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Integrated Water Law: Local to International

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On this date, the undersigned members of the Dissertation Examination Committee of Margaret J. Vick, on the basis of the defense by Ms. Vick of her dissertation, "Integrated Water Law: Local to International," recommend that the University of the Pacific, McGeorge School of Law, confer on Ms. Vick the degree of Doctor of Juridical Science (J.S.D.) in International Water Resources Law.

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The Senegal River Basin: A Retrospective and Prospective Look at the Legal Regime, 46 NATURAL RESOURCES JOURNAL 211 (2006)

Preface

My experience with water "law" for irrigated agriculture first occurred at the age of 5 when I moved with my family to a home on small acreage in the Elephant Butte Irrigation District on the Rio Grande. There I played in the irrigation water, visited with the ditch rider and picked wild asparagus from the ditch banks. I developed a childhood understanding that the water necessary to grow the cantaloupes, cotton, onions and sorghum in the fields around my home came not from the clouds but from the ditches delivering water to each field in turn throughout the valley. It was a place where I could smell the water approaching through the ditches the same way you can smell the rain approaching in the desert. My great grandparents and grandparents tried to farm on their homesteads in central New Mexico using water from the clouds, dry-land bean farming, and they soon switched to cattle grazing.

Many years later I arrived in a law school class on water law taught by Frank J. Trelease the preeminent water lawyer of the 20th Century. The study of water law with Prof. Trelease confirmed my views about the ownership of water. It must be beneficially used and every irrigator knows water cannot be wasted—it is not only illegal, but immoral in that waste on one field means the field at the end of the ditch will remain dry. The right to the water is owned. It is measurable and it is defensible against others who interfere with that right. In the southwest if there is a shortage of water the most junior users go without, first in time is first in right. This is the way it is!

During my career I have been very fortunate to have opportunities to represent tribal governments in the determination of their water "rights." The Tribes of the southwest have water "claims" which may only be converted to "rights" by a court decree or legislation. Most

"claims" were ignored for more than 100 years but in recent decades these claims have converted to rights through general stream adjudications and water rights settlements.

It is with this background that I entered the classroom of Stephen C. McCaffrey in International Water Law in the 2004 spring semester and began the intellectual quest to understand the principles of equitable and reasonable utilization and equitable and reasonable participation; a form of water law not based on priority or volumetric measures. This dissertation is an attempt to discuss the legal difference between these systems of water allocation—the local use based on rights to water and the international and transboundary allocations based on equality of right and is a reflection of my learning about the process of water allocations. Throughout this 200 page discussion of water law, local to international, the principle character remains the irrigator at the end of the ditch.

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Introduction

"In a group of mountains a small river has its source. A dozen or a score of creeks unite to form the trunk. The creeks higher up divide into brooks. All these streams combined form the drainage system of a hydrographic basin, a unit of country well defined in nature, for it is bounded above and on each side by heights of land that rise as crests to part the waters. Thus hydraulic basin is segregated from hydraulic basin by nature herself, and the landmarks are practically perpetual. In such a basin of the arid region the irrigable lands lie below; not chiefly by the river's side, but on the mesas and low plains that stretch back on each side. Above these lands the pasturage hills and mountains stand, and there the forests and sources of water supply are found. Such a district of country is a commonwealth by itself. The people who live therein are interdependent in all their industries. Every man is interested in the conservation and management of the water supply, for all the waters are needed within the district. The men who control the farming below must also control the upper region where the waters are gathered from the heaven and stored in the reservoirs. Every farm and garden in the valley below is dependent upon each fountain above.

All of the lands that lie within the basin above the farming districts are the catchment areas for all the waters poured upon the fields below. The waters that control these works all constitute one system, are dependent one upon another, and are independent of all other systems. Not a spring or a creek can be touched without affecting the interests of every man who cultivates the soil in the region. All the waters are common property until they reach the main canal, where they are to be distributed among the people. How these waters are to be caught and the common source of wealth utilized by the individual settlers interested therein is a problem for the men of the district to solve, and for them alone.

But these same people are interested in the forests that crown the heights of the hydrographic basin. If they permit the forests to be destroyed, the source of their water supply is injured and the timber values are wiped out….

Then the pasturage is to be protected. The men who protect these lands for the water they supply to agriculture can best protect the grasses for the summer pasturage of the cattle and horses and sheep that are to be fed on their farms during the months of winter….

Thus it is that there is a body of interdependent and unified interests and values, all collected in one hydrographic basin, and all segregated by well-defined boundary lines from the rest of the world. The people in such a district have common interests, common rights, and common duties, and must necessarily work together for common purposes."[1]

John Wesley Powell painted this vision of utopian water management for the western United States in the late nineteenth century. It did not come to pass. Political borders were drawn to create states in the vast western territory of the United States, as in all the rest of the world,

[1] John Wesley Powell, *Institutions for the Arid Lands, originally appearing in* Century Magazine 40:111-16, May

without regard to the boundaries established by "nature herself." Farms in low lands develop water delivery infrastructure and the systems, rules and laws for distribution and sharing. The pasturage is protected by those who run livestock and the forests by the timber interests. The challenge is that each of these regions may be within a different local jurisdiction which has its own priorities for water management that do not and cannot control those within another jurisdiction.

We live in an age of globalization and interconnectedness, however, too many of us live as though the small segment of the hydraulic basin in which we are located is disconnected from our downstream neighbors or that our use of a transboundary watercourse does not have consequences within the basin. We do not recognize the natural system that Powell described more than 100 years ago as the same system that provides our water. The natural system operates without regard to political boundaries but it is greatly impacted by those boundaries.

The legal systems for allocating and sharing water within and across political boundaries are explored herein. Each hydraulic basin is unique in its natural systems and development history such that agreements, allocations, and management do not easily transfer from one basin to another. However, frameworks for analyzing systems and lessons learned from one hydraulic basins are crucial to effective management in another. Within all basins water laws are used to resolve conflicts among users and provide security for continued water use.

The nature of water law is explored in its many variations beginning with local water laws such as prior appropriation which is based on property law, riparian rights protected in tort, water agreements treated as contracts and equitable apportionment. Each discipline of law; property, tort, contract and equity, operate on the same resource at the same time. Water laws may be as complex and varied as the resource to which they are applied.

The following quote from the Restatement First, Torts, captures some of these complexities.

> "Water, like air and light, is a fugitive, wandering thing, flowing over and through land, but seldom remaining for any length of time in one place or within the confines of any one person's possession. One's dominion over it while it is upon his land is temporary, and since it ordinarily flows onto the lands of other persons, it is a thing common to the lands of all through whose possession it passes. Unlike air, it is limited in quantity, and a substantial use of it by one may prevent others from having it. This does not mean that individual rights or privileges in respect to it are different in principle from what they are in respect to other physical things. It simply means that there is more likely to be a conflict of interest over the use of waters than over the use of other things, and that the rights and privileges of individual users are subject to greater limitation out of regard for the common interests of all."[2]

In addition to the various water laws, another broad theme discussed herein is the confluence of two legal systems governing utilization of a single water source. Local laws for allocation of water among individuals and sectors of society develop at the local level and reflect the natural conditions, the culture of the population and the most common utilization of the water. Local laws develop from the bottom and work their way up into state, provincial or regional laws. The principles of international and transboundary water law have developed at the highest levels of government and impact water allocation and utilization from the top down. The principles of international water law are set forth in watercourse agreements negotiated state to state and those which have crystallized as customary international law binding on all states. Transboundary water law developed in the United States in the jurisprudence of the Supreme Court when called upon to resolve disputes among the states of the United States.

The first part of this paper examines local laws for the allocation of water noting that these develop to accommodate the natural hydraulic system and the needs of the people. At the local level, law often creates "rights" to the use of water and this concept is explored. Transboundary (interstate and international) water laws often do not create "rights" to water, but establish equitable principles for sharing a fluctuating natural resource. These equitable principles are

[2] RESTATEMENT (FIRST) OF Torts, §850 Scope Note (1939).

deconstructed and distinguished from the "rights" which may be held at the local level. Theories of legal pluralism are used to explain the relationship between the local and transboundary laws governing the same resource.

Part II explores building a bridge between a rights based system at the local level and the equitable principles for sharing water that guide utilization of a transboundary river. That bridge is a negotiated agreement among the basin states. This part discusses the role of law in watercourse negotiations. Law may establish the boundaries within which negotiations take place and level the playing field among states within a basin with asymmetric power distribution. Also discussed is a methodology to incorporate local water rights into an equitable transboundary system using the *Winters* reserved rights doctrine of the United States.

Part III is an examination of selected transboundary agreements examining different water sharing arrangements and the institutions created to implement the arrangements. Flexibility within basin institutions is essential to respond to changing natural conditions and human uses.

For this exploration of water law, we start with the application of a classic discussion of law, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral,* by Guido Calabresi and A. Douglas Melamed.[3]

[3] Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral,* 85 HARV. L. R. 1089 at 1090 (1972).

Part I
Water Allocation: Local and International

Part I

Water Allocation: Local and International

What is water law? What is international water law or as is described, the law of international watercourses? Part I examines the first question from the bottom-up, looking at local water law development that may, or may not be codified by a governmental entity. The latter question is examined from a top-down perspective, the development of legal principles through customary practice and agreement of nations as codified in an international convention negotiated at the highest level of global governance.[4]

Calabresi and Melamed in their seminal article, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral,*[5] assert that society establishes entitlements through the legal systems it adopts.[6] The rules of property, liability and inalienability within that legal system protect the entitlements by favoring one party over another in a conflict.[7]

> The first issue which must be faced by any legal system is one we call the problem of "entitlement." Whenever a state is presented with the conflicting interests of two or more people, or two or more groups of people, it must decide which side to favor.[8]

This statement is the foundation of a legal system. However, the law governing a single watercourse exists at multiple levels, top to bottom, within multiple societies. The Colorado River in the western United States is a highly developed transboundary watercourse and the

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[4] United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses, UN Doc. A/Res/51/869, May 21, 1997 [hereinafter 1997 UN Convention].
[5] Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral,* 85 HARV. L. R. 108 (1972).
[6] *Id.* at 1090.
[7] Other scholars writing about entitlements maintain that the classifications of property, liability and inalienability are types of entitlements, not rules for their protection. *See* Madeline Morris, *The Structure of Entitlements,* 78 CORNELL L. REV. 822 (1992-1993).
[8] Calabresi & Melamed, *supra* note 2 at 1090.

subject of multiple transboundary agreements,[9] the oldest nearly a century old,[10] as well as scores of judicial opinions.[11] Within the United States the Constitution and the cases interpreting it create a hierarchy of laws from international to local. Making a simplistic example of the Colorado River, the River is first divided to meet the Treaty obligations between the United States and Mexico.[12] Next, the portion of the river available for use in the United States is divided into an upper and lower basin according to the terms of an interstate compact approved by Congress.[13] The upper division states apportion their share of the river by Compact[14] and the lower division states apportion their share of the river according to the terms of an Act of Congress.[15] Each state within each basin has its own "water law" that governs the rights and privileges of users within that state. If the water within the Colorado basin is not sufficient to supply all legal uses the individual users may have their rights limited by state, states are limited by the Compact establishing the lower or upper division apportionments, and the upper and lower basin apportionments are limited by international treaty obligations. Each level may use only that portion available after division among the "higher" levels of apportionment.

I use the term "vertical legal pluralism" to describe this transboundary legal structure. Vertical legal pluralism affects all transboundary watercourses. Chapter I examines elements of

[9] The term "transboundary agreements" is used to include treaties among states and compacts among states of the United States.
[10] La Plata River Compact November 27, 1922, 43 Stat. 796 (1925).
[11] *See* Arizona v. California, 283 U.S. 423 (1931), Arizona v. California, 298 U.S. 558 (1936), Arizona v. California, 344 U.S. 919 (1953), Arizona v. California, 373 U.S. 546 (1963), Arizona v. California, 376 U.S. 340 (1964), Arizona v. California, 547 U.S. 150 (2006) among others that have been decided by the United States Supreme Court.
[12] Treaty between the United States and Mexico relating to the Utilization of the Waters of the Colorado and Tijuana Rivers, and the Rio Grande (Rio Bravo) from Fort Quitman, Texas to the Gulf of Mexico, Feb. 3, 1944 and supplementary Protocol Nov. 14, 1944, 3 U.N.T.S. 314.
[13] Colorado River Compact, signed November 24, 1922, Ariz, Cal., Colo. Nev., N.M., Ut., Wyo. The 1922 Compact was approved by Congress through the Boulder Canyon Project Act of 1928, 45 Stat. 1057 (1928) which provided that the 1922 Compact would enter into force upon the approval of 6 of the 7 basin states and by proclamation of the President. This occurred with the proclamation of President Hoover on June 25, 1929.
[14] Upper Colorado River Basin Compact, 1948, Ariz., Colo., N.M., Ut., Wyo., 63 Stat. 31 (1949)
[15] Boulder Canyon Project Act, 45 Stat. 1057 (1928) codified at 43 U.S.C. §617 (2000).

this vertical structure beginning with selected examples of local laws and an examination of the various legal principles upon which water laws are based.

Chapter Two examines the law governing international watercourses[16] as a top-down legal system. This chapter provides an in-depth examination of the international legal principles of equitable utilization and reasonable use.

Chapter Three explores the tension between rights-based local water laws and principles of equitable and reasonable utilization upon which international law is based and asks if the law of international watercourses has faced what Calabresi and Melamed describe as the first issue of any legal system, the problem of entitlement.[17] In other words, the question posed is whether the term "water rights" means the same thing up and down the vertical spectrum of legal pluralism.

In Chapter Four the dispute over the Vermejo River,[18] a small transboundary stream in the states of New Mexico and Colorado, is examined as an example of the relationship between the law of transboundary equitable apportionment and the local laws of prior appropriation and reasonable use.

[16] The definition of "international watercourse" is that from the 1997 UN Convention *supra* note 1 "A watercourse, parts of which are situated in different States." (Art. 2(b)) A watercourse is defined as "a system of surface waters and groundwaters constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus." (Art. 2(a)).
[17] Calabresi & Melamed *supra* note 2 at 1090.
[18] Colorado v. New Mexico, 459 U.S. (1982) and Colorado v. New Mexico, 467 U.S. 310 (1984).

Chapter 1: Local Water Law

Irrigation societies around the world have developed water governance systems to meet their local needs.[19] The systems of governance are similar in that each includes a mechanism to determine who may use the water and for what purposes and each has a mechanism to make adjustments when either the watercourse or the uses change.[20] Many of the local systems base the right to use water in property law. Some even permit the selling of a water right separate and severed from the land on which the water was originally used. A survey of local water governance systems from around the world reveals that "cultivators from the valleys of northern Laos to the tributary creeks of the upper Rio Grande in New Mexico physically constructed the apparatus for water diversion and socially constructed locally recognized and locally defensible access to the appropriated water."[21]

The examples in this chapter illustrate that the normative rules for use of a common resource develop within the community that shares the resource. Institutions legitimize and enforce the rules, however, the water law for allocation of the resource to users remains inherently local developing from the bottom up.

William Eskridge[22] provides three assumptions regarding law from the bottom-up:

- Law comes from the bottom up. Official law is influenced, often decisively, by what goes on in communities subject to their commands. What officials say is law neither exhausts the subject nor ends debate.

[19] NEGOTIATING WATER RIGHTS (Bryan Randolph Bruns & Ruth S. Meinzen-Dick eds., International Food Policy Research Institute, 2000).
[20] H.L. Joep Spiertz, *Water Rights and Legal Pluralism: Some Basics of a Legal Anthropological Approach* in NEGOTIATING WATER RIGHTS *supra* note 16, 162, 165-175 (2000).
[21] E. Walter Coward, Jr., *Preface,* NEGOTIATING WATER RIGHTS *supra* note 16, 17 (2000).
[22] William N. Eskridge, Jr. in his article *Public Law from the Bottom Up* (97 W. VA. L. REV. 141 (1994)) makes the argument that changes to public law develop through a struggle of "nomic" communities within society and develop from the bottom-up.

- Choice of law is not neutral. It is deeply ideological, generational, and subject to shift in response to changed circumstances.
- Our obligation to obey the law is based upon its normativity and not just its official pedigree. Every time the polity tries to suppress a vision of law, it risks its legitimacy, because it risks alienating groups whose vision has been suppressed.

Eskridge emphasizes that while law may "effervesce" up from the bottom, state institutions interdependent of each other, influence the development of law through the local community anticipation of their responses and the potential veto or displacement of the emerging changes in law.[23]

Lundqvist states the "need for clarification of rights and obligations" in water management and maintains that effective water management occurs at the user level.[24] When state institutions become separated from the user, water management is not cohesive and national water laws and national control of resources may either be ignored or de-legitimized creating a situation in which water law is not accepted by the water user.[25] Within a system of vertical legal pluralism the legitimacy of each level of water law depends on the legitimacy of each subsidiary level.

The water laws of prior appropriation, *acequias,* riparian rights, Moroccan springs and *subaks,* are discussed below as examples of local water laws that "evolve from the bottom-up as individuals competing for resource uses assert their claims to be free of other competing uses."[26] The local water laws discussed herein are those dealing with the creation of rights and entitlements to the use of a watercourse. These rights may be private or communal, but all

[23] *Id.* at 163-164.
[24] Jan Lundqvist, *Rules and Roles in Water Policy and Management, Need for Clarification of Rights and Obligations,* 25 IWRA, WATER INTERNATIONAL 194, 196 (2000).
[25] *Id*.
[26] Terry L. Anderson & J. Bishop Grewell, *Property Rights Solutions for the Global Commons: Bottom-Up or Top-Down,* 10 DUKE ENVTL. L. & POL'Y F. 73, 77 (1999).

include methods for allocation and the protection and enforcement of those uses considered legitimate.[27]

H. L. Joep Spiertz analyzes the conflict among competing laws regulating the utilization of a water resource in his work on legal pluralism.[28]

> Legal anthropology teaches researchers in the field of natural resource management, property regimes, and water rights, not to start from the normative oratory of the legal profession, nor from the recitals of local traditional law. Instead, the place to begin lies in people's daily experience regarding their normative environment, with all its ambiguity, variation and contradiction. It explicitly draws attention to what can be called "the how, and the when and where" of the significance of law in social practice.[29]

Spiertz urges a study of water law by examining the practices of users which includes the local law developed from the bottom-up. The sovereign control of water resources, a top-down approach, may incorporate local law, as is discussed in the context of prior appropriation below, or it may be in conflict with local law in which case it risks losing local legitimacy.

Jan Lundqvist urges the same approach. Water users are the ultimate stakeholders in any government, regulatory or management plan. It is the human dimension, the societal rules and understandings of water use that management must consider in addition to the engineering of water availability.[30]

> "It is, of course, important to have an overriding policy and regulatory arrangements through which the multiple and vital functions of water in society and in ecosystems can be handled. From this perspective, governments have a critical role to play. However, due to historical circumstances, in particular the colonial impassible rule and its aftermath, the governments in many countries in the south have developed water and environmental policies that have tended to separate people from management tasks previously part of a social, cultural, and community based system and instead have spearheaded grand engineering solutions."[31]

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[27] *Id.* at 79-83. Local bottom-up development of these rights conserves on resources and enforcement costs as homogenous societies develop cultural norms for right and wrong behavior in relation to the resource. *Id.*
[28] Spiertz *supra* note 17.
[29] Spiertz *supra* note 17 at 184.
[30] *Id.*
[31] Spiertz *supra* note 17. at 195.

The 2003 United Nations World Water Development Report identified the importance of rights to water for effective governance.[32] In the chapter on Governing Water Wisely for Sustainable Development the report notes that "In many developing countries, local regulations, customary laws and traditional rights assign rights and responsibilities that differ from state regulations. It is therefore important for formal rights to consider traditional practices."[33]

Referencing the work by Lundqvist the report emphasizes the importance of "water rights" that are clearly defined in order to have effective water governance. Water rights and obligations "stipulate who is entitled to what quantity and quality of water, and when they are entitled to it."[34] They are most often based in property law.

The Report identifies and defines four types of property rights in water:

- "Open access property: There is no defined group of users or owners and the water resource is open to anyone.
- Common property: The group in charge of the resource, such as a local community or a particular user group, has a right to exclude non-members from uses and benefits. Members of the management group have both rights and obligations with respect to use and maintenance of the water resource.
- State property: Water users and citizens in general have an obligation to observe use and access rules determined by the controlling government agencies.
- Private property: Within the existing institutional framework the owner has the right to decide on water access and uses. Those without rights or financial means to acquire water are excluded from consumption."[35]

The following discussion of selected local water laws begins with the prior appropriation doctrine of the western United States and the *acequias* which are located primarily in northern

[32] WATER FOR PEOPLE, WATER FOR LIFE, THE UNITED NATIONS WORLD WATER DEVELOPMENT REPORT, Ch. 15 (2003).
[33] *Id.* at 374.
[34] *Id.*
[35] *Id* at Box 15.3 at 375.

