construct a new canal system to shift its reliance from the rivers assigned to India to rivers that had hitherto been less developed. The deal became possible because India agreed to underwrite the expenses of Pakistan's new canals,⁹² although the money was actually provided by a development fund administered by the World Bank.⁹³ The Indus Waters Treaty also imposed an obligation to exchange information and provided for mutual inspection to assure compliance, subject to binding arbitration of technical questions.⁹⁴

C. *Jointly Managing Internationally-Shared Waters*

As the foregoing brief review of agreements partitioning water resources suggests, creative use of such agreements can resolve many potential controversies over shared waters with a minimum of ongoing active cooperation. Such agreements ultimately remain unsatisfactory as the ensuing unilateral activities by the parties to the partition can only coincidentally optimize the utilization of the resource. As a panel of experts appointed by the Secretary-General of the United Nations concluded in 1957:

It is now widely recognized that individual water projects — whether

[hereinafter *Doubs Convention*].

⁹⁰ Convention Providing for the Equitable Distribution of the Waters of the Rio Grande for Irrigation Purposes, May 21, 1906, U.S.-Mex., 34 Stat. 2953; Treaty Respecting Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande, Feb. 3, 1944, U.S.-Mex., 59 Stat. 1219 [hereinafter *Water Utilization Treaty*]. See also WATER LAW, *supra* note 36, at 429-33; Albert E. Utton, *Mexican International Waters*, in 5 WATERS AND WATER RIGHTS 95 (Robert E. Beck ed., 1991).

⁹¹ Indus Waters Treaty, Sept. 19, 1960, India-Pak., art. II, 419 U.N.T.S. 126.

⁹² *Id.* at art. IV.

⁹³ For a detailed description of the World Bank's role, see Baxter, *supra* note 14, at 457-78. See generally HISTORY AND LAWS, *supra* note 14, at 163-65, 183-84; WATER LAW, *supra* note 36, at 436-38; Concannon, *supra* note 14.

⁹⁴ Indus Waters Treaty, *supra* note 91, at arts. VIII, IX.

single or multipurpose — cannot as a rule be undertaken with optimum benefit for the people affected before there is at least the broad outlines of a plan for the entire drainage area.⁹⁵

Allocation agreements often require frequent negotiation of new arrangements in order to attempt at least temporary optimization of use of the resource. This has proven true in developing the hydroelectric potential of the Niagara and Columbia Rivers in the United States and Canada,⁹⁶ and in resolving recurring disputes between the United States and Mexico over the quality of water delivered pursuant the American treaty obligations.⁹⁷ The process of negotiating supplemental agreements, at best, consumes time and money; at worst, important projects might never be undertaken because the cost of reaching agreement is prohibitive.⁹⁸ The resulting frustrations can fuel controversy rather than calm it.

IV. THE NILE RIVER REGIME⁹⁹

The Nile River has brought life-giving waters through the heart of the north African desert for millennia, and has been relied on by farmers and others in Egypt and Nubia since time immemorial.¹⁰⁰ The Nile has also been a significant limiting factor because, while it is the longest river in the world, it has the smallest average discharge at its mouth among the nine longest rivers of the world.¹⁰¹ The Nile is the quintessential "exotic river," receiving no inflows of tributary water and negligible rainfall for approximately the last 3,000 kilometers of its 6,825-kilometer length, and it steadily loses water as it cuts across the

⁹⁵ *Integrated River Basin Development*, U.N. Dep't of Econ. & Soc. Aff., U.N. Doc. E/3066/Rev. 1, at 1 (1958).

⁹⁶ KRUTILLA, *supra* note 9, at 197; WATER LAW, *supra* note 36, at 428-29, 438-43; Johnson, *supra* note 9, at 234-41 (discussing the Columbia River Basin); Symposium, *supra* note 9; Utton, *supra* note 9, at 73-77.

⁹⁷ WATER LAW, *supra* note 36, at 429-33.