New Mexico a state which follows the doctrine of prior appropriation. The other examples include riparian rights as developed in the eastern United States, allocation of spring flows in Morocco, and the *subak* system in Bali which is similar to the historic system for water allocation in Sri Lanka.[36]

Prior Appropriation

In the arid regions of the western United States a system of water law developed which gives a priority of use to the first person or entity to utilize the watercourse.[37] This priority is good against all later users regardless of their location on the watercourse so long as the use is beneficial. The meaning of "beneficial use" and the determination of which uses are beneficial develops within each legal system as conflicts arise over water allocations. Most prior appropriation systems define "beneficial use" as including mining, agricultural, domestic and municipal uses.[38] However, as societal preferences change, in-stream flows for ecological protection and recreation have been added as legally protected beneficial uses.[39]

Once the water is applied to beneficial use a priority date is established. If demand exceeds supply, as often occurs in the arid regions of the western United States, the first in time to utilize the water has the first right to its continued use and the later priority rights holders do not receive water.[40] Water may be diverted and conveyed hundreds of miles from the watercourse.[41]

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[36] Water allocation within Sri Lanka is described by the International Court of Justice Vice President Weeramantry in his separate opinion in the Case concerning the Gabcíkovo-Nagymaros Project. *Case concerning the Gabcíkovo-Nagymaros Project* (Hungary/Slovakia), Judgment of Sept. 25, 1997, 1997 ICJ 7; repr. in 37 ILM 162 (1998), also available on the ICJ web site, www.icj-cij.org.

[37] *See*, Irwin v. Phillips, 5 Cal. 140 (1855) and Clough v. Wing, 17 P. 453 (Ariz. 1888)

[38] *See* DAVID H. GETCHES, WATER LAW IN A NUTSHELL 97 (1997) (1984).

[39] *See* JOSEPH L. SAX, ET AL, LEGAL CONTROL OF WATER RESOURCES 141-143 (4TH ed 2006).

[40] SAX, ET AL *supra* note 36 at Ch. 3, GETCHES, *supra* note 35 Ch. 3.

[41] *See,* A. Dan Tarlock, *The Future of Prior Appropriation in the New West,* 41 NAT. RESOURCES J. 769 (2001).

Using the definitional matrix from the World Water Development Report set forth above the owner of a prior appropriation right has a private property right. [42] Each user who complies with the prescribed common law and statutory requirements[43] obtains a usufruct right which may be enforced against junior appropriators through the judicial system. The doctrine of prior appropriation is summarized by the phrase "first in time, first in right." The first person to divert water from a watercourse and put that water to beneficial use, as that term is described under local law, has the superior legal right to the continued use of water subject to laws for abandonment and forfeiture of the right. When a watercourse becomes fully appropriated, the rights equal or exceed the supply, "those without rights…are excluded from consumption"[44] unless a market or transfer mechanism is established.

The prior appropriation doctrine is traced to gold miners in California in the mid-nineteenth century.[45] Public lands were open for mineral exploration with property rights granted from the United States to the first person to stake a claim to the minerals. The right to water, which was essential to the mining operations, developed along with the rights to the land. The first reported judicial opinion addressing prior appropriation, *Irwin v. Phillips*,[46] notes the inapplicability of riparian law in a region in which much of the riparian land is owned by the government.[47] With the statement that "[c]ourts are bound to take notice of the political and social condition of the country which they judicially rule,"[48] the court upheld the local practice to

[42] *Supra* note 32. *See also* GETCHES *supra* note 35 at 82-85 for a discussion of prior appropriation and private property.
[43] GETCHES *supra* note 35 at 74-75. Many states have added a requirement to register or obtain a permit.
[44] *Supra* note 32.
[45] *See* John D. McGowen, *The Development of Political Institutions on the Public Domain,* 11 WYO. L. J. 1, 8-14 *reproduced in* FRANK J. TRELEASE, WATER LAW 20-22 (3rd ed. 1979).
[46] 5 Cal. 140 (1855).
[47] *Id* at 145.
[48] *Id* at 146.

respect the use of water by the person who first diverted it, and the doctrine of "prior appropriation" was recognized.

The rapid development of the arid western states was facilitated by the prior appropriation doctrine. The doctrine was developed to meet the needs of an expanding and growing economy based on agriculture and mining. However, it encouraged a "race to the river" and an over-appropriation of water. It supported the western philosophy that a drop of water reaching the ocean is a drop of water wasted.[49]

In summary, the United States Supreme Court described the doctrine of prior appropriation as follows:

> The common-law rule respecting riparian rights in flowing water never obtained in either state [Wyoming and Colorado]. It always was deemed inapplicable to their situation and climatic conditions. The earliest settlers gave effect to a different rule whereby the waters of the streams were regarded as open to appropriation for irrigation, mining, and other beneficial purposes. The diversion from the stream and the application of the water to a beneficial purpose constituted an appropriation, and the appropriator was treated as acquiring a continuing right to divert and use the water to the extent of his appropriation, but not beyond what was reasonably required and actually used. This was deemed a property right and dealt with and respected accordingly. As between different appropriations from the same stream, the one first in time was deemed superior in right, and a completed appropriation was regarded as effective from the time the purpose to make it was definitely formed and actual work thereon was begun, provided the work was carried to completion with reasonable diligence. This doctrine of appropriation, prompted by necessity and formulated by custom, received early legislative recognition in both territories and was enforced in their courts. When the states [Wyoming and Colorado] were admitted into the Union it received further sanction in their Constitutions and statutes and their courts have been uniformly enforcing it.[50]

The doctrine of prior appropriation does not support conservation and gives little consideration to the ecology or "natural" resources associated with the watercourse including native fish and vegetation. Such uses do not fit the statutory requirements for diversion of water for defined beneficial uses resulting in an increasing list of endangered native fish in the western

[49] *See* A. Dan Tarlock, *International Water Law and the Protection of River System Ecosystem Integrity,* 10 BYU J. PUB. L. 181, 186-188(1996).
[50] Wyoming v. Colorado, 259 U.S. 419, 459 (1922).

United States. In many states the doctrine has not evolved to meet the needs of an urbanizing society. It is politically difficult to address these issues in part because of the private property nature of the water rights.[51] However, rarely are junior appropriators without water nor has a lack of water slowed growth and development as states build additional water storage, bring water through major works from other basins, modify restrictions on groundwater withdrawal and encourage market based water transfers.[52]

Acequias

"*Acequia"* is the Spanish word for ditch, in particular an irrigation ditch. But the use of this term in the northern part of the state of New Mexico means much more. *Acequias* include governance, community and culture all of which coalesce around the *acequia* that delivers the water.[53] The water is the common property of the *acequia* community.[54]

The state of New Mexico has an ancient history of indigenous Pueblo irrigation societies within the Rio Grande valley. The Spanish first settled near these Pueblos in 1598 and remained until driven out during the Pueblo Revolt of 1680. Upon reconquest in the late 17th century the Spanish settled in *ranchitos* developing an irrigation society around *acequias.* Under Spanish rule the early settlers developed "*acequias de común"* or "*de communidad"* (shared ditches) to develop the physical infrastructure necessary for a village to survive in the arid and often hostile region. Labor for construction and maintenance was divided proportionately based on benefit.[55]

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[51] *See generally* ARIZONA WATER POLICY, MANAGEMENT INNOVATIONS IN AN URBANIZING, ARID REGION, BONNIE G. COLBY & KATHERINE L. JACOBS EDS. (2007) for a discussion of the difficulties of managing a water system using laws which do not integrate the natural water cycle.
[52] A. Dan Tarlock, NATURAL RES. J. (2001).
[53] *See generally* JOSÉ A. RIVERA, ACEQUIA CULTURE, WATER, LAND & COMMUNITY IN THE SOUTHWEST (1998) and SYLVIA RODRÍGUEZ, ACEQUIA, WATER SHARING, SANCTITY, AND PLACE (2006).
[54] *See* WORLD WATER DEVELOPMENT REPORT *supra* note 29.
[55] RIVERA *supra* note 47 at 52-53.

Within many *acequia* communities today water remains a public good shared by all within the community. The diversion works, the physical *acequias,* are community assets the maintenance of which is performed by the community for the benefit of all. The community selects a commission and a *mayordomo*[56] who is the "ditch boss" and community leader. He divides the water and the maintenance responsibilities among the *parciantes*, a term used to describe both the land parcels and the owners. Each community has its own rules of governance and methods for sharing the resource.

Among the earliest written rules for water delivery are those for the Margarita Ditch in San Patricio, New Mexico. In 1903 the community documented the community rules, the "*Reglas y Reglamentes,"* setting forth the basic governance of the *acequia.* The *mayordomo* is instructed to deliver water for 1 ½ days to each *derecho de aqua* (water right) beginning with the farthest downstream and rotating to all members,[57] except that on Sundays the waters are reserved for irrigation of family gardens.[58] The *derecho de aqua* is described as a share with each share measured by diversion time. Large *parcientes* might have more than one share while individuals using water only for domestic purposes have less than one share.

The history and operations of the *acequias* in the Taos Valley in northern New Mexico are documented by Rodríquez.[59] The upper reaches of the Rio Pueblo de Taos is within the Taos Pueblo and used for irrigation and domestic purposes by the Native Americans within the Pueblo. The downstream *acequia* communities also rely on the Rio Pueblo for irrigation and domestic purposes. Conflicts between the Pueblo and *acequia* communities erupted in the late

[56] Rivera notes that historically the superintendent of the irrigation ditch settled on *mayordomo* sometime before 1852 when legislation called for annual elections by all local ditch irrigators of a *mayordomo.* RIVERA *supra* note 47at 55.
[57] *Id.* at 80-82.
[58] *Id.*
[59] RODRÍGUEZ *supra* note 47.

19th century. Rodríquez reports that after legal battles in Territorial Court, representatives of the Pueblo and the Town of Taos met at the courthouse and agreed upon a water sharing arrangement. In times of shortage the residents of the *acequia* community of Fernando de Taos are permitted to divert the water from twilight Friday until dawn on Monday. The irrigators taking from the *Acequia Madre* (the "mother ditch" or main irrigation canal) have its use all day Monday. The rest of the time the Pueblo may divert all the water.[60] Most years the *mayordomos,* charged with delivery of water to the *acequias,* and the Governor of Taos Pueblo, charged with delivery of water within the Pueblo, meet to discuss and confirm this arrangement and their shared responsibilities.[61] This major division of water between the Taos Pueblo and the downstream communities is still followed more than 100 years after the agreement was reached.[62]

Among the *parciantes* within the Taos valley the water is allocated using a time rotation similar to what is described above on the Margarita Ditch. However, when sufficient water is available for all, diversions are made upon request to the *mayordomo* who delivers it based upon who requested the water first. In times of shortage, all within the *acequia* share what is available.

The *El Rito de La Lama Acequia* in Taos County distributes water based on shares with each share measured in units of time. Each *parciante* may open its gate on the ditch for the assigned amount of time which is determined by the use to be made of the water. The 1998 litigation among the *parciantes* of *El Rito Acequia* highlights the concepts of shares in water and the customary governance of *acequias.*

[60] *Id*. at 36-39.
[61] *Id.* at 40-42.
[62] *Id*.

El Rito Acequia Association has water rights that were adjudicated in state court in 1963 and 1980. For purposes of this discussion, water rights are measured by shares with one share equal to a diversion of the full flow of the ditch for one hour once a week. The Association holds 168 shares. One *parciante* owned by the Wilsons has rights to 102.5 shares, the equivalent of 61% of the water. Disputes within the Association arose over the Wilsons' horses and their contamination of the water in the ditch which is used by "downstream" *parciantes* as their sole domestic supply. The Association voted to require the Wilsons to fence their horses away from the *acequia.* The Wilsons attempted to take control of the Association and challenged the election of commissioners and the *mayordomo.*

Each *acequia* member had one vote in the election of the commissioners and the *mayordomo*. The Wilsons argued that New Mexico law required voting to be in proportion to water use. The New Mexico Supreme Court upheld the traditional method of governance holding that no single method of voting was prescribed by New Mexico law.[63] Custom and the rules of the *acequia* control its governance noting that most *acequias* vote for the commissioners and *mayordomo* based on one vote per *parciante*. However, sharing the responsibility and cost for ditch maintenance varies among *acequias* with most basing assessments on water shares. .

Distribution of water according to *acequia* rules is recognized in the laws of the territory and later the state of New Mexico. The traditional practices were first codified in the Kearny Code for the New Mexico Territory in 1846[64] and incorporated in the Treaty of Guadalupe

[63] Wilson v. Denver, 961 P.2d 153 (N.M. 1998). The *acequia* commission voted to require the upstream *parciante* using 61% of the water to fence the *acequia* to prevent contamination from his horses and protect the water quality for downstream domestic use. The land owner sued in state court claiming the voting process was invalid claiming that New Mexico law required voting based on percentage of water use.

[64] ORGANIC LAW FOR THE TERRITORY OF NEW MEXICO COMPILED UNDER THE DIRECTIONS OF GENERAL KEARNY, *in* OCCUPATION OF MEXICAN TERRITORY, S. Doc. No. 896, 62d Cong., 2d Sess. 10175 (1912).

Hidalgo between the United States and Mexico in 1848.[65] The New Mexico territorial laws of 1851 and 1852 confirmed the *acequia* rules and incorporated them into territorial law.[66]

The *acequia* system is incorporated in New Mexico law by statute.[67]

The New Mexico Constitution adopted in1910 recognizes *acequia* water rights in Article XVI Section 1: "All existing rights to the use of any waters in this state for any useful or beneficial purpose are hereby recognized and confirmed." The New Mexico Constitution further provides that "The unappropriated water of every natural stream, perennial or torrential, within the state of New Mexico, is hereby declared to belong to the public and to be subject to appropriation for beneficial use, in accordance with the laws of the state. Priority of appropriation shall give the better right."[68] Thus, New Mexico law recognizes the *acequia* system within the state water law system of prior appropriation.

These two systems of allocation are not always compatible. The surface waters within the state are over-appropriated. Market transfers of water rights which are severed from the appurtenant land permits growth and development within the existing supply of water. Conflicts arise between *acequias* that do not permit or want water to be removed from the community and the state law permitting market transfers. The state legislature passed a law requiring the State Engineer to consider impacts to the community and water users within the community prior to

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[65] Treaty of Peace, Friendship, Limits, and Settlement between the United States of America and the United Mexican States, signed at Guadalupe Hidalgo, Feb. 2, 1848, 9 Stat.922.

[66] Sec. 8, Rev. Statutes and Laws of the Territory of New Mexico, Ar. I, ch. I, Act of the 20th July, 1851, "Que de las acequias ya establicidas no se embaraze su curso."[That the course of ditches (*acequias)* already established shall not be disturbed.]; Sec. 9, Act of 7th Jan. 1852, "Que todos los ríos y Corrientes de aqua en este Territorio, anteriormente conocidos como acequias públicas, son por este decreto establecidos y declarados a ser acequias públicas. [That all rivers and streams of water in this Territory, formerly known as public ditches (*acequias*), be, and are hearby [sic] established and declared to be public ditches (*acequias*). Sec. 21, Act of 7th Jan. 1852, "El arreglo de las acequias que ya están trabajadas quedar establecido tal como se hizo y permanace hast ahoy….[the regulations of ditches (*acequias)* which have been worked, shall remain as they were made and remain up to this day….] Quoted from José Rivera, *Irrigation Communities of the Upper Rio Grande Bioregion: Sustainable Resource Use in the Global Context,* 36 NAT. RESOURCES J. 731, 737-8 (1996).

[67] N.M.STATUTE ANNOTATED §72-1-1 to §72-19-103.

[68] N.M. CONST. Art. XVI, §2.

approving a severance and transfer of water rights. This does not resolve all disputes between the culture and life within the ancient *acequia* societies and the modern demands for water.[69] When one *parciante* within an *acequia* no longer takes its diversion of water and no longer assumes its responsibilities, it creates technical difficulties for water conveyance and increases the maintenance burdens for the remaining *parcientes.*

The legal issues created when an equitable system of water rights held by the members of the *acequia* community are incorporated into the quantitative rights system of prior appropriation are presented in the state of New Mexico. State law permits individuals to sever and sell water rights. Yet, the priority right may be held by the *acequia* Association with individuals having shares of that right or it may be held by the *parciantes*. These issues remain to be resolved.

Moroccan Springs

In the piedmont region of Morocco springs supply water for irrigation. Geertz[70] reports on two systems for allocation of water rights among the local farmers. The first is a timed system, *l-ma dyal s-sa'a* (water by the hour) or *b-l magana* (by the clock) and the second is a queue system called *mubih*.[71] Within each system "the underlying principle…is individual personal ownership of water … underneath them all is the concept that water, like land, housing, clothing,…is property, something that someone owns." The right to water may be bought, sold, leased, loaned and inherited separate from land because it is private property.[72]

The timed system, *l-ma dyal s-sa'a*, is based on water delivery from a particular spring measured by the flow of the ditch for a specified amount of time. The time for water delivery is scheduled at fixed intervals so that a water right might be scheduled for nighttime on Wednesday

[69] *See* RIVERA *supra* note 47 Ch. 5 & 6 for a discussion of current and anticipated future difficulties for *acequias.*
[70] Clifford Geertz, *The Wet and the Dry: Traditional Irrigation in Bali and Morocco,* Human Ecology Vol. 1, No. 1 at 23 (1971).
[71] *Id*.
[72] *See* World Water Development Report *supra* note 29.

for 3 ½ hours and again every 6 days. All users have ownership of the diversion rights as measured by the diversion system.

The queue system, *mubih*, establishes a rotation of users from a particular ditch. Each water right holder receives sufficient water to irrigate his land then the water flows down the ditch to the next land and continues in turn along the ditch system until it is again the turn of first land owner. Each water right is for a particular purpose. If additional water is needed because of a change in use or for a particular purpose such as planting, the owner negotiates with the other users along the ditch. An observer of this system describes it as characterized by trading and bargaining.[73] The system or combination of systems is particular to the spring and the community that relies on that spring.

In 1995 Morocco adopted a national Water Law to regularize what were characterized as haphazard water laws. The Water Law confirms that all waters are under the public domain and are not subject to private ownership. Use is by concession and payment of charges. However, the Water Law recognizes ancient customary rights whether or not registered with the national government.[74] The local uses and water rights developed by custom have been incorporated in each national water law of Morocco which is continued by the current Water Law.[75] The property rights developed at the local level remain intact within a system of state ownership of the resource.[76]

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[73] *Id.*
[74] SALMAN M.A. SALMAN & DANIEL D. BRADLOW, REGULATORY FRAMEWORKS FOR WATER RESOURCES MANAGEMENT: A COMPARATIVE STUDY 85-92 (2006).
[75] Mahammed Rachid Doukkali, *Water Institutional Reforms in Morocco,* 7 WATER POLICY, IWA PUBLISHING 71 (2005).
[76] *Id.*

Subaks

Bali and Sri Lanka irrigation is organized using a communal system that delivers water from storage reservoirs or tanks to lands within a well defined service area. Irrigation is part of a complex cultural and religious society.[77] Within Bali the *subak* irrigation system provides each landowner within the *subak* an equal right to enough water to irrigate his rice fields. Bali has an abundance of water in its equatorial climate however the timing of delivery of water is critical to the maintenance of rice production. The *subak* system is locally organized with each land owner having a share of responsibility for construction and maintenance of the irrigation system. The amount of water is allocated annually after negotiations with farmers and officials based on the land area to be irrigated. Minor adjustments are made over time to allow for differing soils and drainage features on individual lands permitting more or less water to be diverted by the irrigators. The collective system assigns a water right to each plot of land that remains with the land if the land transfers ownership. The *subak* also includes social, cultural and religious relationships to water. All irrigators within one *subak* plant at the same coordinated time which is also coordinated with *subaks* within the same region using common water resources.

Vermillion reports on a group of Balinese farmers who migrated to North Sulawesi, Indonesia and started the *subak* system on new parcels of land.[78] The water requirements and timing of deliveries had to be established for each new field. The farmers are described as "borrowing" water from their neighbors or from the system until the fields were adequately prepared and drainage patterns established. In summary, the Bali system of "rights" is one that

[77] *See* Geertz *supra* note 61, Douglas L. Vermillion, *Water Rights in the State of Nature: Emergent Expectations in an Indonesian Settlement,* Ch. 2 in NEGOTIATING WATER RIGHTS *supra* note 19, H.L. Joep Spiertz, *Water Rights and Legal Pluralism: Some Basics of a Legal Anthropological Approach,* Ch. 6 in NEGOTIATING WATER RIGHTS *supra* note 19.

[78] Douglas L. Vermillion, *Water Rights in the State of Nature: Emergent Expectations in an Indonesian Settlement,* Ch. 2 in NEGOTIATING WATER RIGHTS *supra* note 19.

attaches sufficient water to the land parcel to produce rice.[79] When lands are uniform, each parcel receives the same amount of water, when the lands vary in their characteristics the amount of water necessary to grow rice is adjusted.[80] The "rights" within a *subak* are enforced through a complex structure of societal norms and religious practices.

The tank system in Sri Lanka is similar in its organization to the *subaks* of Bali, however the availability of water each season is more variable.[81] Sri Lanka "is renowned for its hydraulic civilization in which natural resources have been managed over thousands of years."[82] The system of water allocation in Sri Lanka is characterized by seasonal planning. Like Bali, an ancient system of "tanks" captures water during the rainy season.[83] The tank system permits farmers to determine the available supply of water for irrigation during the dry season. At the beginning of each irrigation season, the farmers, sometimes along with government representatives, meet and negotiate the distribution of the available supply. "Underlying water allocation for irrigation are two generally recognized principles. The first is that of equity of water distribution. Equity is defined as ensuring that every farmer gets water in proportion to landholdings and second, priority is given to standing crops over those not yet planted."[84]

This system developed to meet the needs of the local communities and is described as "suited to irrigation systems with storage capacity, a single dominant crop, and variable water supplies."[85] The water resources are managed as a public good with users continuing the centuries old practice of contributing to maintenance of the systems for storage and delivery but

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[79] *Id.*
[80] H.L. Joep Spiertz, *Water Rights and Legal Pluralism: Some Basics of a Legal Anthropological Approach,* Ch. 6 in NEGOTIATING WATER RIGHTS *supra* note 19.
[81] Jeffrey D. Brewer, *Negotiating Seasonal Water Allocation Rules in Kirindi Oya, Sri Lanka,* Ch. 4 in NEGOTIATING WATER RIGHTS *supra* note 19.
[82] WORLD WATER DEVELOPMENT REPORT 418 *supra* note 29.
[83] *See Gabcíkovo-Nagymaros, separate opinion of Vice President Weeramantry* for a description of the history of the tank system in Sri Lanka.
[84] *Id.* at 118.
[85] *Id.* at 112.

do not make any payment for water use.[86] Sri Lanka is attempting to implement a new water law to accommodate changes in use from agriculture to industrial uses within the southern Ruhuna Basins.[87] The centuries old system which provides water for social and cultural uses in addition to agriculture may be difficult to change. Fears over the loss of these traditional rights prevent acceptance among many farmers.[88]

Riparian Rights

In the water rich eastern region of the United States water rights are based common law riparian principles.[89] The use of a watercourse is an aspect of the ownership of riparian land provided that the water is used on riparian lands.

Riparian law in the United States is based on the English common law of natural flow.[90] Each riparian has a right to the natural flow of an undiminished watercourse adjacent to his property. Diversions for domestic use and irrigation of personal garden plots are permissible uses even though the natural flow is somewhat diminished. However, return flows from riparian lands theoretically replenish the watercourse and are available for use downstream. Riparian law based on natural flow fostered navigation and mill use, but did not accommodate consumptive use[91] of water for other economic purposes.

As waterways lost significance for navigation and "milling," the common law changed from riparian rights based on natural flow to rights based on reasonable use. The concept of reasonableness is discussed more fully in connection with utilization of an international

[86] WORLD WATER DEVELOPMENT REPORT 421-423 *supra* note 29.
[87] *Id.* at 195.
[88] *Id.* at 375.
[89] SAX ET AL. AT CH. 2 *supra* note 36, GETCHES (1997) Ch. 2 *supra* note 35.
[90] *Id.* at 29.
[91] "Consumptive use" is a term used to describe the amount of water diverted from the watercourse, less return flows.

watercourse,[92] but for this purpose reasonableness is measured by the impact of one use on the uses by other riparians.[93] If one property owner diminishes the flow of the watercourse such that another riparian may no longer use her water in the same reasonable manner as before the new use may be unreasonable. It is a comparative determination. What constitutes a reasonable use has changed as the economics of water use and the demands for water for economic development have changed. However, within a riparian system users who comply with the requirements for land ownership and make a reasonable use of the water obtain water rights which they are able to protect from interference by others using the same watercourse.[94]

The reasonable use standard is enforceable in tort by the riparians who are impacted by a use alleged to be unreasonable. This one-on-one enforcement does not promote economic development or efficiencies within a watercourse. Today, most states following the riparian doctrine of reasonable use have assumed control of water resources and issue water permits.[95]

Conclusion

The above examples illustrate that legal rights to water are established under different legal systems from the bottom-up by the users within a local area. This is "water law" throughout the world. The governmental system of laws often recognizes and incorporates the local water law within the regulatory scheme. In the case of prior appropriation, the courts acknowledged and accepted the system of water allocation in existence along the streams which was then adopted and adapted in other states and incorporated into state constitutions and legislation. The *acequias* exist within a state system of prior appropriation and as demand for water continues to grow in this region of the United States, the policy decisions must be made to

[92] *See* Chapter Two infra.
[93] Reasonableness also includes the principle that waste is prohibited. What is "waste" is determined by the impact on other uses.
[94] See SAX ET AL. AT CH. 2 *supra* note 36.
[95] *Id.* at 101-118.

maintain the community system or defeat it by permitting individual sale and transfer of water rights from within the *acequia* communities. The 1995 Water Law of Morocco incorporates the local traditional uses including the private property rights to water which are contrary to the national policy. Reports from Sri Lanka indicate that farmers who rely on the traditional local water law are resisting national efforts to implement a national water policy that might alter their traditional rights. Local water laws become an aspect of community and support traditional users. In locations of variable water availability such as Bali and Sri Lanka, the variability is incorporated within the water allocation system. As water availability becomes more variable throughout the globe, those local laws that are the strongest and provide the most protection against loss of water may be the most resistant to the changes required to adapt to changing conditions. It is at the local water user level that adaptation to global climate change must occur.

The next section moves to the opposite end of the pluralistic legal structure; the allocation of water among states sharing a common watercourse. It examines the international law of equitable and reasonable utilization asking if the state has a "right" to water in the same sense as the private property rights recognized at the local level in the examples of prior appropriation and the Moroccan springs discussed above or is international water law more like the traditional law of riparian rights based on reasonable use. This begins with a look at the customary international law of equitable and reasonable utilization of an international watercourse.

Chapter Two: International Water Law

This chapter discusses the two major principles of international water law as codified in the 1997 United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses;[96] equitable and reasonable utilization and the prevention of significant harm to other riparians. As of this writing the 1997 UN Convention has not entered into force[97] however it remains the primary authority for international water law. The Convention is based on draft articles prepared by the International Law Commission after 20 years of extensive study of international agreements and practices.[98] It was approved by resolution of the United Nations General Assembly on May 21, 1997 after negotiations in the Sixth Committee convened as a Working Group of the Whole in which all states had the opportunity to participate.[99] The principles upon which it is based were discerned by the ILC from state practice and have crystallized into customary international law.[100]

This chapter first examines the origins of the doctrine of equitable and reasonable utilization in the work of the International Law Association and the International Law Commission and then examines the meaning of "equitable" separate from the meaning of "reasonable" in relation to utilization of watercourses. With this background, Chapter three uses the litigation over the Vermejo River in the state of New Mexico to discuss the vertical pluralism on a transboundary watercourse. This builds a foundation for a discussion of the complexity of water law.

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[96] United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses, UN Doc. A/RES/51/869, May 21, 1997, 36 ILM 700 (1997), hereafter 1997 UN Convention.
[97] The 1997 Convention enters into force on the deposit of the thirty-fifth instrument of ratification, acceptance, approval or accession. Art. 36(1). As of April 7, 2009 there are 16 parties and 16 signatories.
[98] The UN charge to the ILC to consider this topic was contained in General Assembly Resolution 2669 in 1970. The ILC referred a complete set of draft articles to the General Assembly for consideration in 1994.
[99] STEPHEN C. MCCAFFREY, THE LAW OF INTERNATIONAL WATERCOURSES 359 (2nd 2007).
[100] *Id.* at 375-377.

Equitable and reasonable utilization

Equitable and reasonable utilization is a comparative principle by which a use or a planned use in one state is measured against uses in other watercourse states.[101] As discussed in the following section, "equitable utilization" and "reasonable utilization" are different comparative standards, however, international instruments and publicists use the terms together and sometimes interchangeably.[102]

The equitable and reasonable standard may be more effective when applied in the negative to determine which uses are **not** equitable and reasonable. The International Court of Justice made such a determination in the *Danube Case*[103] when it was asked to determine whether a diversion by Slovakia was an equitable and reasonable utilization of the Danube.

In 1977 Czechoslovakia and Hungary entered a treaty for the joint development of the Danube to improve navigation, provide flood control and produce hydropower.[104] The works were to be headed by a dam at Dunakiliti to divert the flow through a canal to a hydroelectric plant at Gabčíkovo constructed by Czechoslovakia. The works contemplated by the 1977 Treaty terminated with a dam downstream at Nagymaros to be constructed by Hungary.[105] When Hungary failed to complete the works at Dunakiliti and failed to construct the dam at Nagymaros in violation of the treaty, Czechoslovakia proceeded to construct a diversion dam wholly within its territory at Čunovo in order to use the facility at Gabcíkovo and partially develop the hydropower aspects of the project. The Čunovo Dam diverted eighty to ninety percent of the flow of the Danube into a canal in Czechoslovakia to supply the hydropower plant at Gabcíkovo

[101] STEPHEN C. MCCAFFREY, THE LAW OF INTERNATIONAL WATERCOURSES, NON-NAVIGATIONAL USES 325 (2000), *see also* 1997 UN Convention, Art. 6.
[102] *See* 1997 UN Convention Arts. 5 and 6; MCCAFFREY *supra* note 96, Ch 9.
[103] *Case concerning the Gabčíkovo-Nagymaros Project* (Hungary v.Slovakia) at par. 78-79, Sept. 25, 1997, 1997 ICJ 7, *hereinafter Danube Case.*
[104] Treaty concerning the Construction and Operation of the Gabčíkovo-Nagymaros System of Locks (1977), 32 ILM 1247 (1993).
[105] *Danube Case supra* note 98, Sketch Map No. 1.

before returning the flow to the Danube downstream. The 1977 Treaty calls for diversion of this same amount of water from the joint dam at Dunakiliti, however since the Čunovo diversion was not a joint work the ICJ determined that it was not part of the treaty regime. Therefore, the ICJ applied the customary international law principle of equitable and reasonable sharing of an international watercourse concluding that the unilateral assertion of control over the river by Czechoslovakia was an internationally wrongful act which deprived Hungary of its equitable and reasonable share of the watercourse.[106]

This case provides guidance about the meaning of equitable and reasonable utilization. First the ICJ determined that as a matter of international law each state has a "basic right to an equitable and reasonable sharing of the resources of an international watercourse."[107] Second, the Court held that a unilateral diversion of 80 to 90 percent of the flow deprived the downstream state of its share of the watercourse.[108] The Court did not establish what would have been an equitable or reasonable diversion, instead, the Court urged the parties to continue to cooperate to reach an agreement for the continued operation of the works as constructed.[109]

Equitable and reasonable utilization are recognized by the Court as principles of customary international law that have crystallized and been codified in the 1997 UN Convention. The following section discusses *equitable* utilization and *reasonable* utilization as two distinct standards. The former is based on the principles of equitable apportionment developed in the litigation between states of the United States and the latter based on the principles of riparian law.

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[106] *Danube Case supra* note 98, at par. 85.
[107] *Id.* at par.78
[108] *Id.*
[109] *Danube Case supra note 98,* at par. 141-142. *See* MCCAFFREY *supra* note 96 at 186-197.

The ILC preparatory work for the 1997 Watercourse Convention developed the term "equitable and reasonable utilization" but focused on equitable utilization in the commentary with little discussion of the term reasonable.[110] The discussion of *reasonable use* which follows is primarily based on riparian law in the United States. As is discussed below, the determination of *reasonable use* at the user level informs the meaning of *reasonable utilization* of an international watercourse.

Equitable utilization

McCaffrey and others[111] have written extensively on equitable utilization and the counterpart in the domestic law of the United States, equitable apportionment. This section briefly describes equitable utilization.

> Born of the U.S. Supreme Court's decisions in interstate apportionment cases beginning in the early twentieth century, and supported by decisions in other federal states, the doctrine of equitable utilization was applied to international watercourses as the basic, governing principle by the International Law Association's 1966 Helsinki Rules. Its status as the fundamental norm in the field has recently been confirmed by the decision of the International Court of Justice in the *Case concerning the Gabcíkovo-Nagymaros Project* (Hungary/Slovakia)….[T]he 1997 UN Convention also appears to treat equitable utilization as the overarching principle governing the use of international watercourses, as did the draft articles adopted by the ILC on second reading in 1994.[112]

The International Law Commission notes that the rule of equitable utilization can not be applied unilaterally by any state to determine "the amount of water a State may divert, the quality of water to which it is entitled, or the uses it may make of an international watercourse."[113] Implementation of this standard "depends ultimately upon the good faith and

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[110] *See infra* text accompanying notes ____

[111] *See* ATTILA TANZI & MAURIZIO ARCARI, THE UNITED NATIONAL CONVENTION ON THE LAW OF INTERNATIONAL WATERCOURSES Ch. 3 (2001), RESOLUTION OF INTERNATIONAL WATER DISPUTES, (The International Bureau of the Permanent Court of Arbitration ed. 2002).

[112] MCCAFFREY *supra* note 96 at 324-325.

[113] Stephen C. McCaffrey, Special Rapporteur, *Third report on the law of the non-navigational uses of international watercourses,* 1987 Y.B. INT'L L. COMM'N (Vol. 2, Pt. 1) at 22, U. N. Doc A/CN.4/406 and Add. 1 and 2 *herinafter* McCaffrey ILC Third Report.

co-operation of the States concerned."[114] Equitable utilization is also described as a *post hoc* measure and a standard to be used by a third party to resolve a dispute among a limited number of conflicting uses. It is difficult to apply prospectively.

McCaffrey says, "According to the doctrine of equitable utilization, each state has a legally protected interest in an equitable share of the uses and benefits of an international watercourse."[115] The comparative basis of this standard is discussed below, but first a more in-depth look at reasonable utilization.

Reasonable utilization

Turning now to the concept of reasonable utilization; reasonableness is a legal standard under domestic law in the United States for individual conduct when determining negligence or liability. Tort law requires an examination of all the facts and circumstances measuring the act against an "objective" standard of a reasonable person in the same situation. Riparian rights are based in tort. Reasonable use is not "immoderate" or "excessive."[116] It is defined as "fair," "proper," "just," "moderate," "suitable under the circumstances," being synonymous with "equitable."[117]

For purposes of this deconstruction of "equitable and reasonable utilization" the author does not assume that the two terms are synonymous for to do so would mean one or the other is irrelevant to the law of international watercourses. Whereas equitable utilization may be conceptualized as dividing the whole of the watercourse among the watercourse states and other watercourse interests such as ecological preservation, fisheries and navigation, reasonable

[114] Stephen C. McCaffrey, Special Rapporteur, *Second report on the law of the non-navigational uses of international watercourses,* 1986 Y.B. INT'L L. COMM'N (Vol. 2, Pt. 1), U. N. Doc A/CN.4/399 and Add. 1 and 2, at 132 par. 177 note 39 *herinafter* McCaffrey ILC Second Report.
[115] MCCAFFREY *supra* note 96 at 329.
[116] BLACK'S LAW DICTIONARY 1265 (6th ed. 1990).
[117] *Id.*

utilization looks at water applied for a particular purpose to determine if the purpose for which the water is being used is reasonable given the facts and circumstances on the river.

Reasonable as a riparian standard

Reasonable is a term of art in riparian water law in the United States. It is not the focus of this paper to explore the derivation and nuances of *reasonable* within the laws of the various states of the United States. Therefore the following discussion of *reasonable use* in riparian law is based on those common law principles set forth in the American Law Institute Restatement (First[118] and Second[119]) of the Law of Torts.

The standard of reasonableness developed in the courts to resolve disputes between two competing users. The party alleging injury must first establish that her use of water is reasonable and second, that the other party's use interferes with her reasonable use.[120] If the complaining party cannot establish that her water use is reasonable she does not have a legally protected interest. This initial determination is not a comparative analysis and is based on the first four factors of §850A: "the purpose of the use, the suitability of the use to the watercourse or lake, the economic value of the use, [and] the social value of the use."[121]

This basic principle of reasonable use in riparian law is set forth the Restatement Frist, as follows:

> *The Reasonable Use* theory. Under the Reasonable Use theory the primary or fundamental right of each riparian proprietor on a watercourse or lake is merely to be free from an unreasonable interference with his use of the water therein. Emphasis is placed on a full and beneficial use of the advantages of the stream or lake, and each riparian proprietor has a privilege to make a beneficial use of water for any purpose, provided only that such use does not unreasonably interfere with the beneficial uses of others. Reasonable use is the only measure of riparian rights. Reasonableness, being a question of fact, must be determined in each case on the peculiar facts and circumstances of that

[118] RESTATEMENT (FIRST) OF TORTS §§850-857 (1939).
[119] RESTATEMENT (SECOND) OF TORTS, §§841-848, Introductory Note (1979).
[120] RESTATEMENT (SECOND) *supra* note 114, §850 comment *c*.
[121] RESTATEMENT (SECOND) *supra* note 114 at §850A (a)-(d).

> case. Reasonableness is determined from a standpoint of a court or jury and depends not only upon the utility of the use itself, but also upon the gravity of its consequences on other proprietors.[122]

Conflicts over the use of a watercourse are resolved by first examining if the use by the complainant is reasonable. If not, the complainant does not have a legal interest in the water that the court will protect. The reasonableness of the interfering use is then examined. If both uses are reasonable and they conflict, the court uses the factors in Restatement Second Torts §850A[123] to determine an equitable solution.

The reasonable use theory of riparian law contains three basic principles; 1) water is shared by riparians on an equitable basis, 2) no single user may unreasonably interfere with the reasonable use of another riparian, and 3) if there are conflicting uses the utility of the use must outweigh the gravity of the harm in order to be considered reasonable.[124]

Another point of note in the Restatement First description of reasonable use quoted above is the type of legal right held by a riparian. "[E]ach riparian proprietor has a privilege to make a beneficial use of water for any purpose provided only that such use does not unreasonably interfere with the beneficial uses of others."[125] This privilege is shared by all riparians on a watercourse.[126] It is a privilege because each riparian may exercise it, but each of the uses is subject to being reduced or defeated when another riparian holding the same privilege exercises hers. Each riparian may interfere with the use by each other riparian so long as the use is reasonable. If one use is not reasonable there is no legal privilege or right to continue the use and an injunction may issue. If both uses are reasonable a conflict of uses is resolved by an

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[122] RESTATEMENT (SECOND) *supra* note 114, Introductory note at 211.
[123] *See* Table 1 at the end of Ch. 2.
[124] RESTATEMENT (SECOND) *supra* note 114, §852 . The balance of benefit against harm creates a similar balance presented by the tension between Article 5 of the 1997 UN Convention, Equitable and Reasonable Utilization, and Article 7, Prevention of Significant Harm.
[125] RESTATEMENT (FIRST) *supra* note 113, §850 Scope note.
[126] See text accompanying notes___-__. (Chapter 4 Hohfeld)

examination of "the practicality of avoiding harm by adjusting the use or method of use"[127] and "the practicality of adjusting the quantity of water used by each proprietor." In the event an equitable adjustment is not possible to permit both uses to continue simultaneously the factors of §850A are used. These situations are explained as follows:

> If two uses can coexist, because one causes no substantial harm to the other, or because harm can be avoided by adjusting the quantity or method of one use or the other or because sharing a temporarily short supply is reasonable, the rights may be said to be equal. If, however, the normal water supply is insufficient for all potential uses, equal treatment may be impossible. One riparian's right to make a new use may be affected by the fact that other riparians have already put the water to use. To allow the new use will wholly or partially destroy the existing use or take one riparian's supply of water from him and give it to the new user. In these cases the law must choose one use or the other on the basis of the factors stated in §850A, Clauses (h) and (i), and discussed in the Comments to those Clauses.[128] [§850A is reproduced at the end of this chapter.]

A water right based on reasonable use is a comparative standard under which "one cannot always be absolutely sure just what uses he can or cannot lawfully make of the water; and even though a use may, in its inception, be reasonable, circumstances may change to such an extent that it will become unreasonable."[129]

***Reasonable* in international instruments**

The term *reasonable* as used to describe the utilization of an international watercourse appears in draft articles prepared by the International Law Commission without definition or much explanation. In contrast, the term "equitable" is discussed extensively with a significant body of state practice, case law from federal states, and treaty language to assist with the interpretation. This section will trace the inclusion of *reasonable utilization* in the 1997 UN Convention as a separate concept from equitable utilization.

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[127] RESTATEMENT (SECOND) *supra* note 114, §850A(f).
[128] RESTATEMENT (SECOND) *supra* note 114, §850 comment *f.*
[129] RESTATEMENT (FIRST) *supra* note 113, Scope Note at 346.

Helsinki Rules: The Helsinki Rules[130] adopted by the International Law Association in 1966 were the first comprehensive documentation of legal principles for utilization of international watercourses. Article IV provides that "each basin State is entitled, within its territory, to a reasonable and equitable share in the beneficial uses of the waters of an international drainage basin."[131] Article V indicates that "what is a reasonable and equitable share within the meaning of article IV [is] to be determined in the light of all the relevant factors in each particular case…."[132]

Reasonable as used in Articles IV and V relates to each state's share of water. The factors to determine that share are listed in Article VI and include "the comparative costs of alternative means of satisfying the economic and social needs of each basin State,[133] the availability of other resources, [134] the avoidance of unnecessary waste in the utilization of waters,[135] the practicability of compensation to one or more of the co-basin States as a means of adjusting conflicts among uses;[136] and the degree to which the needs of a basin State may be satisfied, without causing substantial injury to a co-basin State."[137] These factors are very similar to the factors in the Restatement that determine the reasonableness of a riparian right.[138]

Reasonableness as a measure of use is reinforced by examining Articles VII, VIII, and X of the Helsinki Rules. Article VII provides that the "present reasonable use" of a watercourse

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[130] INTERNATIONAL LAW ASSOCIATION, REPORT OF THE FIFTY-SECOND CONFERENCE, Helsinki, 484 (1966) International Law Association, 1966
[131] *Id.*at Art. IV.
[132] HELSINKI RULES *supra* note 125, Art. V.
[133] *Id.* at Art. V (2)(g).
[134] *Id.* at Art. V (2)(h).
[135] *Id.* at Art. V (2)(i).
[136] *Id.* at Art. V (2)(j).
[137] *Id.* at Art. V (2)(k).
[138] RESTATEMENT (SECOND) *supra* note 114, §850A.

cannot be denied in order to reserve water for future uses in another state.[139] Article VIII, paragraph 1 provides that "an existing reasonable use may continue in operation unless the factors justifying its continuance are outweighed by other factors leading to the conclusion that it be modified or terminated so as to accommodate a competing incompatible use."[140] Modifying "use" with *reasonable* indicates that only reasonable uses are protected. This is reinforced in Paragraph 3 of Article VIII confirming that a use that is not reasonable does not receive legal protection, "A use will not be deemed an existing use if at the time of becoming operational it is incompatible with an already existing reasonable use."[141] The concept of reasonableness as used in the Helsinki Rules appears to be the basic measure of an equitable share in the same manner it is the measure of a riparian right.