⁹⁸ Almost any development involving international cooperation could be selected as an example of increased expense and inordinate delay. The numerous and unrealized proposals to develop the Yarmuk River is an example of projects never built because of failure to reach agreement. See GARFINKLE, *supra* note 15, at 39-40, 164-69, 184-85; WATER IN THE MIDDLE EAST, *supra* note 3, at 43-47, 50-53; Leslie Schmida, *Israeli Water Projects and Their Repercussions on the Arab-Israeli Conflict*, in ISRAEL AND ARAB WATER 25, 27-28 (Abdel Majid Farid & Hussein Sirriyeh eds., 1985).

⁹⁹ See generally HISTORY AND LAW, *supra* note 14, at 105-08, 112-15; WATER LAW, *supra* note 36, at 433-36; JOHN WATERBURY, *HYDROPOLITICS OF THE NILE VALLEY* (1979); Okidi, *supra* note 82.

¹⁰⁰ WATERBURY, *supra* note 99, at 12-13, 25-32.

¹⁰¹ *Id.* at 21.

eastern Sahara to the Mediterranean Sea.¹⁰²

The technology for irrigation and other consumptive uses has long remained undeveloped, preventing any serious drawdown of the river.¹⁰³ In fact, well into this century, the major form of irrigation in the Nile Valley remained the annual floods.¹⁰⁴ With the advent in Egypt of low-level dams ("barrages") in the mid-nineteenth century¹⁰⁵ and of modern hydraulic works, most notably the Aswan High Dam,¹⁰⁶ in the twentieth century, attention inevitably turned to protecting the flow of water on which these facilities depended.

Gaining political control of the upper reaches of the Nile was not as difficult in the nineteenth century as it would be today. The British, after gaining effective control of Egypt in 1882, struggled for nearly two decades to subdue the sparsely populated Sudan, and raced other colonial powers to find and secure control of the Nile's headwaters.¹⁰⁷ Although they did not quite succeed with the latter, they did secure the headwaters in Uganda, and obtained sovereign control over nearly the whole Nile valley. The British then obtained, by treaty, the agreement of the Congo Free State, Ethiopia, and Italy (the other states controlling various sources of the Nile) not to change the flow of the Nile's waters without British consent.¹⁰⁸ Thereafter, the British authorities undertook works to extend irrigation in Sudan while assuring water supplies to Egypt.¹⁰⁹

Financial considerations precluded work on the Egyptian portions of the planned works even after the Sudanese works were finished in 1925; instead, Egyptian needs were secured by the British administration of the Sennar Dam in Sudan.¹¹⁰ When the British Governor-General of Sudan

¹⁰² *Id.* at 18-19.

¹⁰³ See, e.g., Ludwik A. Teclaff, *Fiat or Custom: The Checkered Development of International Water Law*, 31 NAT. RESOURCES J. 45, 63 (1991).

¹⁰⁴ WATERBURY, *supra* note 99, at 19-32.

¹⁰⁵ *Id.* at 32-42. See also Garretson, *supra* note 61, at 264-67.

¹⁰⁶ WATERBURY, *supra* note 99, at 87-89, 94-153; Garretson, *supra* note 61, at 274-76.

¹⁰⁷ WATERBURY, *supra* note 99, at 43-47.

¹⁰⁸ Protocol Delimiting Spheres of Influence in East Africa, Apr. 15, 1891, Gr. Brit.-Italy, art. 3, reprinted in 83 BRIT. & FOR. STATE PAPERS 21; Treaties Relative to the Frontiers Between the Sudan, Ethiopia, and Eritrea, May 15, 1902, U.K.-Eth.-Italy, art. 3, 1902 G.B.T.S. No. 16 (Cmd. 1370); Agreement Relating to the Boundaries of the Sudan, May 9, 1906, U.K.-Congo, art. 3, 1906 G.B.T.S. No. 4 (Cmd. 2920). See Batstone, *supra* note 82, at 533-37; Garretson, *supra* note 61, at 277-78; Hosni, *supra* note 82, at 71-73; Okidi, *supra* note 82, at 167-70.