The next sections trace the incorporation of *reasonable* in the work of the International Law Commission which led to the draft articles adopted by the UN General Assembly as the 1997 UN Convention.

Schwebel, ILC Draft Articles: In 1981 Special Rapporteur Stephen Schwebel included in his Third Report[142] the first complete set of draft articles on the Law of Non-Navigational Uses of International Watercourses.[143] This draft does not use the word *reasonable* to modify or describe utilization of an international watercourse. Draft Article 6, Equitable participation, provides:

1. The waters of an international watercourse system shall be developed and used by system States on an equitable basis with a view to attaining optimum utilization of

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[139] HELSINKI RULES *supra* note 125, Art. VII.
[140] *Id.* at Art. VIII(1).
[141] *Id.* at Art. VIII(3). This subparagraph implies that the first use on a watercourse has a priority over later uses so long as it remains reasonable.
[142] Stephen M. Schwebel, Third Report on the Law of Non-Navigational Uses of International Watercourses, U.N.Doc. A.CN.4/348.
[143] *Id.*

those waters, consistent with adequate protection and control of the components of the system.

2. Without its consent a State may not be denied its equitable participation in the utilization of the waters of an international watercourse system of which it is a system State.
3. An equitable participation includes the right to use water resources of the system on an equitable basis and the duty to contribute on an equitable basis to the protection and control of the system as particular conditions warrant or require.[144]

The Schwebel commentary on this draft article indicates that the "right of each State to share equitably in the uses of the waters of an international watercourse system is indisputable and undisputed"[145] explaining that States have the right to "reasonable and equitable sharing of the uses of the waters."[146]

Schwebel discusses the Helsinki Rules and ILA Commentary thereon regarding equitable and reasonable use[147] yet the concept that use by each basin state must be reasonable was not included in his Draft Articles. Schwebel discusses of *reasonable use* as the basis of the United States argument in the dispute with Canada over the Kootenay River,[148] but uses this discussion to support *equitable use* in the draft articles. However, the factors for determination of an equitable use incorporated in the Schwebel Draft Article 7 include those from the Helsinki Rules which are very similar to the factors used to determine the reasonableness of a riparian use. These include: comparison of uses by other states,[149] the "social and economic need for the particular use,"[150] the "efficiency of use of water resources of the system,"[151] and the potential of

[144] Schwebel Third Report *supra* note 137, par. 86.
[145] *Id.* at Par.85.
[146] *Id.*
[147] *Id.* at Par. 96-98.
[148] *Id.* at Par. 100.
[149] *Id.* at Par. 106, Art 7(iv).
[150] *Id.* at Par. 106, Art. 7(v).
[151] *Id.* at Par. 106, Art 7(vi).

the use to cause pollution.[152] Each of these factors relate to the use of water within a State, which may be a measure of *reasonableness*.[153]

Evensen, ILC Draft Articles:[154] In 1984 the ILC Special Rapporteur Jens Evensen prepared a revised set of draft articles. His Article 6 includes *reasonable* as a measure of a state's share of an international watercourse.

> Article 6 General principles concerning the sharing of the waters of an international watercourse.
>
> 1. A watercourse State is, within its territory, entitled to a reasonable and equitable share of the uses of the waters of an international watercourse.[155]
> 2. To the extent that the use of the waters of an international watercourse within the territory of one watercourse State affects the use of the waters of the watercourse in the territory of another watercourse State, the watercourse States concerned shall share in the use of the waters of the watercourse in a reasonable and equitable manner in accordance with the articles of the present Convention and other agreements and arrangements entered into with regard to the management, administration or uses of the international watercourse.[156]

Evensen introduces the term *reasonable* to the text of the draft articles but limits it in both paragraphs 1 and 2 to modifying the "share" of a watercourse that a state may use.

In Draft Article 7 Evensen[157] incorporates *reasonableness* as a limitation on the domestic use of an international watercourse:

> Article 7. Equitable sharing in the uses of the waters of an international watercourse. The waters of an international watercourse shall be developed, used and shared by watercourse States in a reasonable and equitable manner on the basis of good faith and good-neighbourly relations with a view to attaining optimum utilization thereof

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[152] *Id.* at Par. 106, Art 7(vii).
[153] The Schwebel Draft Articles rely on many of the same factors as the Helsinki Rules to determine "equitable use" to determine "reasonable use." However, the Schwebel Draft Articles are not as closely aligned with the concept of reasonableness from riparian law as are the Helsinki Rules.
[154] Jens Evensen, Second Report on the Law of the Non-Navigational Uses of International Watercourses, 1984, U.N. Doc. A/CN.4/381.
[155] *Compare* Helsinki Rules Art. IV "Each basin State is entitled, within its territory, to a reasonable and equitable share in the beneficial uses of the waters of an international drainage basin."
[156] Evensen Second Report *supra* note 149, at Par. 49.
[157] Jens Evensen, First Report on the Law of the Non-Navigational Uses of International Watercourses, 1984, U.N. Doc. A/CN.4/367, 1983 at Par. 87-93 and Evensen Second Report *supra* note 149, Par. 52-53.

consistent with adequate protection of the international watercourse and its components.[158]

Evensen first introduces this form of "legal standard"[159] directing how an international watercourse may be used within a state; it "shall be developed" and "used…in a reasonable and equitable manner…with a view to attaining optimum utilization."[160] This draft Article recognizes the interconnectedness of uses within each state, provides that each state may utilize its equitable and reasonable share **and** that each state's share must be used in an equitable and reasonable manner. Equitable and reasonable utilization are determined using a list of factors, many of which carry forward from the Helsinki Rules to the Schwebel draft articles. The Draft Article 8 factors for the "determination of reasonable and equitable use"[161] include "conservation by the watercourse state,"[162] a comparison of efficiencies of use among watercourse states,[163] pollution "as a consequence of the particular use,"[164] "other interference with or adverse effects, if any, of such use for the uses, rights or interests of other watercourse States,"[165] and the "availability to the States concerned and to other watercourse States of alternative water resources."[166] Each of the factors mentioned here relates to use of water within the state and may be used to determine if such domestic use is reasonable. There is some overlap in that some of the factors, such as the availability of other water resources may also be used to determine the equitable share for each state.

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[158] Evensen Second Report *supra* note 149, par. 52.
[159] Evensen First Report *supra* note 152, par. 87.
[160] Evensen Second Report *supra* note 149, par. 52.
[161] Evensen Second Report *supra* note 149, par. 55.
[162] Evensen Second Report *supra* note 149, par. 55, Art. VIII (e).
[163] *Id*. at Art. VIII (f).
[164] *Id.* at Art. VIII (h).
[165] *Id.* at Art. VIII (i).
[166] *Id.* at Art. VIII (j). This requirement is a further examination of water use within a state, requiring information on other available surface and groundwater resources.

Evensen may be credited with introducing the concept of *reasonable use* to the ILC draft articles regarding equitable use of an international watercourse and also for explicitly adding the important concept that uses within a watercourse state are to be reasonable.

McCaffrey, ILC Draft Articles: Special Rapporteur Stephen C. McCaffrey comments on the previous draft articles in his second report in 1986.[167] McCaffrey chronicles the changes from "shared natural resource" articulated by the first Special Rapporteur Richard D. Kearny and developed by Schwebel to the language of the most recent drafts "sharing in the use of waters in a reasonable and equitable manner."[168] He reviewed the draft articles by Evensen in light of strong State objections to the concept that an international watercourse is a "shared natural resource."[169] McCaffrey notes the work of Evensen to replace the language and concept of a watercourse as a shared natural resource with the principle that "States were entitled to a reasonable and equitable share of the benefits arising from an international watercourse."[170] McCaffrey states that "[T]he expression 'the watercourse system and its waters are…a shared natural resource' had been changed to 'the watercourse States concerned shall share in the use of the waters of the watercourse in a reasonable and equitable manner'"[171] in order to address state objections.

McCaffrey discusses two sides to equitable and reasonable utilization which he incorporates into a new draft Article 5. The first is that each state is entitled to an equitable and reasonable share of an international watercourse; the second is that no state is entitled to more

[167] Stephen C. McCaffrey, Second Report on the Law of the Non-Navigational Uses of International Watercourses, 1986, U.N. Doc. A/CN.4/399, Par. 71-75.
[168] *Id.* at Par. 38.
[169] *Id.* at Par. 23.
[170] *Id.* at Par. 23.
[171] *Id.* at Par. 14 discussing Evensen Second Report *supra* note 149, par. 55.

than its share or to a share that interferes with another states' equitable and reasonable share.[172] McCaffrey includes an extensive survey and discussion of treaties, positions taken in diplomatic exchanges, state practice, judicial decisions, arbitral awards, other international instruments, the views of publicists and municipal court decisions.[173] Based on this extensive survey McCaffrey concludes:

> It is clear…that there is overwhelming support for the doctrine of equitable utilization as a general, guiding principle of law for the determination of the rights of States in respect of the non-navigational uses of international watercourses.[174]
>
> The bedrock upon which the doctrine of equitable utilization is founded is the fundamental principle represented by the maxim *sic utere tuo ut alienum non laedas.* As seen above, this maxim is a generally accepted principle of law governing the relations between States. In the context of the use of a watercourse which separates or traverses two or more States, this means that one of those States may not use or permit the use of the watercourse in such a way as to cause injury to the other(s). Thus the States are referred to as having "equal" or, perhaps more accurately, "correlative" rights in respect of use of the watercourse, a concept which finds expression in the doctrine of limited territorial sovereignty: a State has the sovereign right to make whatever use it wishes of waters within its territory, but that right is limited by the duty not to cause injury to other States.[175] (*citations omitted)*

McCaffrey goes on to discuss the parameters of equitable use in this second report[176] but does not discuss in this or later reports the addition of the requirement of reasonable use to the draft of what became Article 5 of the 1997 UN Convention.

What may appear as a subtle change in wording from the Evensen draft Article 6 to the McCaffrey draft Article 5 may in fact be a change in meaning with the new Article 5 reflecting more the concept of domestic water use contained in the Evensen Article 7 with the understanding that an equitable apportionment must take place in order for there to be an equitable and reasonable domestic utilization.

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[172] *Id.* at Par. 75.
[173] *Id.* at Par. 75-168.
[174] *Id.* at Par. 170.
[175] *Id.* at Par. 171.
[176] *Id.* at Par. 169-178.

The Draft articles as reported to the General Assembly and as adopted in the 1997 Convention 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 of 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.[177]

It appears from the plain language of the first sentence of the first paragraph that the Convention sets a standard for the domestic use of water within a watercourse state vis-à-vis other states. This incorporates the concepts from Evensen Article 7. The principle contained in this first sentence of Article 5, does not receive consideration in the reports or commentary.[178]

As with drafts prepared by each of the previous special rapporteurs, McCaffrey includes a non-exclusive list of factors to determine equitable and reasonable utilization. Four of the listed factors apply directly to domestic water use: "the effects of the use or uses of the watercourse in one watercourse State on other watercourse States;"[179] the "existing and potential uses of the watercourse;"[180] the "conservation, protection, development and economy of use of the water

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[177] Y.B. I.L.C. 1991, A/CN.4/SER.A/1991/Add.1 (Part 2), Part D. The only change made prior to the adoption by the UN General Assembly is the addition of a phrase in paragraph 1 so that the last clause reads: "with a view to attaining optimal *and sustainable* utilization thereof and benefits therefrom, *taking into account the interests of the watercourse States concerned,* consistent with adequate protection of the watercourse."
[178] The author may only speculate about what is not included in the commentary, however, it may be that a more explicit explanation of the obligation imposed on domestic water use would have received objections from states.
[179] Text of the Draft Articles Provisionally Adopted by the Commission on the First Reading, *Report of the International Law Commission on the work of its forty-third session (29 April-19 July 1991)* U.N. Doc. A/46/10 1991 at 66, Art. 6(c).
[180] *Id.* Art. 6(d).

resources of the watercourse and the costs of measures taken to that effect;"[181] and "the availability of alternatives, of corresponding value, to a particular planned or existing use." [182]

The ILC submitted its report to the General Assembly on the Law of the Non-navigational Uses of International Watercourses in 1994.[183] Each draft article recommended to the General Assembly is followed by extensive commentary indicating that each watercourse state may use an equitable portion of the watercourse but not elaborating on the "reasonable" aspects of the provision. The first sentence of Article 5 requiring that "[w]atercourse states shall in their respective territories utilize an international watercourse in an equitable and reasonable manner" is the same as developed in the McCaffrey Draft Articles.[184]

Conclusion

The forgoing discussion demonstrates that the 1997 UN Convention includes the obligation for states to use an international watercourse reasonably. Equitable utilization and reasonable utilization are distinct concepts in domestic water law, the former is the standard for sharing or apportioning an international or interstate watercourse, the latter is the standard for use of that watercourse. In order to determine a *reasonable utilization* it is necessary to have information about domestic uses within each watercourse state. This may be a necessary intrusion on state sovereignty in order to attain "optimal and sustainable utilization"[185] of the international watercourse. The commentary to the 1997 UN Convention does not include a discussion of reasonable use. However, this is a long standing measure of water use in riparian law. The following chart demonstrates the similarities in the factors for determination of

[181] *Id.* Art. 6(f).
[182] *Id.* Art. 6(g).
[183] Report of the International Law Commission on the work of its forty-sixth session, 2 May-22 July 1994, U.N. Doc. A/49/10, Chapter III.
[184] *Compare* McCaffrey Draft Articles contained in 1994 ILC Report *supra* note 172 and Art. 5 of the 1997 UN Convention.
[185] 1997 UN Convention, Art. 5(1).

reasonable use in riparian law and the Article 7 factors from the 1997 UN Convention indicating that the history and development of *reasonable use* in domestic law as embodied in the Restatement First may inform determinations about what is *reasonable use* of an international watercourse.

Reasonable use is not a fixed standard or a quantified measure of water. The domestic riparian law standard of reasonableness is utilized on watercourses in regions with plentiful water supply. It is also a principle that may be used in circumstances when demand exceeds supply. For example, is it reasonable to continue to divert water to grow rice if the supply downstream is diminished to a point that it is insufficient to supply the population with drinking water? The principle of reasonable use may provide flexibility to require changes in use to meet changes in natural conditions and changes in use.

Following the chart, the next chapter discusses the comparative nature of water law based on equitable and reasonable use and the difficulties inherent in a comparative international legal standard.

Comparison of Restatement and International Factors for Reasonable Use

Restatement of the Law of Torts Second **§ 850A. Reasonableness Of The Use Of Water**		**1997 UN Convention** **Article 6** **Factors relevant to equitable and reasonable utilization**
The determination of the reasonableness of a use of water depends upon a consideration of the interests of the riparian proprietor making the use, of any riparian proprietor harmed by it and of society as a whole. Factors that affect the determination include the following: (a) The purpose of the use, (b) the suitability of the use to the watercourse or lake, (c) the economic value of the use, (d) the social value of the use, (e) the extent and amount of the harm it causes, (f) the practicality of avoiding the harm by adjusting the use or method of use of one proprietor or the other, (g) the practicality of adjusting the quantity of water used by each proprietor, (h) the protection of existing values of water uses, land, investments and enterprises and (i) the justice of requiring the user causing harm to bear the loss.		1. Utilization of an international watercourse in an equitable and reasonable manner within the meaning of article 5 requires taking into account all relevant factors and circumstances, including: (a) Geographic, hydrographic, hydrological, climatic, ecological and other factors of a natural character; (b) The social and economic needs of the watercourse States concerned; (c) The population dependent on the watercourse in each watercourse State; (d) The effects of the use or uses of the watercourses in one watercourse State on other watercourse States; (e) Existing and potential uses of the watercourse; (f) Conservation, protection, development and economy of use of the water resources of the watercourse and the costs of measures taken to that effect; (g) The availability of alternatives, of comparable value, to a particular planned or existing use. 2. In the application of article 5 or paragraph 1 of this article, watercourse States concerned shall, when the need arises, enter into consultations in a spirit of cooperation. 3. The weight to be given to each factor is to be determined by its importance in comparison with that of other relevant factors. In determining what is a reasonable and equitable use, all relevant factors are to be considered together and a conclusion reached on the basis of the whole.

Chapter 3: The Vermejo River

The Vermejo River litigation between the states of Colorado and New Mexico[186] in the United States poses a fact situation conducive to analyzing equitable apportionment and the requirements of reasonable use. It also demonstrates the vertical legal pluralism along a watercourse.

The Vermejo River is a small stream that originates in the snowmelt of the Sangre de Cristo Mountains of southern Colorado.[187] This tributary flows for a total distance of 55 miles, most of which is in New Mexico, before reaching the mainstream of the Canadian River. The facts regarding use of the Vermejo River are simple enough to permit a transparent examination of the relationships among the state laws of prior appropriation, the interstate law of equitable apportionment, and the requirements of reasonable use.

New Mexico and Colorado follow the law of prior appropriation, the first in time to use the water has a superior legal right. The priority dates and the quantification of the rights are determined in an adjucation, a court proceeding that brings all water users on the same watercourse into court together. The court enters a decree on which the priorities are listed chronologically along with a quantity of water which has been beneficially used. In the event of a shortage on the watercourse, the parties at the bottom of the decree with the latest priority dates are shorted water.

The New Mexico portion of the Vermejo River was adjudicated in New Mexico state courts and a water rights decree listing four water rights holders was entered in 1941.[188] The largest and most junior holder of water rights is the Vermejo Conservancy District, a federally

[186] Colorado v. New Mexico, 459 U.S. 176 (1982) (*Vermejo I)*; *following remand to Special Master,* Colorado v. New Mexico, 467 U.S. 310 (1984) (*Vermejo II).*
[187] *Vermejo I,*459 U.S. 176, 178.
[188] Phelps Dodge Corp. v. W.S. Land and Cattle Co., No. 7201 (D.C. Cty. Colfax 1941).

funded reclamation project that provides water through "an extensive system of canals and reservoirs"[189] for stock watering[190] and irrigated agriculture.[191] The four users have fully appropriated the Vermejo River the result of which is that any new use, whether in New Mexico or Colorado, reduces the available supply to the most junior rights holder, the Vermejo Conservancy District.[192]

In 1975 the state of Colorado granted Colorado Fuel and Iron Steel Corporation, (C.F. & I.) a Colorado corporation, a conditional water right to divert water from the Vermejo River, transfer the water out of the Vermejo River basin and use it in the Purgortoire River basin for industrial development.[193] The first litigation was filed by the four New Mexico water users against C.F. & I[194] based on a theory of transboundary prior appropriation.[195] Both New Mexico and Colorado follow the law of prior appropriation and this formed the basis of the district court order enjoining C.F. & I. from diverting any water that would violate the senior rights held by the four users downstream in New Mexico. C.F. & I. appealed, which appeal was stayed pending resolution of the equitable apportionment action in the United States Supreme Court which had been subsequently filed by the state of Colorado against the state of New Mexico.

The state of Colorado invoked the original jurisdiction of the United States Supreme Court to request an equitable apportionment of the Vermejo River.[196] The Court accepted jurisdiction and appointed Special Master Ewing T. Kerr to hear evidence and prepare a report which was submitted to the Court in 1982. The parties, Colorado and New Mexico, then

[189] *Vermejo I,* 459 U.S. 176, note 6.
[190] *Id.* at 192.
[191] *Id.* at 180.
[192] Justice Stevens in his dissent in *Vermejo II* disputes this fact based on the record of Special Master in his discussion of the unreasonable and wasteful uses in New Mexico, 467 U.S. 310, 334-336.
[193] In re the Application for Water Rights of C.F. & I. Corp. No. W-3961 (Dist. Ct., W. Div. No. 2, June 20, 1975).
[194] Kaiser Steel Corporation et al. v. C.F. & I. Steel Corporation, Civil No. 76-244 (D.N.M. 1978).
[195] *See,* Wyoming v. Colorado, 259 U.S. 419 (1922).
[196] *Vermejo I* 459 U.S. at 178.

appeared before the Court on exceptions to the Special Master's Report. The Court summarized the findings of the Special Master:

> "The Special Master found that most of the water of the Vermejo River is consumed by the New Mexico users and that very little, if any, reaches the confluence with the Canadian River. He thus recognized that strict application of the rule of priority would not permit Colorado any diversion since the entire available supply is needed to satisfy the demands of appropriators in New Mexico with senior rights. Nevertheless, applying the principle of equitable apportionment established in our prior cases he recommended permitting Colorado a transmountain diversion of 4,000 acre-feet of water per year from the headwaters of the Vermejo River. He states:
>
> > 'It is the opinion of the Master that a transmountain diversion would not materially affect the appropriations granted by New Mexico for users downstream. A thorough examination of the existing economies in New Mexico convinces the Master that the injury to New Mexico, if any, will be more than offset by the benefit to Colorado.'"[197]

To summarize further, the Special Master determined that Colorado has a right to an equitable share of the Vermejo River which the special Master determine to be 4,000 acre-feet per year. The common law of equitable apportionment as determined by the Supreme Court provides that each state has an equal right to share in the use of an interstate stream, even when use in one state interferes with uses in another state.[198] There must be a balancing of interests and benefits.

In the first case, *Vermejo I,*[199] the Court remanded to the Special Master requesting that he provide findings of fact for the Court sufficient to support his determination that an equitable apportionment of the Vermejo River would permit Colorado to divert 4,000 acre-feet per year. Justice O'Connor wrote a separate opinion in *Vermejo I* concurring in the remand, but questioning the finding of the Special Master that water use within the Vermejo Conservancy District in New Mexico was unreasonable and wasteful. Two years later, Justice O'Connor

[197] *Vermejo I* 459 U.S. at 180 quoting from the Report of the Special Master at 23.
[198] *See,* Kansas v. Colorado, 206 U.S. 46 (1907).
[199] *Vermejo I,* 459 U.S. 176.

wrote the majority opinion in *Vermejo II*[200] holding that Colorado had not met its burden of proof to establish that it was entitled to an equitable apportionment of the Vermejo River.

Taking these two cases together one discerns the following principles of equitable apportionment and of reasonable use that elaborate on the holding that "equitable apportionment will protect only those rights to water that are 'reasonably acquired and applied.'"[201]

Equitable Apportionment

The Court recounted the law of equitable apportionment as determined in previous cases, including the salient principles set forth below:

- "Equitable apportionment is the doctrine of federal common law that governs disputes between states concerning their rights to use the water of an interstate stream."[202]
- Equitable apportionment requires a "delicate adjustment of interests"[203] considering all relevant factors including:
    - the physical and climatic conditions;
    - the consumptive use within the different sections of the river and the return flow;
    - the extent of established uses;
    - the availability of storage water;
    - the effect of wasteful uses;
    - damage to uses in one state compared to benefits in another if limitations are placed on the former; and
    - the efficiencies of different uses.[204]
- When the states involved recognize the doctrine of prior appropriation, "priority becomes the 'guiding principle' in an allocation between competing states."[205]
- "[T]he equities of supporting the protection of established, senior uses are substantial, it is also appropriate to consider…conservation measures available to both states and the balance of harm to benefit."[206]

- The "doctrine of equitable apportionment clearly extends to a state's claim to divert water for future uses."[207]

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[200] *Vermejo II,* 467 U.S. 310.
[201] *Vermejo I,* 459 U.S. at 184 citing *Wyoming v. Colorado,* 259 U.S. 419 (1922).
[202] *Id.* at 183 (citations omitted).
[203] *Id.* at 183.
[204] *Id.* (citations omitted).
[205] *Id*.
[206] *Id.*at 188.
[207] *Id.* at 190.

- "[E]quitable apportionment will protect only those rights to water that are 'reasonably acquired and applied.'"[208] It requires not only the "reasonably efficient use of water" but it also imposes "an affirmative duty to take reasonable steps to conserve and augment the water supply of an interstate stream."[209]

The final factor makes clear the relationship between equitable apportionment and reasonable use in that the Court states that only those uses that are reasonably acquired and applied will be protected. This is an interesting concept in this context given that the New Mexico courts had previously adjudicated this stream requiring a determination that all uses are lawful. Examining the range of principles articulated by the Court it is difficult to discern a standard by which an equitable apportionment may be made.

Reasonable use

In *Vermejo I* the Court determined that existing uses in New Mexico could be reduced to accommodate new uses in Colorado, an equitable apportionment. The Court used the standard of reasonableness to determine the available supply from which an apportionment may be made without causing legal harm. In other words, the Court determined that a wasteful or unreasonable use is not protected under an interstate theory of priority of rights or a theory of equitable apportionment.

The following are principles articulated by the Court regarding reasonable use or its corollary, unreasonable or wasteful use:

- "The question here is not what one state should do for the other, but how each should exercise her relative rights in the waters of this interstates stream…. Both states recognize that conservation within practicable limits is essential in order that needless waste may be prevented and the largest feasible use may be secured."[210]

[208] *Id.* at 184 (citations omitted).
[209] *Id.* at 185.
[210] *Id.*

- "[I]t is…appropriate to consider the extent to which reasonable conservation measures by [one state] might offset the proposed diversion [in another state] and thereby minimize any injury to …users."[211]
- "Especially in those Western states where water is scarce, '[t]here must be no waste … of the 'treasure' of a river…. Only diligence and good faith will keep the privilege alive. Thus, wasteful or inefficient uses will not be protected."[212]
- "In calculating the dependable supply we (the Court) placed on each state the duty to employ 'financially and physically feasible' measures 'adapted to *conserving and equalizing* the natural flow.'"[213] (emphasis in original)
- Each state has a "duty to exercise her right reasonably and in a manner calculated to conserve the common supply."[214]
- "What is reasonable…does not admit of ready definition, being dependent upon the particular facts and circumstances of each case."[215]
- New Mexico did not act reasonably to take the actions necessary to detect waste and administer the Vermejo River in a reasonable manner. The following are listed as examples; the river does not have a Water Master, water use is not measured, there is not monitoring of use, the State Engineer lacks the staff to detect unadjudicated and unauthorized uses, the state had not installed gauges at the state line or assisted in the maintenance of gauges installed by Colorado nor did New Mexico administer the decreed rights under the Vermejo Decree.[216]
- A finding that a use is unreasonable requires more than a showing that it is not efficient.
- The Court will not permit unreasonable waste, but this must be established by clear and convincing evidence and may only be determined upon a comparison of uses in both states.

One commentator bemoans this last point indicating that the high standard of proof established in the *Vermejo* cases is the demise of equitable apportionment.[217] However, a standard of clear and convincing evidence is necessary in these circumstances not only for the reasons set forth by the court but because of the inherent nature of the controversy. Colorado asked the Special Master and the Court to manage the water resource from the top-down, to substituting itself as Water Master on the stream replacing the states.

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[211] *Id.* at 186.
[212] *Id.* at 184 *quoting* Washington v. Oregon, 297 U.S. 517, 527 (1936).
[213] *Vermejo I,* 459 U.S. at 185.
[214] *Id.* at 186
[215] *Id.* at 191 (Justice O'Connor concurrence)
[216] *Id.* at 332 (Justice Stevens dissent)
[217] George William Sherk, *Equitable Apportionment After Vermejo: The Demise of a Doctrine,* 29 NATURAL RES. J. 565 (1989).

The discussion of a standard of reasonableness is difficult to apply. This case took evidence on individual water uses, proposed water uses and then attempted to balance the relative importance of each. The Court, at the behest of a neighboring state, imposed standard of reasonableness on local water users in order to change a legal entitlement to water. This is disruptive to the stability provided by local water law. However, the law of equitable apportionment requires this to be done in some instances. The higher standard of proof is the balance between intrusion into state sovereignty and local property rights and the equitable apportionment of interstate watercourses.

In *Vermejo I* and *Vermejo II*, the Court held that Colorado must prove the particular conservation measures that are reasonable for New Mexico to make to reduce demand for water. Colorado failed to do so. The Court also required proof that the proposed uses in Colorado which meet the same standard of reasonableness. Colorado failed to prove this as well. For these reasons, the Court ruled in favor of New Mexico.

Conclusion

Determining equitable apportionment and reasonable use requires an examination of water use that many states will find intrusive. In *Vermejo I* and *Vermejo II* Colorado alleged unreasonable use by New Mexico and New Mexico countered that the proposed uses in Colorado must be reasonable as well. A finding of unreasonable use would "free-up" water within an over-allocated stream making it available to new uses. The determination whether a given use is reasonable or if the local laws and the administration of local water laws promotes reasonable use is difficult to determine and requires a fact intensive inquiry. The Vermejo River cases demonstrate the potential to use a standard of reasonableness to provide flexibility in the management of transboundary waters.

As discussed in Chapter One, the laws for the allocation of water develop to address local resource conditions and policy objectives. The evaluation of local uses with an interstate standard of reasonableness may result in a different determination of reasonableness than is made based on local law.[218]

[218] *See also,* Hinderlider v. La Plata River & Cherry Creek Ditch Co., 304 U.S. 92 (1938) for a discussion of the conflict between local water rights and deliveries under the requirements of an interstate compact.

Chapter 4 Water Laws: Entitlements, Rights, Duties and Privileges

Chapter One discussed selected examples of local water laws which developed from the bottom up to serve local needs. Chapter Two examined the principles of international water law discerned from state practice and codified by the International Law Commission in what became the 1997 UN Convention; water law from the top-down. The Vermejo River example, discussed in Chapter 3, lets us examine the relationships among local water laws, in this case prior appropriation and *acequias,* and the relationship between local water laws, principles of equitable apportionment among states of the United States and the principles of reasonable use. This Chapter examines the legal basis of water allocation and the different meanings of "water rights," the entitlements, rights, duties and privileges that permit use of a watercourse. The classic work *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*[219] by Guido Calabresi and A. Douglas Melamed provides an economics and the law perspective of different water laws. The classic articles, *Some Fundamental Legal conceptions as Applied in Judicial Reasoning*[220] and *Fundamental Legal Conceptions as Applied in Judicial Reasoning*[221] by Wesley Newcomb Hohfeld, provide the basis for a tautological discussion of "rights" to water. The reasoning from these articles is applied to local and international water laws to highlight conceptual differences.

An international watercourse flows through multiple communities, regions and states. Each user looks up the chain of vertical legal pluralism to determine the controlling water laws. These may include a local ditch users association, community rules, provincial or regional laws,

[219] 85 HARV. L. REV. 1089 (1972).
[220] 23 YALE L. J. 16 (1913).
[221] 26 YALE L. J. 710 (1916), *see* Curtis Nyquist, *Teaching Wesley Hohfeld's Theory of Legal Relations,* 52 J. LEGAL EDUC. 238 (2002) for a discussion of the continued relevance with these works by Hohfeld to legal understanding.

interstate apportionments and international agreements. At each of these levels similar terminology of "water law," "rights to water" and "water rights" is used but the underlying legal concepts are different. At one level a "water right" is based on community participation with shared benefits and burdens as in an *acequia.* At another level a "water right" is a commodity that is quantified, bought and sold as in a prior appropriation system or the spring allocations in Morocco. Absent a watercourse agreement, a "water right" at the international level is a "right" to an equitable share of the watercourse that is indeterminate and, in some instances, undevelopable without agreement among all riparians.[222]

Negotiations for watercourse agreements involving multiple states include a wide range of state and local water laws. This Chapter uses of the work of Calabresi and Melamed and that of Hohfeld to illustrate that a "water right" does not mean the same thing to all.

Entitlements: Calabresi and Melamed

> The first issue which must be face by any legal system is one we call the problem of 'entitlement.' Whenever a state is presented with the conflicting interests of two or more people, or two or more groups of people, it must decide which side to favor. Absent such a decision, access to goods, services, and life itself will be decided on the basis of 'might makes right'—whoever is stronger or shrewder will win.[223]

This is the foundation of the law and economics analysis by Calabresi and Melamed. It is the decision to enforce certain "rights," to favor one side over another in a dispute, which protects an entitlement.[224] Property rules, liability rules and principles of inalienability are used to enforce entitlements. A brief examination of these rules in relation to water illustrates differences in water laws.

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[222] *See Danube Case supra* note 98 and World Bank Operational Policy 7.50 available at http://go.worldbank.org/NEYC01UF60

[223] Calabresi & Melamed *supra* note 2 at 1090.

[224] *Id.* at 1089-1091.

A government may fix entitlements based on economic efficiencies, distributional goals or what Calabresi and Melamed call "other justice reasons." The entitlement to pollute or the entitlement to be free from pollution is a policy decision of the society served by that government. The government may conduct a similar analysis to decide whether to permit water to be diverted for an irrigation project. The decision will serve a policy of the government and the government is assured that the benefits will inure to the society because the legal system will support the continuation of the use that is favored by an entitlement, in this case irrigation.

> "Society can, for instance, give an entitlement away free and then, by paying the holders of the entitlement to limit their use of it, protect those who are injured by the free entitlement. Conversely, it can allow people to do a given thing only if they buy the right from the government."[225]

The laws of prior appropriation protect water use with property rules. The water is free to those who first construct the works and put it to beneficial use. The water right is quantified and in most jurisdictions may be transferred and sold. In the example above, the irrigator has a quantified water right which, given a limited supply, is protected by legal rules from interference by later appropriators.

Water use under riparian laws is protected by liability rules. The reasonable use of water on one parcel of riparian land is protected against unreasonable interference from other riparians. Reasonableness and liability for unreasonable use are determined using the Restatement factors which require comparing the disputed uses.[226]

The principles of international water law do not fit these rule sets. Each state riparian to an international watercourse has the right to share in the equitable and reasonable benefits derived from the resource. This is based on the sovereign equality of states which is crystallized

[225] Calabresi & Melamed *supra* note 2 at 1099.
[226] *See* Restatement discussion at notes _____.

as customary international law and is codified in the UN Charter.[227] This principle is incorporated in international water law through the provisions of the 1997 UN Convention. Article 4 paragraph 1 provides that "[e]very watercourse State is entitled to participate in the negotiation of and to become a party to any watercourse agreement that applies to the entire international watercourse, as well as to participate in any relevant consultations."[228] The 1997 UN Convention states explicitly that "[w]atercourse States shall cooperate on the basis of sovereign equality, territorial integrity, mutual benefit and good faith in order to attain optimal utilization and adequate protection of an international watercourse."[229] The determination of property rules or liability rules for an international watercourse is a matter for negotiation among watercourse states.

Water use for vital human needs and a human right to water are gaining acceptance as entitlements which may be inalienable. However, the international society of states has not developed enforcement mechanisms and an individual entitlement to water remains uncertain.[230]

Article 7 of the 1997 UN Convention, the prevention of significant harm, is a rule of liability. Article 7 is an obligation to prevent significant harm to other watercourse states. Article 7 includes a mechanism to enforce liability for significant harm. It provides:

> 1. Watercourse States shall, in utilizing an international watercourse in their territories, take all appropriate measures to prevent the causing of significant harm to other watercourse States.
>
> 2. Where significant harm nevertheless is caused to another watercourse State, the States whose use causes such harm shall, in the absence of agreement to such use, take all appropriate measures, having due regard for the provisions of articles 5 and 6, in

[227] U.N. CHARTER, art. 2 par. 1.
[228] 1997 UN Convention *supra* note 1 at Art. 4 par. 1.
[229] *Id.* at Art. 8 par. 1.
[230] SALMAN M. A. SALMAN & SIOBHÁNMCINERNEY-LANKFORD, THE HUMAN RIGHT TO WATER, LEGAL AND POLICY DIMENSIONS, (2004).

consultation with the affected State, to eliminate or mitigate such harm and, where appropriate, to discuss the question of compensation.[231]

It can be said that within international water law there is an entitlement to be free from significant harm caused by another state's utilization of the watercourse. This is based on the above provisions of Article 7 of the 1997 UN Convention and the customary international law principle of *sic utere tuo ut alienum non laedas.*[232] The ILC Commentary to Article 7 focuses on harm from pollution and contamination. It is not clear if Article 7 applies to harm caused by depletion of water by other uses. The ICJ was presented with this question in the *Danube Case* and used Article 5, equitable and reasonable utilization, as the basis of their decision. The Court determined that temporarily diverting 80 to 90 percent of the flow "deprived Hungary of its right to an equitable and reasonable share of the natural resources of the Danube."[233]

Is there a state entitlement to particular uses of water or quantified amounts of water that are enforceable within an international water law system of property rules and liability rules? "According to the doctrine of equitable utilization, each state has a legally protected interest in an equitable share of the uses and benefits of an international watercourse."[234] In the event of a conflict, the conflicting uses are compared using equitable factors. While each state is "entitled" to use the watercourse, the following section examines whether the right to an equitable and reasonable share is an "entitlement" that is protected by legal rules.

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[231] *Id. at* Art. 7. *Cf* The Law of Transboundary Aquifers Art. 6, A/Res/63/124 which does not include the provision that if harm does result "to discuss the question of compensation" that is contained in Art. 7 of the 1997 UN Convention.

[232] Loosely translated to mean "so use your property as not to harm that of another." MCCAFFREY *supra* note 94, 133.

[233] *See Danube Case supra* note 98, par. 85-86; MCCAFFREY *supra* note 94, 424-425.

[234] MCCAFFREY *supra* note 94, 388-389.

Comparative Standard

One state analyzes whether to utilize an international watercourse by determining the needs within its territory. The determination of whether water and water works to meet those needs is an equitable and reasonable utilization may only be made by examining e the uses made by other riparian states. This is a comparative analysis in which the factors for comparison are not within the control of the government wanting to initiate a new use. Assuming the new use is equitable and reasonable at the time it is initiated, use does not necessarily mature into an entitlement enforceable with property rules, liability rules or principles of inalienability. The use remains subject to diminishment by what may be determined to be more equitable or more reasonable uses in other states. This creates risks for a state proposing a watercourse development that, absent a watercourse agreement, remain throughout the life of the project.

The equitable and reasonable utilization framework for the 1997 UN Convention is valuable in part because it is flexible enough to apply to all states and all watercourses throughout the world.[235] It establishes that each state has the right to share in the watercourse and diminishes the influence of watercourse "might" based either on economic or military power or on the relative location of the state on the watercourse. However, it is this flexibility that makes development based on the rule of equitable and reasonable utilization risky. There are few, if any, watercourses within the world that contain sufficient water to accommodate all planned development. If the watercourse accommodates new development today, in time it will no longer contain sufficient water for additional uses. At any given time during planning, financing, construction or operation of watercourse works the equities along the watercourse may change and development in one state may be foreclosed by development within another

[235] *Id.* at 387-388 citing to Colorado v. New Mexico, 459 U.S. 176, 183 (1982) (*Vermejo I).*

state. This hampers investment in development requiring a water supply that remains available, predictable and ascertainable throughout the life of the development.[236]

Water use in the eastern states of the United States is based on riparian law. The quantification of a riparian use is governed by the rule of reasonableness which compares uses using similar factors to those used to determine equitable and reasonable utilization in international law.[237] In the latter half of the 20th century consumptive water use increased and riparian law did not provide the security needed for new water dependant development. The leading water scholar at that time described the problem as follows:

> "A major criticism of the system concerns the element of uncertainty associated with the reasonable use of water for nondomestic purposes. Because the reasonableness of each use is determined by the needs of other riparians, unforeseen conditions may arise when others commence or enlarge uses despite long nonuse of their rights. A further uncertainty exists in those states where a riparian neither making nor intending to make use of water can enjoin an existing use as unreasonable with regard to his right."[238]

Reasonableness is measured "either by the lack of damage to others or by the relative insignificance of the damage compared to the value of the use."[239] Equitable utilization may only be ascertained by comparing a use in one state to uses in all other states on the watercourse. Both equitable and reasonable are *post hoc* determinations. On a developed watercourse changes in watercourse conditions and new uses create new risks to the existing uses as each of them is measured against the new conditions.

The combination of legal and factual uncertainty[240] impairs the security needed to invest in water intensive development. This is particularly acute within a basin subject to natural

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[236] These risks are in addition to the natural variability of the resource.
[237] See text accompanying notes___.
[238] Frank J. Trelease, *A Model Water Code, the Wise Administrator and the Goddam Bureaucrat,* 14 NAT. RESOURCES J. 207, 208 (1974).
[239] Frank J. Trelease, *A Model State Water Code for River Basin Development,* 22 LAW & CONTEMP. PROBS. 301, 304 (1957) *citing* the RESTATEMENT OF TORTS 2ND §§852-854 (1939).
[240] *Id.* at 307.

fluctuations in flow. "What might be a reasonable [or equitable] use in good water years may become highly unreasonable in times of drought, and some riparians may, thus, lose their right temporarily."[241] Physical uncertainties may be overcome to a limited extent by storage, but the construction of storage facilities requires cooperation among the watercourse states to avoid having the impoundment of flow become a violation of the equitable and reasonable standard.[242]

It may be impossible to make a comparative analysis. Each state needs the data on natural conditions (flow, precipitation, climate, etc) and use within each other state to make the necessary comparisons. Water security necessary for a state to serve its own domestic needs is not possible without this information.[243] The security of a water entitlement while not provided by the principles of international water law alone may be acquired through agreements among co-riparians. The principles of equitable and reasonable utilization are better applied as a standard for negotiation than a basis for establishing a water entitlement. This is discussed further in Part II.