¹⁰⁹ Nile Commission, 1925 Report, § 10-13, in 21 MARTENS NOUVEAU RECUEIL (3e ser.) 101; WATER LAW, *supra* note 36, at 433-34; Garretson, *supra* note 61, at 267-70, 278-84; Hosni, *supra* note 82, at 73-80.

¹¹⁰ SMITH, *supra* note 44, at 77; WATER LAW, *supra* note 36, at 434; Garretson, *supra* note

was murdered in Cairo in 1924 during nationalist unrest, motivated in part by a demand for the incorporation of Sudan into Egypt, the British reacted in part by threatening to permit unlimited Sudanese irrigation. Eventually, the British and Egyptian governments reached an agreement in 1929 assuring continued British control of Sudan predicated on Sudan's subordination to Egypt's dominant position on the Nile.¹¹¹

As soon as Sudanese independence was assured in 1953,¹¹² the Sudanese government demanded modification of the 1929 agreement as too restrictive of Sudanese development.¹¹³ Sudan particularly objected to the planned Aswan High Dam, as it would flood parts of Sudan and also require Egyptian approval before new works could be constructed in Sudan.¹¹⁴ A new treaty ratified in 1959 settled most outstanding questions between the two countries.¹¹⁵

The 1959 Treaty included reciprocal consent to new dams in each country: the High Dam at Aswan in Egypt and a new dam on the Blue Nile in Sudan.¹¹⁶ More importantly, the Treaty allocated the flow of the Nile between the two states: 48 billion cubic meters (BCM) to Egypt and 4 BCM to Sudan, both measured at Aswan.¹¹⁷ "Surplus" water from the Sudd, a large swamp in the south of Sudan, was allocated more favorably to Sudan: up 14.5 BCM to Sudan and only 7.5 BCM to Egypt.¹¹⁸ The Treaty further committed Sudan to undertake additional reclamation works in upper Sudan, with the water reclaimed to be allocated equally to the two nations.¹¹⁹ Finally, the two nations, which termed the Treaty as one for "the Full Utilization of the Nile Waters," sought to present a united front to other Nile basin states through the following remarkable clause:

[B]oth republics agree to study together [the claims of other Nile basin

61, at 282-83; Hosni, *supra* note 82, at 79.

¹¹¹ SMITH, *supra* note 44, at 70-71; WATERBURY, *supra* note 99, at 63-67; Batstone, *supra* note 82, at 523-33; Garretson, *supra* note 61, at 284-86; Hosni, *supra* note 81, at 80-87; Okidi, *supra* note 82, at 170-76.

¹¹² Agreement Concerning Self-Government and Self-Determination for the Sudan, Feb. 12, 1953, Egypt-Gr. Brit., 161 U.N.T.S. 157. See generally WATERBURY, *supra* note 99, at 48-55.

¹¹³ WATERBURY, *supra* note 99, at 67-77.

¹¹⁴ Batstone, *supra* note 82, at 540, 547-50; Garretson, *supra* note 61, at 286-92; Hosni, *supra* note 82, at 91-99; Okidi, *supra* note 82, at 181-85.

¹¹⁵ Agreement on the Full Utilization of the Nile Waters, Nov. 8, 1959, U.A.E.-Sudan, 453 U.N.T.S. 51, reprinted in 15 REVUE EGYPTIENNE 321 (1959) [hereinafter Nile Treaty].

¹¹⁶ *Id.* at art. 2.

¹¹⁷ *Id.* at art. 1.

¹¹⁸ *Id.* at art. 2.