Rights, Duties and Privileges: Hohfeld

Local water laws based in property describe water use in terms of water *rights*. This section explores the law of equitable and reasonable utilization as a *right* to water. Professor Wesley Newcomb Hohfeld studied and developed the legal language of *rights.*[244] His scholarship and definitions of legal relationships, though published near the turn of the twentieth

[241] *Id.* at 308.
[242] *Danube Case supra* note 98, par. 155(1)(B & C).
[243] *See* 1997 UN Convention Art. 9, regular exchange of data and information.
[244] Wesley Newcomb Hohfeld, *Some Fundamental Legal conceptions as Applied in Judicial Reasoning,* 23 YALE L. J. 16 (1913); *Fundamental Legal conceptions as Applied in Judicial Reasoning,* 26 YALE L.J. 710 (1916).

century, remain a standard of jurisprudential thought today.[245] This discussion focuses on the Hohfeld chart of jural correlatives: right/duty and privilege/no-right.[246]

Looking at international water law using the Hohfeldian system of rights and duties highlights the distinctions between a property based water law system such as prior appropriations and those based on an equitable share of the resource. Water within an international watercourse is not *owned* by any one state along its course nor may one state assert control over the watercourse to the exclusion of other states.[247] The watercourse is a resource shared by all watercourse states.[248] Hohfeld defines the right to share in a common resource as a privilege. The Hohfeldian distinction between a right and a privileges is described by Singer as follows:

> 'Rights' are claims, enforceable by state power, that others act in a certain manner in relation to the right holder. 'Privileges' are permissions to act in a certain manner without being liable for damages to others and without others being able to summon state power to prevent those acts.'[249]

Singer describes the importance of the Hohfeld correlatives and opposites as follows:

> The major contribution of Hohfeld's opposites was to make it plain that to the extent others have legal liberties, one has no legal rights. Liberties are not by definition limited to the extent necessary to prevent damage to others, as the *sic utere* doctrine misleadingly implied. Legally protected interests are not granted absolute protection, as the concept of protected rights had misleadingly implied. The *sic utere* doctrine had the ideological purpose of reassuring people that the exercise of legal liberties did not threaten their security. Hohfeld's concept of opposites was ideologically designed to demonstrate that

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[245] *See* Joseph William Singer PROPERTY LAW: RULES, POLICIES AND PRACTICES 4th ed. 2006, 198-202 a standard property law textbook in use today (quoting extensively from Arthur Corbin *Jural Relations and their Classification* 30 YALE L. J. 226, 226-229 (1921)) and Curtis Nyquist *Teaching Wesley Hohfeld's Theory of Legal Relations* 52 J. LEGAL EDUC. 238 (2002) among others.

[246] Hohfeld 1916 *supra* note 239, 710.

[247] The theories of absolute territorial sovereignty and absolute territorial integrity have been repudiated by state practice and the jurisprudence of the United States Supreme Court. *See generally* MCCAFFREY *supra* note 94, Chs. 4-5.

[248] 1997 UN Convention Art. 2(c) defines a watercourse state, Art. 4, "Every watercourse State is entitled to participate in the negotiation of and to become a party to any watercourse agreement, and Arts. 5-6 regarding equitable utilization.

[249] Joseph William Singer, *The Legal Rights Debate in Analytical Jurisprudence from Bentham to Hohfeld,* 1982 WIS. L. REV. 975, 986-987 (1982).

> to the extent individuals have freedom of action, *others have no security*. The modern ideological message was thus completely the reverse of the classical message.
>
> It is not true that a legal right has been invaded merely because one has been injured **by** another. It is not true that all legally protected interests are protected to the same extent. It is not true that legal liberties are always accompanied **by** duties on others not to act in ways that interfere with the permitted acts.[250]

Building on an example used by Hohfeld "if X has a right against Y that he shall stay off the former's land, the correlative (and equivalent) is that Y is under a duty toward X to stay off the place."[251] Under a legal system of "rights" such as those under prior appropriation we can say that if a watercourse has 1000 acre feet of flow and X has a right to use 1000 acre feet of water from the river. "[T]he correlative (and equivalent) is that Y is under a duty toward X" to not use water from the river. Depending on the extent of the watercourse, there may be hundreds or thousands of Xs. Rights are allocated to Xs until the watercourse is fully appropriated at which time everyone else is a Y with a duty not to use water.

Under riparian law and the international system of equitable and reasonable use, Y is NOT under a duty toward X to not use water from the river. Each X and each Y hold the same right to an equitable share. Hohfeld classifies the legal relationship between X and Y as mutual privileges without corresponding duties. Neither X nor Y has a duty not to use the water and neither X nor Y has a claim against the other for interference unless the use is unreasonable or inequitable.[252] Each state has the *privilege* to utilize the shared resource subject only to the *privileges* held by other states. A *privilege* is described as a liberty or freedom and does not have a corresponding duty of non-interference. One state does not have a superior claim to the

[250] *Id.* at 1057.
[251] Hohfeld 1913 *supra* note 239, 32.
[252] *Id.* at 33-35.

use of the watercourse over any other states. Each riparian exercises the privilege so as not to violate the other privileges. The example used by Hohfeld illustrates this concept.

> "Thus it is said that a man has a perfect right to fire off a gun, when all that was meant, apparently, was that a man has a *freedom* or *liberty* to fire off a gun, so long as he does not violate or infringe any one's rights in doing so, which is a very different thing from a right, the violation or disturbance of which can be remedied or prevented by legal process."[253]

Each state along an international watercourse has the *freedom* or *liberty* to utilize that watercourse in an equitable and reasonable manner "so long as [the state] does not violate or infringe any [other state's] rights in doing so."[254] No use made by State A enjoys a *right* which if disturbed by utilization of the watercourse by State B gives rise to a legal remedy unless State B exceeds the equitable and reasonable limitations of its *privilege*. The use by State A is not a *right* to water with the correlative duty imposed on State B to not interfere. The correlative to a *privilege* is *no-right*.[255]

For example, assume A irrigates 10 acres of hay which is sold as cattle feed. If A has a water right in a jurisdiction with the law of prior appropriation that water right includes the right to have water delivered to A's point of diversion at a scheduled time in a quantified amount. A has the right to use the water for beneficial, non-wasteful, purposes on A's land. A has a claim against all others with junior priorities who might diminish his full water right. A's water right is "good" as against all others with a later priority date who have the correlative duty to not interfere with A's use.

Assume B has a water right with a later priority date for municipal supply for a remote community. B has a right to divert water at a scheduled time in a quantified amount for basic human needs and B has a claim against all others with later priority dates who interfere with his

[253] *Id.* at 42.
[254] *Id.*
[255] Hohfeld 1916 *supra* note 239, 710.

right. If conditions are such that the watercourse has insufficient supply to satisfy A and B, B cannot share A's water right. B may not use B's water right if it interferes with A's water right no matter the purpose for the use or the location on the river. B has a duty to not interfere with A's use. B's use for vital human needs does not give B a superior claim to a limited supply.[256]

Equitable interests in water based on an apportionment or share or those based on reasonable use involve a different bundle of legal rights. Water is a shared resource. Using the example above, under riparian law if A and B meet the criteria for obtaining the right to use the water, *i.e.* riparian land ownership and reasonable use, each share the resource. If conditions are such that there is insufficient supply to satisfy both the reasonable use of A for irrigation and of B for domestic supply, A does not have a claim against B to stop a reasonable use of water and B does not have a claim against A. A third party examining the factors for reasonableness determines which use is the more reasonable or if both are equal, reduces both.

Assuming the legal relationships among water users may be used to inform relations among states, the legal principles of equitable and reasonable utilization of an international watercourse create in each riparian state an Hohfeldian *privilege* to share in the resource that is no less and no greater than the privilege of any other state, defensible against inequitable and unreasonable uses. This is consistent with the international legal principle of equality of rights among states.[257]

Prevention of significant harm

The obligation to prevent significant harm is codified in Article 7 of the 1997 UN Convention. As previously discussed, Article 7 is based on the customary international law

[256] In reality this is a very complex process with market transfers, land fallowing and use of alternative supplies.
[257] "The Purposes of the United Nations are…To develop friendly relations among nations based on respect for the principle of equal rights…." U.N. CHARTER, art. 2, par. 1.

principle of *sic utere tuo ut alienum non laedas.*[258] This principle is important to completing the rights-duties analysis.

When Article 7 is a factor in the determination of equitable and reasonable utilization[259] it is a limitation on the privilege to utilize the watercourse. Returning to the nomenclature of Hohfeld, Article 7 creates a duty to not cause significant harm with a correlative right to be free from significant harm. This is apparent when examining the entirety of Article 7. The negative duty is created in the first paragraph requiring states to take appropriate measures to prevent significant harm. The legal consequences of failure to do so are in the second paragraph requiring the state to eliminate or mitigate the harm or to provide compensation.

State A has a duty to prevent significant harm which may result from its utilization of a watercourse. The correlative right held by all other states is to be free from significant harm caused by utilization of the watercourse in State A. The rules for enforcement of this right are contained in the second paragraph of Article 7 of the 1997 UN Convention include a requirement for State A to mitigate or eliminate the harm, and for State A to "discuss the question of compensation."[260] However, no state has the right to be completely free from all harm resulting from the utilization of the watercourse because each State has the privilege to utilize the watercourse and that utilization may result in some harm.

Conclusion

A vertical legal pluralism exists for the allocation and use of an international watercourse. Those people versed in international law or riparian law are familiar with the comparative concepts of equitable utilization and reasonable use. Those more familiar with private property

[258] MCCAFFREY *supra* note 94, 133.
[259] MCCAFFREY *supra* note 94, 436.
[260] 1997 UN Convention Art. 7(2).

allocations of water rights are not as familiar with the factors for determining equitable and reasonable and with the uncertainty of the water allocations under comparative water laws.

"Water rights" or "rights to water" are varied and complex. Equitable utilization among basin states is based on the reasonable use within each state. What is an equitable use and a reasonable use requires a comparison with all other uses in relation to the natural conditions of the resource. This is complicated further by the different legal foundations for water law and the vertical plurality of such laws.

The framework of entitlements as developed by Calabresi and Melamed and the terminology of "rights" discussed by Hohfeld help illuminate the differences in water laws. However, precision of language and a common understanding of legal relationships will foster better communication about utilization of a watercourse bottom-to-top and top-to-bottom.

Conclusion to Part I

Part I began with a quote regarding the need for legal systems to establish entitlements, the mechanism whereby the law may resolve disputes by favoring one side over another.[261] Using *Vermejo I* and *Vermejo II*, let us take stock of that idea.

Local water laws develop from the bottom up to match water resources with the needs of the community. Local laws often create entitlements, whether this is done on a priority system as is the law of Colorado and New Mexico or the springs in Morocco. These entitlements impose a duty of non-interference on all others and are protected and enforced through local courts or other cultural norms. The stability provided by entitlements fosters development.

An international or interstate watercourse is governed by laws that establish the rules for sharing the resource among multiple jurisdictions. These water resources are equitably divided in a top-down system. The Supreme Court of the United States developed the common law principle of equitable apportionment. The international legal system developed the customary law of equitable utilization which is "born of the US Supreme Court's decisions in interstate apportionment cases…."[262] These principles provide each watercourse state the equal privilege to utilize the common resource. As was discussed in relation to the Hohfeld paradigm of rights and duties, no state has the duty to refrain from utilizing the watercourse, each has the privilege which must be exercised within the parameters of reasonable use and the prevention of significant harm to other watercourse states.

Vermejo I and *Vermejo II* stand for the principle that an equitable apportionment of a watercourse includes limiting existing uses in one state for the benefit of another. Water users with valid entitlements to water based on the local law in one jurisdiction may lose that

[261] Calabresi and Melamed, supra note 5 at 1090.
[262] MCCAFFREY *supra* note 94,384.

entitlement to users within another jurisdiction[263] based on a comparison and balancing of the equitable factors and the comparative reasonableness of the uses.

The second part of the law of international and interstate watercourses is that of reasonable use. This chapter demonstrated that reasonable use is a principle of international law contained in the 1997 UN Convention and part of the principle of equitable apportionment as that doctrine has developed by the United States Supreme Court and as applied in the *Vermejo* cases. The standard of reasonable use may supersede local laws on an international or interstate watercourse. In the *Vermejo* cases the Supreme Court examined local delivery canals, local management by the user, and the state management of the watercourse to determine if the uses within New Mexico were reasonable. The Court also required a showing from Colorado that its planned future use would also be reasonable, and the case by Colorado for an equitable apportionment of the Vermejo River failed in part because of a lack of clear and convincing evidence regarding the reasonableness of the planned future uses in Colorado.

The law of equitable apportionment and equitable utilization may defeat an entitlement to water based on local law, however, these principles alone do not create entitlements. Use from a watercourse that is governed by the comparative standards of equity and reasonableness is not secure from claims from other states whether these occur over time or are reevaluated with each new demand on the watercourse. State development utilizing an international or interstate watercourse is a balancing of risks. The State may attempt to control those risks through assertion of "might" which may include political, economic or military intimidation or the assertion of discredited legal theories based on absolute territorial sovereignty or absolute territorial integrity which are discussed in Part II. Or, a state may control its risks by negotiating

[263] *See generally* Kansas v. Colorado, 185 U.S. 125 (1902).

watercourse agreements that take into consideration the needs of each state and the ecological and environmental preservation of the watercourse.

Societies depend on reliable and legally secure water supplies to serve the population and to foster and maintain economic development. Part II begins with a discussion of asymmetrical power on a watercourse. It then looks at two aspects of negotiating watercourse agreements, the role of law and the quantification of claims for future water security.

Part II
Negotiating Watercourse Entitlements

Part II
Negotiating Watercourse Entitlements

> [M]erely recognizing that states have equal rights usually does not, by itself, solve the problem of apportioning the uses and benefits of an interstate or international stream. It is only the starting point. But it is an essential starting point, because it means that no state has an inherently superior claim to the use of the watercourse.[264]

Prof. Trelease posits that water security consists of three aspects; physical certainty, legal certainty and tenure certainty. Physical certainty relates to the availability of water which may be improved with infrastructure and river works. Legal certainty provides predictability in the event of a conflict. Tenure certainty is crucial for investment in watercourse development. It is the "protection against the loss of the water right by the exercise of lawful acts by others."[265] Tenure certainty was lacking under the riparian laws of the United States and is a driving force for the negotiation of transboundary agreements. All states have equal rights to share the benefits of and from a transbouncary watercourse. As discussed in Chapter Two, the legal principles of equitable and reasonable utilization are comparative standards. Each use is evaluated against other uses. Therefore, tenure security requires all states to participate in watercourse negotiations.

Watercourse agreements may provide all three aspects of water security. States, as sovereigns, may grant or obtain rights and assume duties vis-à-vis other states by agreement. A use of an international watercourse that is recognized by the other watercourse states and that will remain secure during the life of a project may be established in a watercourse agreement.

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[264] MCCAFFREY *supra* note ___2007 at 391.
[265] Trelease 1957 *supra* note 1at 307 *citing* S.V. Ciriacy-Wantrup, *Concepts Used as Economic Criteria for a System of Water Rights,* 32 Land Econ. 295 (1956).

Watercourse agreements allocate water in any number of ways including volumetric quantification,[266] percentage of flow,[267] shared storage,[268] and priorities by sector.[269]

An allocation secured by a watercourse agreement creates a legal entitlement enforceable according to the terms of the agreement and allows each watercourse state to respond to its own preferences for water use subject to the equitable uses in other watercourse states.

Part I concluded that watercourse agreements are necessary to obtain and preserve water security within the international law of equitable and reasonable utilization. Watercourse negotiations are as complex and varied as the natural conditions of watercourses. This Part II explores two aspects of such negotiations; the role of law and a methodology that may be used by developing states to meaningfully participate in watercourse negotiations.

Chapter 5 begins the discussion of negotiations with a short explanation of three aspects of negotiations particular to watercourses; first, the subject matter of the negotiation is a natural system, second, existing intra-state allocations are controlled by national, regional and local laws and third, the relative location of states to each other and to the watercourse affect their power positions in negotiations.

Chapter 6 discusses using laws applicable to watercourse negotiations to define the bargaining zone.[270] The 1997 UN Convention and the principles recognized by the International Court of Justice as customary international law establish the box within which negotiations may

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[266] Colorado River Compact, signed November 24, 1922, Ariz, Cal., Colo. Nev., N.M., Ut., Wyo. The 1922 Compact was approved by Congress through the Boulder Canyon Project Act of 1928, 45 Stat. 1057 (1928) which provided that the 1922 Compact would enter into force upon the approval of 6 of the 7 basin states and by proclamation of the President. This occurred with the proclamation of President Hoover on June 25, 1929. The 1922 Compact is available at *www.usbr.gov/lc/region/pao/pdfiles/crcompct.pdf* .

[267] Upper Colorado River Basin Compact, 1948, Ariz., Colo., N.M., Ut., Wyo., 63 Stat. 31 (1949) *available at* www.usbr.gov/lc/region/pao/pdfiles/ucbsnact.pdf .

[268] Arkansas River Compact Dec. 14, 1948, 63 Stat. 145 (1949).

[269] Senegal River Water Charter 2002 *available at* http://faolex.fao.org/docs/pdf/mul71173.pdf.

[270] *See Omar M. Dajani, Shadow or Shade? The Roles of International Law in Palestinian-Israeli Peace Talks,* 32 YALE J. INT'L L. 61, 81 (2007).

occur.[271] The principles of sovereignty over natural resources, water for human needs and sustainable development are discussed as soft laws influencing state positions in negotiations. Chapter 6 also discusses the influence of the World Bank operational principles on watercourse negotiations. All of these legal mechanisms help to level the playing field and lessen the potential for domination by basin hegemons.

Chapter 7 discusses a negotiation methodology specific to watercourse negotiations based on the *Winters* doctrine of reserved rights from the United States. Developed states have an inherent advantage in watercourse negotiations in that they know their current water use and may more easily project their future demand. Developing states may not have a complete picture of present use or the more complicated calculations for projected future demand. Yet an agreement for the sharing an international watercourse once entered, is not easily altered.[272] Recognizing these circumstances Chapter 7 adapts the methodology used for presentation of water rights claims on behalf of Native American tribes in the courts of the United States to inform international negotiations.

Chapter Five: Watercourse Negotiations Are Different

Watercourse negotiations are different from other bilateral or multilateral negotiations in three significant ways. An international watercourse is a natural system about which all parties require a common understanding. It is a fluctuating system that changes seasonally and over time. Using the Colorado River as an example, the states meeting in 1922 to negotiate an interstate Compact had stream flow data at Lees Ferry for approximately 20 years indicating a

[271] *Id.*
[272] *Case concerning the Gabčíkovo-Nagymaros Project* (Hungary v.Slovakia) at par. 78-79, Sept. 25, 1997, 1997 ICJ 7, *hereinafter Danube Case.*

mean flow of 16.1 acre feet per year.[273] They entered a compact for the volumetric allocation of water totaling 15 million acre feet per year.[274] Recent paleontological tree ring studies indicate that the historic precipitation patterns examined during the negotiations of the 1922 Compact were unusually high. The historic average flow is in the range of 13 to 14.7 million acre feet.[275] This means that the average natural flow was not sufficient to meet the requirements for allocations to the states at the time they were made. Total flow of blue water run-off is part of the basic data required to negotiate a watercourse agreement. Information on groundwater storage and recharge, precipitation and rain fed water use are also crucial but may be unknowable given the technology and data collection at the time of negotiations.[276] Therefore, flexibility in the allocation and management of the hydraulic system is key to reaching agreement.

Watercourse negotiations are limited by, but not controlled by the facts on the ground. River works may provide storage of floodwaters and run-off during rainy seasons for release during agreed upon times for multiple purposes. Rivers may be channelized for navigation and flood protection. Multipurpose projects often provide flood control, irrigation water during dry seasons and hydropower production, increasing the benefits to all riparian states.

In addition to involving complex natural systems and possible construction of multipurpose works, international watercourses are utilized according to multiple layers of laws, customs, traditions and religious practices. The next section discusses legal pluralism in relation to watercourse negotiations.

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[273] NATIONAL ACADEMIES OF SCIENCES, COLORADO RIVER BASIN WATER MANAGEMENT: EVALUATION AND ADJUSTING TO HYDROCLIMATIC VARIABILITY 80 (2007).

[274] Colorado River Compact 1922.
[275] NAS *supra* note 109
[276] Historic watercourse data is used when available. However, hydrologists predict that even the best available historic data will not be an accurate indicator of future availability due to our changing climate. NAS *supra* note __, 80.

Legal Pluralism

> "Legal pluralism argues that understanding water rights needs to start from the local perspectives of those who use water, their daily experiences, the meanings through which they conceive of water and rights, and the options they have available for acquiring water and defending their access to this vital resource."[277]

Chapter one discussed the development of water law from the bottom up, (laws to determine water use that develop at the user level) and the development of transboundary and international water law from the top down (agreements among states that determine the allocation of water within large political boundaries). The local laws regulating use and the international agreements are the bookends, the bottom and top, of multiple layers of law that are the vertical legal pluralism of water law.

Legal pluralism is a term used by different theorists in different ways, all of which describe multiple laws governing a single situation or sector of law. International legal theorists discuss a horizontal pluralism in which a single conflict or situation is governed by multiple, often inconsistent, legal regimes.[278] Koskenniemi[279] discusses legal pluralism and constitutionalism as outcomes from the increasing fragmentation of international law. Absent an international legal hierarchy the increasing fragmentation of international law into subject matter sectors results in legal pluralism which is an acknowledgement of the situation and a tacit tolerance.[280] Twining[281] and Teubner[282] describe legal pluralism as the current fragmentation of

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[277] Ruth S. Meinzen-Dick & Bryan Randolph Bruns, *Negotiating Water Rights: Introduction 25, in* NEGOTIATING WATER RIGHTS (Bryan Randolph Bruns & Ruth S. Meinzen-Dick eds. 2000)

[278] *See* Koskenniemi, Twining, Teubner, *intra* note __.