¹¹⁹ *Id.* at art. 3.

states] and adopt a unified view thereon. If such studies result in the possibility of allotting an amount of water to one or the other of these territories, then the value of this amount as Aswan shall be reduced in equal shares from the share of each of the two Republics.¹²⁰

The Treaty solved the problems of the two countries, although the Sudanese have complained about "shortages in the midst of plenty."¹²¹ Continuing population growth has made the problems of inadequate water supplies a pressing one even in Egypt,¹²² something unimagined when the 1959 Treaty was signed. The hydrogeology of the Nile Valley is such that activities in Burundi, the Central African Republic, Kenya, Rwanda, Tanzania, Uganda, and Zaire, the uppermost states on the White Nile, are unlikely to affect Egypt or Sudan north of the Sudd.¹²³

The Blue Nile presents a rather different picture. The Blue Nile, arising in the highlands of Ethiopia, contributes the major, but highly variable, flow of the Nile in northern Sudan and Egypt: between seventy-five and ninety per cent of the flow that reaches Egypt comes from Ethiopia.¹²⁴ Indeed, a good deal of the White Nile's flow in so far as it reaches the northern Sudan and Egypt, also arises in Ethiopia.¹²⁵ Continuing political turmoil in Ethiopia has prevented it from developing the Nile's waters before those waters leave the country. If the present or a successor regime succeeds in stabilizing the country and undertaking major development projects, however, this picture will change.¹²⁶ Egypt

¹²⁰ *Id.* at art. 5. Since then, the two states have taken further steps to integrate their economies and have made occasional gestures towards integrating their governments.

¹²¹ See generally WATERBURY, *supra* note 99, at 174-210, 231-41; Abdin M.A. Salih, *The Nile Inside the Sudan — Increasing Demands and Their Consequences*, 10 WATER INT'L 73 (1985); Bret Wallach, *Irrigation in Sudan Since Independence*, 78 GEOGRAPHICAL REV. 417 (1988).

¹²² See WATERBURY, *supra* note 99, at 118-19, 151-53, 213-31; *The Nile; A Grasping Serpent*, THE ECONOMIST, Feb. 27, 1988, at 74.

¹²³ WATERBURY, *supra* note 99, at 14-17, 23-24; Okidi, *supra* note 82, at 164-65, 189-98. Even when projects are designed that might produce significant water from the Sudd, the continuing civil disorder in Southern Sudan prevents their implementation. Kathryn Davies, *Egypt, Sudan in Nile Talks*, THE GUARDIAN (London), May 31, 1985, at 7; Okidi, *supra* note 82, at 191-92. These realities have not prevented Egypt from attempting to control what development occurs in the uppermost states on the White Nile. Garretson, *supra* note 61, at 286; Hosni, *supra* note 82, at 87-89; Okidi, *supra* note 82, at 176-81, 185-89.

¹²⁴ WATERBURY, *supra* note 99, at 17-19; Gamal Moursi Badr, *The Nile Waters Question: Background and Recent Developments*, 15 REVUE EGYPTIENNE 94, 95 (1959); Garretson, *supra* note 61, at 259; Okidi, *supra* note 82, at 164.

¹²⁵ Garretson, *supra* note 61, at 259-60, 264.

¹²⁶ See, e.g., Assem Abdul Mohsen, *Egypt, Ethiopia Clash over the Nile*, THE MIDDLE EAST, Sept. 1980, at 70. For a description of the early and inadequate agreements limiting Ethiopia's right to develop the waters of the Atbara and the Blue Nile, see Batstone, *supra* note 82, at

and Sudan, on the other hand, will insist that Ethiopia undertake no works that inflict "appreciable harm" on their existing activities, basing their claims on the customary international law as expressed in the Draft Articles published by the International Law Commission.¹²⁷

The impending struggles over the waters of the Nile follow the patterns that have been found in river basins worldwide. As is generally the case, development in the Nile basin occurred earlier and faster in the lower basin than in the upper-basin.¹²⁸ This creates a set of existing users who demand protection for their "prior rights" and a class of disadvantaged potential users upstream who demand developmental equity. Developmental disparities frequently establish a pattern whereby lower-basin water users have military power to enforce their will, while the upper-basin users have the water and the ability to cut it off or contaminate it. The resulting tension can be managed only if the water is controlled in such a way as to assure the equitable participation of all states sharing the basin.¹²⁹ As R.K. Batstone and others foresaw as early as 1959, the very year the treaty was signed, only by reworking the Nile regime into a coordinated regional management authority can the basin's problems possibly be solved.¹³⁰

V. IMPLEMENTING COMMUNAL (JOINT) MANAGEMENT

Comprehensive management is necessary to optimize water use—particularly in arid climates like the Middle East and North Africa. Comprehensive management of an internationally divided water basin, like in the Jordan Valley, requires joint or communal management. Perhaps more importantly, it also creates an opportunity for political benefits to be achieved through cooperation rather than conflict.¹³¹ Long-term solutions for the needs of the people in the Jordan Valley will require a regional mechanism to avert debilitating competition.¹³² If the importation of water from outside the Jordan Valley becomes necessary,¹³³ the need for the optimum use of imported water, together

551-55; Garretson, *supra* note 61 at 291-92; Hosni, *supra* note 82, at 89-91; Okidi, *supra* note 82, at 192-93.

¹²⁷ *Draft Articles, supra* note 12, at art. 7.

¹²⁸ The occasional exceptions result from the colonization of the upper basin by a technologically more developed culture from outside the region, while the lower basin remains in the possession of the earlier culture. Perhaps the most notable example is the United States' actions on the Colorado River and the Rio Grande relative to Mexico. *See, e.g., Székely, supra* note 61.

¹²⁹ *See generally* Utton, *supra* note 35, at 38-43.

¹³⁰ Batstone, *supra* note 82, at 555-58. *See also* Okidi, *supra* note 82, at 184-89, 198-99.

¹³¹ *See* GARFINKLE, *supra* note 15; Dellapenna, *supra* note 3.

¹³² The truth of this is illustrated by the importance accorded water in the ongoing peace talks. *See supra* notes 9-10 and accompanying text.

¹³³ Several such proposals have been seriously entertained in recent years. *See, e.g.,* JOYCE R.

with locally available water, will underscore the necessity of regional cooperation. The states of the Nile basin, or at least Egypt, Ethiopia, and Sudan, will soon face similar situations.

The essential elements of such a communal management arrangement are easy to describe in general terms, but remain difficult to negotiate or implement in detail. The basic terms of such an agreement would be based on recognizing that the basin states form a community united by their common property in shared water resources (hence the term "community of property"). This concept is realized by:

- a. developing and managing the water basin as a unit without regard to international borders, ideally through a joint transnational institutional structure;
- b. sharing the benefits of that development and management according to an agreed formula or procedure; and
- c. establishing a procedure for constructive investigation and peaceful resolution of disputes.

Such principles have long been recognized by the United Nations, beginning even before the Committee of Experts called for communal management of water basins in 1957. The United Nations continues to promote communal management at virtually every opportunity.¹³⁴ Perhaps the most succinct and emphatic statement of this policy 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, Ceylon, in 1960: "River basin development projects are now necessarily multipurpose and lead to unified development."¹³⁵ The final report of the U.N. Water Conference at Mar del Plata in 1977 also endorsed this approach: "It is necessary for States to cooperate in the case of shared water resources in recognition of the growing economic, environmental and physical interdependencies across international frontiers. Such cooperation . . . must be exercised on the basis of the equality, sovereignty and territorial integrity of all States."¹³⁶ The concept that internationally-shared waters create a community of states sharing property in the water was also ex-

STARR & DANIEL C. STOLL, U.S. FOREIGN POLICY ON WATER RESOURCES IN THE MIDDLE EAST (1987); Joyce Starr, *Water Wars*, 82 FOR. POL'Y 17 (1991).