[279] Marti Koskenniemi, *The Fate of Public International Law: Between Technique and Politics,* 70 Modern Law Review 1 (2007), *see also* Marti Koskenniemi, *Global Legal Pluralism: Multiple Regimes and Multiple Modes of Thought,* address at Harvard March 5, 2005 *available at* http://www.helsinki.fi/eci/Publications/MKPluralism-Harvard-05d%5B1%5D.pdf *accessed* April 19, 2007.

[280] Constitutionalism on the other hand seeks to establish a hierarchy. One example of which is dispute resolution in which the ICJ serves as an international appellate body with all other mechanisms established by treaty subsidiary to the World Court. *See Report of Stephen M. Schwebel, President of the International Court of Justice,* U.N. GAOR, 54th Sess., Agenda Item 13, at 3-4, U.N. Doc. A/54/PV.39 (1999) *for a discussion of constitutionalism theory of international law.*

law into sector regimes. These theorists are concerned with forum shopping for dispute resolution among the different dispute resolution mechanisms provided by different sectors of international law which may be applicable to a given dispute. It is often the fact that the sector selected to resolve the dispute will determine the outcome.[283] Legal pluralism acknowledges the existence of multiple regimes and unlike constitutionalism does not seek to impose a hierarchy.[284]

The most cited example of horizontal pluralism is a dispute between Ireland and the United Kingdom over the Sellafield nuclear enrichment plant. The dispute was presented under the Convention on the Law of the Sea to the UNCLOS tribunal. It was also presented by Ireland against Britain before the European Court of Justice under the laws of the European Union. In this dispute the President of the UN Law of the Sea Tribunal deferred to the European Court of Justice "in accord with the dictates of mutual respect and comity." Koskenniemi writes that this global "comity" or "regime-co-ordination" will need to develop to resemble the private law of conflicts.[285] This is not likely to occur, even with the urging of Judge Stephen Schwebel, former president for the International Court of Justice who advocates for the ICJ to serve as an appellate body in such situations.[286]

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[281] William Twining, *Diffusion of Law: A Global Perspective,* 1 J. Legal Pluralism & Unofficial L. 1 (2004), William Twining, *Social Science and Diffusion of Law,* 32 J.L. & Soc'Y 203 (2005), William Twining, *Diffusion and Globalization Discourse,* 47 Harv. Int'l L.J. 507 (2006).
[282] Andreas Fischer-Lescano & Gunther Teubner (Michelle Everson translator), *Regime-Collissions: The Vain Search for Legal Unity in the Fragmentation of Global Law,* 25 Mich. J. Int'l L. 999 (2004).
[283] William W. Burke-White uses the term "legal pluralism" in a more general way. He reconciles those that argue that the international legal system is becoming more fragmented with those that argue it is becoming more connected by saying that international lawyers should describe the emerging system as pluralist. *International Legal Pluralism in Diversity or Cocophony?: New Sources of Norms in International Law Symposium,* 25 Mich. J. Int'l L. 963 (2004).
[284] *See* Schwebel *supra* note 21.
[285] Koskenniemi 2007, *supra* note __, *15.*
[286] *See* Schwebel *supra* note 21.

Koskenniemi[287]and Burke-White[288]observe the development of a pluralism of regimes that exist along a horizontal plane. Any of the relevant regimes may be used to resolve an international dispute with equal authority.

> From this perspective, conflicts between, say, trade and human rights, economic development and the environment, scientific and political expertise can never really be settled because there is no meta-rationality that would allocate to each its respective place or hierarchical position. Instead of co-ordination from some higher level, there will be a series of more or less violent adoption of jurisdiction by one expert institution where the matter had previously been dealt with by another. No hierarchy is established, but the centre moves….Each rationality and expert system is involved in a hegemonic project: to make *my* rationality govern the whole—to make *my* preference, the structural bias of our institution, the general preference. From the UN and elsewhere, the experience is familiar that once one knows which institution will deal with an issue, one already will know how it is disposed of.[289]

Hydraulic systems are increasingly subject to horizontal legal pluralism with development of additional international environmental regimes and soft law statements from international conventions and declarations.[290] The 1997 UN Convention covers a broad scope of watercourses defined as "a system of surface waters and groundwaters constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus."[291] The ILC recently adopted on second reading a set of draft articles on "The Law of Transboundary Aquifers" the scope of which includes groundwaters that are within the scope of the 1997 UN Convention. This is significant given the addition of Article 3, Sovereignty of Aquifer States in the latter instrument. All waters within the scope of the 1997 UN Convention are governed by the principles of equitable and reasonable utilization. Draft Article 3 of the Law of Transboundary Aquifers provides that:

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[287] Koskenniemi 2007, *supra* note __
[288] William W. Burke-White, *International Legal Pluralism,* 25 MICH. J. INT'L L. 963 (2004).
[289] Koskenniemi 2007, *supra* note __,15.
[290] *See* UN/ECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes, March 17,1992 *available at* http://www.unece.org/env/water/.
[291] 1997 UN Convention, Art. 2(a).

> "Each aquifer State has sovereignty over the portion of a transboundary aquifer or aquifer system located within its territory. It shall exercise its sovereignty in accordance with international law and the present draft articles."[292]

The interjection of principles of sovereignty in relation to transboundary waters creates the potential for two regimes to produce two different results regarding utilization of the same waters.[293]

More importantly for the impact on current water negotiations is vertical legal pluralism which is a subject studied by social and anthropological legal theorists. Sally Engle Merry offers a general definition of legal pluralism as "a situation in which two or more legal systems coexist in the same social field."[294] "Classic" legal pluralism[295] studied the interaction between European systems of law imposed within colonies and the indigenous law. A "new legal pluralism"[296] examines the intersection of laws of multiple origins within a society.[297] The broader definition of law as normative forces in society associated with legal pluralism is criticized as re-defining "law" separate from the state or sovereign power.[298] However, it is apparent from the discussion in this paper that water is controlled, regulated, monitored and

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[292] *Report of International Law Commission,* ¶ 46-49, A/63/10 *available at* http://untreaty.un.org/ilc/reports/2008/2008 report.htm. The Draft Articles that appear at paragraph 53 of this Report will be referred to hereinafter as the "2008 Draft Articles."

[293] *See* Margaret J. Vick, *International Water Law and Sovereignty: A Discussion of The ILC Draft Articles on the Law of Transboundary Aquifers,*, 21Pac. McGeorge Global Bus. & Dev. L. J., 191 (2008) *for a detailed discussion*.

[294] Sally Engle Merry, *Legal Pluralism,* 22 LAW & SOC'Y REV. 869 (1988).

[295] *Id*. at 872.

[296] *Id*.

[297] "[R]esearch on legal pluralism began in the study of colonial societies in which an imperialist nation, equipped with a centralized and codified legal system, imposed this system on societies with far different legal systems, often unwritten and lacking formal structures for judging and punishing. This kind of legal pluralism is embedded in relations of unequal power. The concept has been expanded in recent years to describe legal relations in advanced industrial countries, but here, discussions of legal pluralism are quite different. The center on a rejection of the law-centered-ness of traditional studies of legal phenomena, arguing that not all law takes place in the courts. The concern is to document other forms of social regulation that draw on the symbols of the law, to a greater or lesser extent, but that operate in its shadows, its parking lots, and even down the street in mediation offices. Thus, in contexts in which the dominance of a central legal system is unambiguous, this thread of argument worries about missing hwat else is going on; the extent to which other forms of regulation outside law constitute law." *Id*. at 874.

[298] See *id.* at 875-879 and Franz von Benda-Backman, *Who's Afraid of Legal Pluralism?,* 47 J. LEGAL PLURALIMS & UNOFFICIAL LAW 37 (2002) for a general discussion of the debate over the concept of legal pluralism.

disputes are resolved at multiple levels which may or may not be within one state's hierarchical system of law.

Guillet applied the principles of legal pluralism to water rights in northwestern Spain, Meinzen-Dick and Nkonya applied the principles to water rights in Africa and Asia following the research in legal anthropology of H. L. Joep Spiertz in southeastern Asia. The legal anthropologist examines the normative system governing use of water at the local level and then steps back to examine what other normative systems are at work to allocate the same watercourse.

In addition to the multiplicity of laws and norms for a single watercourse the same law may be applied differently in different locations. Each *acequia* within northern New Mexico developed its own social structure for water allocations and for sharing the costs and decision making within the community. Spiertz documents that the *subaks* in Blahpane have the same normative institutions but their administration is different depending on the locale. "In other words, plurality of law should not only be seen in terms of different normative systems pertaining to one domain of social life, but also in the way in which one legal rule or one institution can manifest itself differently in different levels and contexts."[299]

These layers of the legal system are not necessarily consistent. The domestic law of each state determines the hierarchy however within a hierarchical system legal pluralism calls for a closer examination of compliance and non-compliance and by whom.[300] Local use may continue despite a transboundary agreement requiring curtailment in favor of delivery across a border. The local farmer may not know of the requirements in the transboundary agreement or may not

[299] H.L. Joep Spiertz, *Water Rights and Legal Pluralism: Some Basics of a Legal Anthropological Apporach,* 183 in NEGOTIATING WATER RIGHTS, Bryan Randolph Bruns & Ruth S. Meinzen-Dick eds. (2000).
[300] *See,* Hinderliter v. La Plata River & Cherry Creek Ditch Co., 304 U.S. 92 (1938) in which the courts of the United States determined that the allocation in an interstate compact limited the amount of water available to users based on local state law.

consider it binding on her when she is using the water in the same manner under the same legal right as always. Under these circumstances the question of compliance and non-compliance is not clear-cut. The water use by the farmer is in compliance with local law but the state may be in breach of its obligations under a transboundary agreement. The state must develop the capacity to control and curtail local use to meet its obligations under a transboundary agreement.

How does this affect transboundary negotiations? Negotiations occur at a level most likely to meet the needs of the parties negotiating.[301] A farmer negotiates for water with her neighbors or a local ditch authority; a large developer negotiates with the reservoir operators and regional government; a utility may negotiate with the state for construction of a hydroelectric power plant. But negotiations rarely jump a level whereby local farmers negotiate with other states. The farmers are more likely to pressure their representatives who negotiate with other states. Each state brings to negotiations its own individual box built by domestic laws and interests that confine or limit the options available to that state in transboundary negotiations.[302]

The Rio Gallinas basin in northern New Mexico in the southwestern United States includes *acequias* which have supplied water to local farms for centuries. When the supply of water in the basin did not meet all the new demands the state of New Mexico instituted an adjudication to determine the relative priorities of each user within the prior appropriation

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[301] Bryan Randolph Bruns & Ruth S. Meinzen-Dick, *Negotiating Water Rights,* in NEGOTIATING WATER RIGHTS, Bryan Randolph Bruns & Ruth S. Meinzen-Dick eds. (2000).

[302] Eyal Benvisiti discusses establishing local agreements for transboundary resources. SHARING TRANSBOUNDARY RESOURCES, INTERNATIONAL LAW AND OPTIMAL RESOURCE USE (2002) and essay, (Eyal Benvinisti, *Domestic Politics and International Resources: What Role for International Law,* 119, in THE ROLE OF LAW IN INTERNATIONAL POLITICS ESSAYS IN INTERNATIONAL RELATIONS AND INTERNATIONAL LAW, Michael Byer, ed. (2000). He argues for negotiating resource agreements, including water, at a local level to avoid the difficulties of heterogeneous influences that complicate or preclude state-to-state negotiations. His main example is a waste water treatment plant serving both Israeli and Palestinian communities. This type of local agreement may be effective for waste disposal or pollution prevention however this author maintains that it should not be used for apportionment of an international watercourse. This type of local agreement may be perceived as creating rights that only frustrates basin wide agreements that can foster optimal utilization. In fact, Benvenisti makes this very point that states "must abstain from assigning inalienable rights in shares of ICPR's …." Heterogeneity as described by Benvinisti is not unique to negotiations over resources and is not the same concept as legal pluralism.

system of state law in order to apply the first in time rule. Each irrigator and water user within the *acequia* was served with notice to establish the date of first use and proof of continuous use in order to establish a priority date and the non-abandonment of the water right. The *acequia* management through the *mayordomo* established that within the *acequia* the law of prior appropriation did not apply, that the water was shared equitably in times of shortage and the first-in-time rule did not apply. The land owners within the acequia also argue that the laws regarding abandonment of appropriative rights for non-use do not apply. The Rio Gallinas forms part of the headwaters and is tributary to the Pecos River. The Pecos River is subject to an interstate compact between New Mexico and Texas[303] one purpose of which is "to provide for the equitable division and apportionment of the use of the waters of the Pecos River."[304] The Pecos River is tributary to the Rio Grande. The confluence is in the limitrophe section forming the border between the United States and Mexico and subject to bilateral treaties.[305] All sections of these watercourses are fully appropriated.

The question becomes what law controls the use of water by the farmers in the Rio Gallinas basin? Within the constitutional system of the United States a hierarchy of laws exist and the resolution may be determined in court.

Through out the world use of water is governed from the bottom-up by local and provincial laws. Yet the use of an international watercourse vis-à-vis other states is determined at the top levels of government with the results implemented from the top down. Recognizing legal pluralism in international negotiations may have positive and negative effects on the negotiations. If the vertical pluralism of water law within a state is considered in international

[303] Pecos River Compact, NMSA §75-15-19
[304] *Id*. Art. 1
[305] Convention between the United States and Mexico Equitable Distribution of the Waters of the Rio Grande, May 21, 1906, Rectification of the Rio Grande, Feb. 1, 1933, Utilization of the Waters of the Colorado, Rio Grande and Tijuana Rivers and Protocol, Feb. 3, 1944.

negotiations those negotiations may be slowed considerably as local uses and constituent interests are assessed. Local laws may permit uses which will no longer be viable after an international water sharing agreement is reached. On the other hand, as will be discussed in Chapter 7, the assessment of local uses and the local laws that protect those uses are a valuable determination of equitable and reasonable utilization of the watercourse. If local laws and local uses are not considered, the political constituencies will be impacted upon implementation and at worst the agreement loses the legitimacy necessary to make it effective. Local water uses, if continued or expanded under local law will undermine the implementation of transboundary agreements.

As an example, the La Plata River in the states of Colorado and New Mexico is allocated by an interstate compact[306] which authorizes the respective State Engineers to adjust deliveries in times of shortage. When the Colorado state engineer cut off deliveries to farmers in Colorado they sued him for violating their water rights which were perfected and adjudicated through a state judicial proceeding. The constitution of the United States provides that the allocation contained in the inter-state compact which is approved by Congress is superior to state law which regulates local uses.[307] If this had not been the case, or if these facts were presented in an international setting involving states without clear hierarchies of law, the upstream farmers have the potential to defeat the purposes of the inter-state agreement.

Asymmetrical Power on a Watercourse

This section briefly discusses aspects of asymmetrical power unique to transboundary watercourses looking at some factors that contribute to hydro-hegemony.

[306] La Plata River Compact, November 27, 1922, http://www.ose.state.nm.us/isc_laPlata_river_compact.html .
[307] United States Constitution Art. VI clause 2.

The land to which a state is entitled, its territory, is defined by political borders, many of which were established by military power and alliances. International law now prohibits the acquisition of territory by force[308] and most territorial entitlements are secure.[309] International watercourses[310] are not limited by political borders. Water flows, it moves from the snowmelt or rain at the headwaters through multiple jurisdictions, through multiple uses, often returning to the stream bed or aquifer many times before reaching an outlet. The amount of water within a watercourse fluctuates with storm events, with seasonal changes and with climate changes. The water quality changes as the water passes through different geological structures, as it is used, and as waste and pollutants are added. Over time, even the location of the watercourse changes.

Power may be exerted in watercourse negotiations based on the relative location of one riparian state to another. Upstream states may assert physical control over downstream flow. Upstream dams, diversions and the discharge of pollutants determine the amount of water that is available for use in a downstream state. Downstream states fear depletion and contamination of the watercourse before it reaches their territory. However, downstream states are often the first to develop using the flatter and more temperate lower reaches of a watercourse to create economic superiority within the basin. The downstream state also may balance the upstream power with legal authority. The customary international legal principle *sic utere tuo ut alienum non laedas,*[311] on which the principle of prevention of significant harm codified in Article 7 of the 1997 UN Convention is based, allows the downstream state to limit use in an upstream state.

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[308] U.N. CHARTER ART. 2 (4).
[309] *See* J. L. BRIERLY, THE LAW OF NATIONS, AN INTRODUCTION TO THE INTERNATIONAL LAW OF PEACE CH IX (6th ed. 1963)at 413-432, IAN BROWNLIE, PRINCIPLES OF PUBLIC INTERNATIONAL LAW, CH 33 (6th ed. 2003)at Chapter 3 697-715
[310] An international watercourse is defined as "a system of surface waters and ground waters constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus; … parts of which are situated in different States. United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses, UN Doc. A/RES/51/869, May 21, 1997, 36 ILM 700 (1997)at Art. 2(a) and (b).
[311] *See*, 1997 UN Convention at Art. 7.

The downstream state may also object to upstream uses as inequitable or unreasonable. The *Danube Case* demonstrates that unilateral control by the upstream state of 80 - 90% of the flow for a short period of violated the principles of equitable and reasonable utilization in relation to the downstream state.[312]

The historic legal theories for the non-navigational utilization of an international watercourse reflect assertions of upstream and downstream power on a watercourse.[313] The theory of absolute territorial sovereignty, set forth in the opinion of United States Attorney General Judson Harmon during negotiations with Mexico over the Rio Grande,[314] provides that a state may use all the water within its territory without obligation to deliver water to downstream states. This legal theory was not followed by the United States. However, the power of an upstream location is used by Turkey on the Tigris and Euphrates rivers to develop the GAP project without meaningful consultation or agreement with the downstream states.[315]

The theory of absolute territorial integrity provides a position of "might" for a downstream state. This theory provides that a state has a right to receive all of the water within a watercourse undiminished in quantity or quality by upstream use.[316] This is an exaggerated extension of the principle of *sic utere tuo.*

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[312] *Danube Case supra* note ___ at ___.
[313] STEPHEN C. MCCAFFREY, THE LAW OF INTERNATIONAL WATERCOURSES (2007), Chapt. 5 at 111-170..
[314] So named after the United States Attorney General Judson Harmon who drafted a formal opinion asserting absolute territorial sovereignty as a legal basis for negotiations with Mexico over the Rio Grande. Judson Harmon, Attorney-General, to Richar Olney, Secretary of State, to 12 Dec. 1895, 21 Op. Att'y Gen. 274 (1895), reproduced in U.S. APPENDIX, p. 204.
[315] Officials from Turkey have been some of the most recent spokesmen for this policy in statements regarding development of the Southeast Anatolia Project, known as GAP. Officials stated that Turkey did not claim the oil resources in Syria or Iraq and had no intention of sharing the water resources from within its territory. *See* Benvenisti at 17 quoting from BBC report.
[316] McCaffrey 2007 *supra* note ___.

The United States Supreme Court characterizes arguments based on both absolute territorial sovereignty and absolute territorial integrity as "extreme positions."[317] Neither theory is viable in international law based on state practice.[318] The research by the ILC preparatory to the 1997 UN Convention and the ICJ decision in the *Danube Case* make clear that the law requires states to share the equitable and reasonable benefits of an international watercourse.

The factors for determining equitable and reasonable utilization give consideration to a states relative location on a watercourse[319] and to the different levels of development[320] without giving advantage to one factor to the disadvantage of another.[321] For example, in a typical watercourse downstream state B is more highly developed with a larger population, a larger economy and a larger military. Upstream state A includes the headwaters for the watercourse, is a more remote and mountainous region and is less developed. The interests of state B are in preserving the existing development and providing food and water for a growing population and economy. A theory of absolute territorial integrity provides the most water security. Absent this extreme position state A may focus negotiations on the following factors from the 1997 UN Convention:

> (c) The population dependent on the watercourse….
> (d) The effects of the use or uses of the watercourses in one watercourse State [upstream state A] on other watercourse States [downstream state B]
> (e) Existing and potential uses of the watercourse.[322]

The interests of upstream state A are in developing the potential of the watercourse for hydropower, irrigated agriculture and domestic supply for a growing population. A theory of absolute territorial sovereignty would permit state A to construct a multipurpose dam. However,

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[317] Kansas v. Colorado, 206 U.S. 46 (1907).
[318] MCCAFFREY 2007 *supra* note __, 112.
[319] 1997 U.N. Convention *supra* note __, Art. 6 (1)(a).
[320] *Id.* at Art. 6 (1) (b).
[321] *Id.* at Art. 6 (3).
[322] 1997 U.N. Convention *supra* note __, Art. 6 (1).

under the principles of international law as set forth in the 1997 UN Convention upstream state B may relay on Article 6(b) "[t]he social and economic needs of the watercourse States concerned" and gain support from the Helsinki Rules Article V(2)(b) which provides that the hydrology of the basin, "including in particular the contribution of water by each basin State" is a relevant factor to determine equitable and reasonable utilization.

The principles of equitable and reasonable utilization of an international watercourse and the obligation to prevent significant harm to other watercourse states deter the assertion of sovereign might over an international watercourse. However, remnants of each theory of absolute sovereignty remain in political posturing and therefore each theory informs the discussion of negotiations.