¹³⁴ See *Integrated River Basin Development*, *supra* note 95. For earlier expressions of support for integrated management within the United Nations, dating back to 1949, see WATER LAW, *supra* note 36, at 427-28.

¹³⁵ *Organization for Planning, Construction and Operation of River Valley Projects*, Economic Commission for Asia and the Far East, U.N. Doc. St./ECAFE/Ser.F/19, at 61 (1962).

¹³⁶ *Report of the United Nations Water Conference, Mar del Plata, Argentina*, General Assembly, U.N. Doc. E/CONF.70/29 (1977), at 53.

pressly endorsed in the *Draft Articles on Non-Navigational Uses of International Watercourses* prepared by the International Law Commission and presented to the General Assembly in 1991.¹³⁷

Occasional arbitrations and mediations have also supported the communal approach. One of the best expressions was in a report of the Rao Commission appointed to resolve the dispute between Sind and Punjab before the partition of India. The report stated:

The most satisfactory settlement of disputes of this kind is by agreement, the parties adopting the same technical solution of each problem, as if they were a single unified community undivided by political or administrative frontiers If there is no . . . agreement, the rights of the several Provinces and States must be determined by applying the rule of "equitable apportionment," each unit getting a fair share of the water of the common river.¹³⁸

As the Rao Commission suggested, the problem with relying on the community of property concept, that is, a right to equitable participation in the transnational management of a common resource, is that international law does not provide a ready-made blueprint for the necessary institutional structures.¹³⁹ The customary legal obligation can only be expressed as an obligation to negotiate in good faith for the creation of the necessary institutions. This obligation is expressed in some detail in the International Law Commission's *Draft Articles*,¹⁴⁰ but it remains an imperfect obligation as there is no procedure to compel the parties to succeed in the negotiations. The Rao Commission indicated that absent such success, the best that can be done is to "partition" the water.

Full development of the community of property approach remains rare because nations are seldom willing to compromise their sovereignty over a basic resource to the extent necessary to optimize integrated water management within a basin. Nations have found it easiest to create institutions for gathering and sharing data, and it is not much more

¹³⁷ *Draft Articles*, *supra* note 12, at arts. 8, 26; *see supra* text accompanying note 67. *See also Draft Articles*, *supra* note 12, at arts. 20-24 (discussing states' obligations to protect and preserve the ecosystems of international watercourses through collective and separate action). *See generally* Ved P. Nanda, *The Law of Non-Navigational Uses of International Watercourses: Draft Articles on Protection and Preservation of Ecosystems, Harmful Conditions and Emergency Situations, and Protection of Water Installations*, 3 COLO. J. INT'L ENVTL. L. & POL'Y 175 (1992).

¹³⁸ Indus River Basin Case (Sind v. Punjab), Report of the Indus (Rao) Commission 10-11 (1942).

¹³⁹ Recognition of this problem pre-dates the Rao Commission. *See* BERBER, *supra* note 31, at 256-74.

¹⁴⁰ *Draft Articles*, *supra* note 12, at arts. 9, 11-18, 21, 23, 26-28.

difficult to create institutions empowered to forbid or restrain alteration of a watercourse. The latter is particularly true when the purpose of the institution (e.g., promoting navigation) is best served by preserving the watercourse more or less intact. Nations have, however, found it very difficult to agree to relinquish their sovereignty to international institutions authorized to plan, construct, or operate single or multi-purpose projects despite the considerable benefits to be expected from such institutions.

The goal of communal management unfortunately therefore remains largely unrealized. International organizations, such as the United Nations and the International Bank for Reconstruction and Development (the World Bank), bear considerable responsibility for this failure. Despite their consistent abstract support for communal management, they have done little to promote integrated management by communities of states sharing a particular basin. The World Bank rightly claims considerable credit for the Indus Waters Treaty,¹⁴¹ yet it has since taken a hands-off approach to integrated water management by declining to fund water projects until every state riparian to the watercourse has approved the project. This policy plays directly into the hands of the more highly developed lower-basin states,¹⁴² requiring the absolute integrity of the waterbody, and denying every riparian state, except the lowest, the right to develop water resources within their borders.¹⁴³ Yet, for international organizations to ignore the lower-basin interests, in a rush to develop water resources in upper-basin states, would also not be equitable or satisfactory. International organizations must begin to provide material incentives to communal management arrangements instead of sacrificing the interests of some riparian states to the interests of other riparian states.

VI. CONCLUSION

Ideal management of water requires a formal legal order in place of the present informal or customary legal order. To be effective in managing water and precluding conflict, the institutional structure and formal legal order would not only have to embody concepts of cooperative management, but it would have to be able:

¹⁴¹ The World Bank was instrumental in negotiating the Indus Waters Treaty and in arranging and managing an international fund that discharges India's apparent obligation under the Treaty to fund new dams and other works for the benefit of Pakistan. See *supra* note 93.

¹⁴² See *supra* note 128 and accompanying text.

¹⁴³ *Water in the Middle East*, *supra* note 3, at 165; *Surface Water*, *supra* note 24, at 815, 820; Lester, *supra* note 39, at 836-38.

- (1) determine the facts of water use in each nation;
- (2) resolve disputes across international boundaries;
- (3) guide responses to unusual temporary water shortfalls;
- (4) regulate or to design and implement long-term answers to the serious permanent shortages that exist in the region; and
- (5) enforce its decisions.¹⁴⁴

International practice does provide numerous examples to use as models for institutional design despite the rarity of full realization of the community of property arrangement.¹⁴⁵ Perhaps the earliest example was a joint commission established to determine the optimum sites for building locks to enhance navigation on the Meuse, which was created by the Treaty of Fontainebleau and located between the Holy Roman Empire and the Netherlands.¹⁴⁶ In the nineteenth and twentieth centuries, more elaborate arrangements were created, often creating a permanent commission to inspect or restrain activities that could impair navigability.¹⁴⁷ Similar single-purpose commissions, temporary or permanent, began to be created early in the twentieth century in an effort to coordinate the development of the hydroelectric potential of internationally shared waters, although many of these did not have final decision-making authority.¹⁴⁸

¹⁴⁴ See, e.g., U.N. DEP'T OF ECONOMIC AND SOCIAL AFFAIRS, NATURAL RESOURCES WATER SERIES NO. 1, MANAGEMENT OF INT'L WATER RESOURCES: INSTITUTIONAL AND LEGAL ASPECTS, REPORT OF THE PANEL OF EXPERTS ON THE LEGAL AND INSTITUTIONAL ASPECTS OF INTERNATIONAL WATER RESOURCES DEVELOPMENT, U.N. Doc. St/ESA/5, U.N. Sales No. E.75.II.A.2 (1975); Dellapenna, *supra* note 3, at 40-45; David Le Marquand, *Politics of International River Basin Cooperation and Management*, in WATER IN A DEVELOPING WORLD 147 (Albert E. Utton & Ludwik A. Teclaff eds., 1978); Rodgers & Utton, *supra* note 11; Albert E. Utton, *International Groundwater Management: the Case of the U.S.-Mexican Frontier*, in INTERNATIONAL GROUNDWATER LAW 157-88 (Ludwik A. Teclaff & Albert E. Utton eds., 1981).

¹⁴⁵ See, e.g., WATER LAW *supra* note 36, at 443-48; Evensen, *supra* note 56.

¹⁴⁶ *Traité d'Accord Definitif entre S.M. Imperiale et Royale Apostolique et L.H.P. Les Seigneurs États Generaux des Provinces Unies*, Nov. 8, 1785, Holy Roman Empire-Neth., art. 6, 4 MARTENS NOUVEAU RECUEIL (2e ed.) 56.

¹⁴⁷ See, e.g., Congress of Vienna, Final Act, June 9, 1815, arts. 108, 109, 2 MARTENS NOUVEAU RECUEIL (2e ed.) 427; *Traité de limites entre leur majestes le roi de Prusse et le roi des Pays Bas*, Oct. 7, 1816, art. 29, 3 MARTENS NOUVEAU RECUEIL (2e ed.) 54; Peace Treaty Between the Allied and Associated Powers and Germany, June 28, 1919, art. 331, 13 U.S. FOR. REL. 655-56; Convention on Navigable Waterways, *supra* note 79; Convention Instituting the Definitive Statute of the Danube, arts. 3-38, July 23, 1921, 26 L.N.T.S. 175; Convention Instituting the Statute of Navigation of the Elbe, art. II, Feb. 22, 1922, 26 L.N.T.S. 221; Convention Regarding Navigation of the Danube, *opened for signature* Aug. 18, 1948, art. 5-19, 33 U.N.T.S. 197, 199-205.

¹⁴⁸ See, e.g., Boundary Waters Agreement, *supra* note 75; Aus.-Czech. Frontier Treaty, *supra* note 75, at art. 30-31; Lake Convention, *supra* note 77; Doubs Convention, *supra* note 89;

There are only a few actual examples of multipurpose commissions with effective power. More commonly, as on the Nile or the Indus, the commissions are given authority only to gather and disseminate information.¹⁴⁹ One of the chief examples of an international commission endowed with real decision-making authority is the International Boundary Waters Commission created by the United States and Canada.¹⁵⁰ The Commission has the power to issue binding orders regulating the diversion or obstruction that affect boundary waters.¹⁵¹ However, even with this power, the two nations have felt compelled to undertake considerable and further negotiations to resolve many contentious issues.¹⁵² In fact, as Ludwik Teclaff has concluded, the Commission has shown little evidence of "a basin approach in issuing permits for construction in boundary waters."¹⁵³ On the other hand, the International Joint Commission established between the United States and Mexico was given operative rather than regulatory responsibilities, and is charged with planning, constructing, and operating dams and other works on the international reaches of the boundary waters.¹⁵⁴

In many parts of the world, water has been a central political factor since ancient times.¹⁵⁵ Water continues to be central today. Whether such a structure as I have outlined can be negotiated over such a vital resource, particularly between actors with deeply entrenched distrust and hostility, might seem unlikely, yet the alternatives seem less tolerable. The very importance of water makes cooperation over water more likely than conflict.¹⁵⁶ As in ancient times, the shared need for optimum management of scarce water can become a source of regional unity rather than of regional discord.¹⁵⁷ Water can thus become the key to building peace within a region, if the interested states are prepared to exploit this possibility actively and effectively, rather than to allow themselves to drift into mutually destructive competition.

Rhone Convention, *supra* note 89; Convention on Hydraulic Power, *supra* note 80; Swedish-Norwegian Convention, *supra* note 77; Duoro Convention, *supra* note 83.

¹⁴⁹ Nile Treaty, *supra* note 115, at art. 4; Indus Waters Treaty, *supra* note 91, at arts. VIII, IX.

¹⁵⁰ Boundary Waters Treaty, *supra* note 75.

¹⁵¹ *Id.* at arts. III, IV.

¹⁵² See, e.g., Columbia Basin Treaty, *supra* note 78. See generally WATER LAW, *supra* note 36, at 428-29, 438-43, 458-61; Utton, *supra* note 9, at 65.

¹⁵³ WATER LAW, *supra* note 36, at 447.

¹⁵⁴ Water Utilization Treaty, *supra* note 90, at art. 2.

¹⁵⁵ See HISTORY AND LAW, *supra* note 15, at 28-32, 42-74.

¹⁵⁶ See *supra* notes 1-19 and accompanying text.

¹⁵⁷ See, e.g., KARL WITTFOGEL, ORIENTAL DESPOTISM: A COMPARATIVE STUDY OF TOTAL POWER (1957).