Conclusion

This chapter discussed unique negotiating circumstances related to watercourses, the variability of the natural conditions of the watercourse, the layers of existing laws governing its utilization, and the power positions of the parties based on their relative location on the watercourse. Within a state, the recognition of subsidiary laws governing utilization of the watercourse informs the negotiating positions as well as lays the foundation for implementation of a watercourse agreement. The physical characteristics of the watercourse may cause a shift in the relative political power positions of the parties to the negotiations depending on the location as an upstream or downstream state.

Transboundary watercourse agreements are political instruments. International agreements are negotiated by government officials and once concluded must be approved by legislative or parliamentary bodies to enter into force. The negotiators balance the interests and benefits with the other parties during negotiations while maintaining the domestic political and

development agenda sufficiently intact to obtain ratification. This complexity of interests is one reason current scholars are proposing "benefit sharing"[323] By enlarging the basket of items open for negotiation the parties are more likely to be able to create a win-win situation for all constituents.[324]

Benefit sharing and broadening the negotiations do little to limit the power that can be exercised by a hydro-hegemon. The next chapter discusses the role international law may play to support a process to better equalize the power positions in watercourse negotiations and provide legitimacy for local constituencies.

[323] Claudia W. Sadoff & David Grey, *Beyond the River, The Benefits of Cooperation on International Rivers,* 4 WATER POLICY 389 (2002).
[324] Claudia W. Sadoff & David Grey, *Cooperation on International Rivers: A Continuum for Securing and Sharing Benefits,* 30 WATER INTERNATIONAL 420 (2005).

Chapter Six: The Role of Law

> *A person trained in another discipline, an engineer, has postulated that, in fact, water laws have a relatively unimportant effect on development, that entrepreneurs initiate projects and engineers build them without much regard for the fears here discussed the need to reform of water laws].*
>
> *Perhaps the truth lies somewhere between. If poorly-designed laws do not impede all developments, how much do they impede? If development proceeds outside the law, to what extent is present law a trap waiting to be sprung on those who have invested in projects? How many projects are not built? The biggest builder and financier of water use projects, the federal government, has refused to act in the face of uncertain water titles….*[325]

Frank J. Trelease, the leading water law scholar of the 20th century poses these questions about the role of water law following his analysis of the prior appropriation and riparian systems in the United States in a time of maximum development.[326] While the policy promoting maximum development has changed since 1957 to that of "optimal and sustainable utilization,"[327] the questions posed by Prof. Trelease remain relevant.

As discussed in Part I, international water law does not in and of itself, apportion or allocate the waters of international watercourses, it does not determine which side to favor in a conflict.

"*Pacta sunt servanda,* the cardinal rule of international law, prohibits the breaking of agreements. But what role should international law play in the making of agreements?"[328] A leading non-lawyer in transboundary water policy described international law as "poorly developed, contradictory, and unenforceable."[329] If we assume this to be an accurate statement,

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[325] Frank J. Trelease, *A Model State Water code for River Basin Development,* 22 LAW & CONTEMP. PROBS. 301, 321 (1957).
[326] *Id.* at 307.
[327] United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses, UN Doc. A/Res/51/869, May 21, 1997 [hereinafter 1997 UN Convention] Article 5(1).
[328] Dajani *supra* note __at 62.
[329] Aaron T. Wolf*, "Water Wars and Other Tales of Hydromythology,"* 112 in WHOSE WATER IS IT?: THE UNQUENCHABLE THIRST OF A WATER HUNGRY WORLD, Douglas Jehl & Bernadette McDonald, eds (2003).. *See also* Aaron T. Wolf, *Criteria for equitable allocations: The heart of international water conflict,* Natural Resources

the law of international watercourses still plays a significant role in the negotiation of watercourse agreements.

Law seldom provides the solution to interstate or international water disputes. Within the federal system of the United States the United States Supreme Court has original jurisdiction to decide disputes between states.[330] Over the past 100 years the Court has decided numerous equitable apportionment cases. "In only three equitable apportionment cases has the Court actually decreed a division of the waters of a river on an interstate basis."[331] In most other cases the Court admonishes the parties to negotiate an agreement to resolve their differences.[332]

In one of the few international case regarding the non-navigational use of an international watercourse the International Court of Justice reached a similar conclusion for the equitable utilization of the Danube by Slovakia and Hungary.[333]

> [T]he Parties (Slovakia and Hungary) … must find a satisfactory solution for the volume of water to be released into the old bed of the Danube and into the side-arms on both sides of the river. It is not for the Court to determine what shall be the final result of these negotiations to be conducted by the Parties. It is for the Parties themselves to find an agreed solution that takes account of the objectives of the Treaty, which must be pursued in a joint and integrated way, as well as the norms of international environmental law and the principles of the law of international watercourses.[334]

The restraint exercised by the United States Supreme Court and the International Court of Justice reflects the complexity of apportioning a transboundary watercourse among riparian sovereigns. Judicial remedies for apportionment are not likely to be available. The states must negotiate this for themselves in a manner that permits compliance by all parties. Law maintains a significant role by establishing norms and standards for the negotiations.

Forum Vol 23, #1, Feb. 1999, pp. 3-30 "international water law is ambiguous and often contradictory, and no mechanism exists to enforce principles which are agreed-upon." (before note 2).

[330] US Constitution, Art. 3,§2

[331] LEGAL CONTROL OF WATER RESOURCES, SAX et al, eds. (1986), 868.

[332] *See* Oklahoma v. New Mexico, 501 U.S. 221, 241 (1991), *and the cases cited therein.*

[333] The *Danube Case supra* note __.

[334] *Id* at par 140-141.

Henkin offers the following observations on international law:

> International norms will … determine choice among alternatives. With more than one way of achieving a desired policy, nations will not readily choose the one that violates, or more clearly or deeply violates, an international norm or obligation. They will tend to choose the lesser violation, sometimes at substantial sacrifice.[335]

> What matters is not whether the international system has legislative, judicial, or executive branches, corresponding to those we have become accustomed to seek in a domestic society; what matters is whether international law is reflected in the policies of nations and in relations between nations. The question is not whether there is an effective legislature; it is whether there is law that responds and corresponds to the changing needs of a changing society. The question is not whether there is an effective judiciary, but whether disputes are resolved in an orderly fashion in accordance with international law. Most importantly, the question is not whether law is enforceable or even effectively enforced; rather, whether law is observed, whether it governs or influences behavior, whether international behavior reflects stability and order.[336]

The law governing the non-navigational uses of international watercourses is still developing. Brunee and Toope in their articles on environmental security[337] maintain that law and binding legal obligations are only one aspect of utilization of freshwater resources. Building on the concept of security articulated by Robert Ullman that threats are based on events that "degrade the quality of life" or limit policy choices[338] they state that security of the resource must be security at the local and community level not just in state to state relations. Internal conflict over a resource is as damaging to stability as state-to-state conflict over resources. To provide better environmental security, they argue for an "ecosystem regime" guided by general principles which may or may not result in a binding agreement among those involved.

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[335] LOUIS HENKIN, HOW NATIONS BEHAVE, 2d, 45 (1979).
[336] *Id. at* , 26.
[337] Jutta Brunnee & Stephen J. Toope, *Environmental Security and Freshwater Resources: A Case for International Ecosystem Law,* 5 Y.B. Int'l Envtl. L. 41 (1994), Jutta Brunee & Stephen J. Toope, *Environmental Security and Freshwater Resources: Ecosystem Regime Building,* 91 Am. J. Int'l L. 26 (1997).
[338][338] Robert Ullman, *Redefining Security,* 8 Int'l Security 129, 133 (1983).

Brunee and Toope state that environmental and freshwater security must be understood as having two dimensions. The first is an expansive view of security in terms of the environment and maintaining ecological balance; is the resource secure? The second is the more traditional concept of "prevention or management of conflict over scarce or degraded resources."[339] It is this approach based on ecosystem regimes that provides security both in state-to-state relations and internally. Increased water security may be the goal of watercourse negotiations; both security for the resource and the ecosystem and for the population relying on the resource.

Law Defines a Bargaining Zone[340]

Using the analysis of Omar Dajani in his seminal article *Shadow or Shade? The Roles of International Law in Palestinian-Israeli Peace Talks*[341] this section examines the role of the law of international watercourses in negotiating agreements. According to Dajani, "[L]aw's influence is not simply a function of the legal sanction that will follow if no deal is reached….[its] influence is also a consequence of the shade it offers….the attributes of legal rules that pull parties to reach an agreement in conformity with them even when enforcement is unlikely."[342]

Watercourse negotiations, like negotiations for any type of agreement, are influenced by many factors, including "the economic costs and benefits of reaching agreement and of continuing to negotiate; interests in maintaining an ongoing relationship with the other party; social norms; cultural difference; power disparities; even spite or distrust."[343]

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[339] Brunee & Toope 1997 *supra* note __, 27.
[340] Omar M. Dajani, *Shadow or Shade? The Roles of International Law in Palestinian – Israeli Peace Talks*, 32 YALE J. INT'L L. 61-67 (2007).
[341] *Id.*
[342] *Id.* at 71.
[343] *Id.* at 66.

International water law is a relatively new discipline with limited development in international tribunals. The International Law Commission conducted extensive examination of state practice and existing agreements to discern three principles that have crystallized into customary international law. McCaffrey sets forth these laws as follows:

> *Equitable and reasonable utilization:* Shared water must be used in a manner that is equitable and reasonable vis-à-vis co-riparian state;….
>
> *Prevention of significant harm:* Countries must do their best to prevent uses within their territories from causing significant harm to other states;…[and]
>
> *Prior notification:* …[A]state must notify other states of planned activities that may adversely affect those other states. Potentially affected states must be permitted to comment on and consult with the notifying state concerning the plans.[344]

Only the third principles, prior notification, may be implemented unilaterally. The second principle, prevention of significant harm, requires knowledge of conditions in other riparian states. The first principle, equitable and reasonable utilization, requires tat all riparian states reach agreement. This point is emphasized by the decision in the *Danube Case.* The ICJ held that diversions by Slovakia, even though similar to what was contemplated by a treaty between Czechoslovakia and Hungary, violated Hungary's "basic right to an equitable and reasonable sharing of the resources of an international watercourse."[345] The ICJ went on to solidify the principle of equitable and reasonable utilization as international law by referencing the 1997 UN Convention and quoting the second paragraph of Article 5, "watercourse States shall participate in the use, development and protection of an international watercourse in an equitable and reasonable manner."[346] McCaffrey states that the Court quoted the second paragraph of Article 5 regarding participation instead of the first paragraph regarding use

[344] STEPHEN C. MCCAFFREY, AARON WOLF, SHARING WATERS, SHARING BENEFITS, forthcoming 2009. Stephen C. McCaffrey served as *special rapporteur* to the ILC>
[345] Danube Case *supra* note __ at par. 78.
[346] *Id.* at par. 147.

because the second paragraph more closely reflects the outcome of the case—a recitation of treaty breaches and inequitable uses and a strong recommendation for the parties to negotiate a solution "that takes account of the objectives of the Treaty (Hungary/Slovakia), which must be pursued in a joint and integrated way, as well as the norms of international environmental law and the principles of the law of international watercourses." [347] The Court did not articulate what the negotiated solution should be.

The United States Supreme Court in deciding an equitable apportionment case between the states of Kansas and Colorado strongly recommended to the parties that they negotiate an apportionment of the Arkansas River. The Court declined to take on this task stating:

> The reason for judicial caution in adjudicating the relative rights of states in such cases is that, while we have jurisdiction of such disputes, they involve the interests of quasi-sovereigns, present complicated and delicate questions, and, due to the possibility of future change of conditions, necessitate expert administration rather than judicial imposition of a hard and fast rule. Such controversies may appropriately be composed by negotiation and agreement, pursuant to the compact clause of the Federal constitution. We say of this case, as the court has said of interstate differences of like nature, that such mutual accommodation and agreement should, if possible, be the medium of settlement, instead of invocation of our adjudicatory power.[348]

The Court went on to examine the controversy within the legal parameters of equitable apportionment indicating that judicial intervention would occur only when one state breached its obligation to the other.

> "The lower state is not entitled to have the stream flow as it would in nature regardless of need or use. If, then, the upper state is devoting the water to a beneficial use, the question to be decided, in the light of existing conditions in both states, is whether, and to what extent, her action injures the lower state and her citizens by depriving them of a like, or an equally valuable, beneficial use."[349]

The states of Kansas and Colorado negotiated a Compact with the assistance of federal authorities, the purpose of which is to equitably apportion the waters and administer the

[347] *Id.* at par. 141.
[348] Colorado v. Kansas, 320 U.S. 383, 392 (1943).
[349] *Id.* at 391-392.

operation of a new reservoir. The parties and the federal government changed the watercourse facts by increasing the supply with new storage facilities and used the law of equitable apportionment to set the bounds of the negotiations.[350]

These two examples, the *Danube Case* and *Colorado v. Kansas*, indicate the need for negotiated agreements to establish entitlements to international and interstate watercourses. Within each state there are strong constituencies with rights to water based on local law who urge maximum allocation without concern for equitable apportionment with other riparian states. The court decisions confirm the legal obligations of each state and provide the political cover, the shade, needed to pull the parties to negotiate reasonable allocations.

Soft Law Influences Positions

There is a large and increasing body of "soft law" regarding the utilization of international watercourses. Soft law furthers negotiations by serving as the default rules, the standards, concepts and principles around which a deal may be structured. When a state-to-state negotiation arises to which that non-binding concept applies a state that previously voiced support of the concept in the abstract may not be able to ignore it.

This section discusses three "soft law" concepts impacting watercourse negotiations. The first two, water for vital human needs and sustainable development guide choices and help "to anticipate the contours of a legal remedy" to the situation under negotiation.[351] The third soft law is sovereignty over natural resources. It is discussed for its potentially negative influence on watercourse negotiations. Though sovereignty over natural resources is a principle of international law, the assertion of sovereignty over an international watercourse is antithetical to sharing the resource through equitable apportionment. World Bank policies also have a

[350] *See,* Kansas v. Colorado, 514 U.S. 673(1995) *for a discussion of the water supply added by constructing a storage facility.*.
[351] *See* Dajani *supra* note__.

significant impact on watercourse negotiations and are discussed below for the direct influence the World Bank exerts over watercourse projects and for the secondary influence on the development of international law.

Water for vital human needs

Foremost among the soft laws regarding utilization of international watercourses is water for basic human needs. A human right to water is set forth in General Comment 15—The Right to Water prepared by the Committee on Economic, Social and Cultural Rights. Water for vital human needs is the only use given a priority in the 1997 UN Convention[352] for utilization of an international watercourse. The relationship between these two documents is discussed below.

Peter Gleick discusses basic water requirements for human needs in terms of drinking water, sanitation, bathing, and food preparation.[353] He is careful to point out the variability in basic requirements based on environmental factors including the local climate and distance to water sources. Given these variables he estimates the basic water requirements for human life to be a minimum of 25 liters per person per day.[354] "Adding water for bathing and cooking raises the total range to between 27 and 200 liters per capita per day, bracketing the level of 100 liters per capita per day … as typical household demand in water-scarce regions." Using this as the minimum for basic human needs Gleick indicates that based on the best available data "in 1990 fifty-five countries with a population of nearly a billion people fell below the level recommended."[355] Based on UN and WHO data Gleick estimated that in 2000 more than 1 billion people lacked access to safe drinking water.[356] The World Health Organization estimates

[352] 1997 U.N. Convention *supra* note __,Art. 10.
[353] Peter H. Gleick, *Basic Water Requirements for Human Activities: Meeting Basic Needs,* 21 WATER INTERNATIONAL 86 (1996). Food production and ecosystem maintenance are not included in this calculation.
[354] *Id.* at 88.
[355] *Id.*
[356] PETER H. GLEICK, THE WORLD'S WATER 2000-2001, Ch. 1 (2000).

that in 2002 1.1 billion people are without access to an improved water supply.[357] WHO also estimates that 1.5 million people die each year from diseases related to unsafe water supplies and inadequate sanitation and hygiene.[358]

McCaffrey was the first to address the legal issue of a human right to water in his seminal article in1992.[359] He explores both the concept of using the basic human rights documents, the Universal Declaration of Human Rights,[360] the Covenant on Economic, Social and Cultural Rights[361] and the Covenant on Civil and Political Rights[362] as a basis for such a right and the potential obligations of watercourse states to each other to maintain adequate water to meet vital human needs based on Article 10 of the 1997 UN Convention. He concludes that water is so vital to life that the basic human rights documents should be interpreted to require states to at least exercise due diligence in their efforts to provide water to their citizens.[363]

In 2002 the Committee on Economic, Social and Cultural Rights issued General Comment 15, "The Right to Water" based on Articles 11 and 12 of the International Covenant on Economic, Social and Cultural Rights.[364] This committee does not address the mandatory obligations contained in the Covenant on Civil and Political Rights which moves the right to water away from the right to life under the Covenant on Civil and Political Rights and away from a mandatory obligation as McCaffrey had advocated.

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[357] WHO Facts & Figures updated November 2004. An "improved water supply" is not the same as the "basic human needs" described by Gleick.
[358] *Id.*
[359] Stephen C. McCaffrey, *A Human Right to Water: Domestic and International Implications,* 5 GEROGETWN INT'L ENVTL. L. REV. 1 (1992).
[360] Declaration of Human Rights, G.A. Res. 217, U.N.Doc. A/64 (1948), McCaffrey 1992.
[361] Covenant on Economic, Social and cultural Rights, G.A. Res. 2200, U.N. doc. A/6316(1966), 993 U.N.T.S. 3 (1976).
[362] Covenant on Civil and Political Rights, G.A. Res. 2200, U.N. Doc A/6316(1966), 999 U.N.T.S. 171 (1976).
[363] McCaffrey 1992 *supra* note -- at 24.
[364] U.N. Doc. E/C.12/2002/11, Nov. 26, 2002.

Salman indicates that General Comment 15 can be "characterized as a need or an entitlement embodied as a right."[365] The language of Paragraph 10 of the General Comment continues this less-than-clear characterization.

> The right to water contains both freedoms and entitlements. The freedoms include the right to maintain access to existing water supplies necessary for the right to water, and the right to be free from interference, such as the right to be free from arbitrary disconnections or contamination of water supplies. By contrast, the entitlements include the right to a system of water supply and management that provides equality of opportunity for people to enjoy the right to water.[366]

General Comment 15 strengthens the importance of water to meet human needs but is not clear that co-riparians have obligations to each other in regard to availability of water. The core obligations are for infrastructure, financing for infrastructure, and for water supply. While couched in terms of "human rights" General Comment 15 addresses issues related to financing and the "core obligations" are somewhat removed from the objective of providing, delivering or obtaining water for people in need.[367] General Comment 14, the right to the highest attainable standard of health, contains a clear statement of a core obligation for all states "to ensure access to…an adequate supply of safe and potable water."[368] General Comment 14 contains a more direct obligation for a state to provide water to maintain human rights than General Comment 15 which directly addresses the Human Right to Water. The state obligations to meet a human right to water cannot be answered at this time or in this paper.

The more fundamental question to the discussion of equitable utilization of an international watercourse is whether watercourse states have a legal obligation to consider or address the human needs that exist in other states utilizing the same watercourse. Human rights

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[365] SALMAN M.A. SALMAN & SIOBHÁN MCINERNEY-LANKFORD, THE HUMAN RIGHT TO WATER, LEGAL AND POLICY DIMENSIONS, 66(2004).
[366] Gen. Comment 15 par. 10.
[367] *See generally* Salman & McInerney-Lankford 2004.
[368] General Comment 14 par. 43. This General Comment is based on Article 12 of the Covenant on Economic, Social and Cultural Rights, the same basis as General Comment 15 which also is based on Article 11.

law protects individuals from actions by their own government but do international watercourses create a situation that requires an interstate obligation. Is it necessary for State A to utilize an international watercourse in a way that protects or at least does not interfere with the basic human needs for water in State B? The following examination of the 1997 UN Convention, Part II, General Principles addresses that question.

Article 5, Equitable and reasonable utilization and participation, and Article 7, Obligation not to cause significant harm, are the key substantive provisions of Part II containing the general principles of the 1997 UN Convention. As discussed in Part I of this paper, each of these standards for use of an international watercourse requires comparison to other uses, more particularly comparison to uses in other states and an examination of the impacts in other states. The utilization of a watercourse in one state is never considered in isolation. Therefore State A has a general obligation to consider the consequences of water utilization within its territory on all other watercourse states.[369]

Article 6 lists the factors relevant to equitable and reasonable utilization which include "the social and economic needs of the watercourse States concerned" and "the population dependent on the watercourse in each watercourse State." Using these factors alone, an argument may be made that a use in State A that depletes or pollutes water needed in State B for basic human needs is inequitable and unreasonable.

The 1997 UN Convention, Article 10 of Part II titled Relationship between Different Kinds of Uses, provides additional support for this line of reasoning. Article 10 references both Article 5, Equitable and Reasonable Utiltization and Article 7, Prevention of Significant Harm:

Article 10
Relationship between different kinds of uses

[369] 1997 UN Convention Art. 5

1. In the absence of agreement or custom to the contrary, no use of an international watercourse enjoys inherent priority over other uses.

2. In the event of a conflict between uses of an international watercourse, it shall be resolved with reference to articles 5 to 7, with special regard being given to the requirements of vital human needs.

Can this provision be used to protect "vital human needs"[370] in one state from interference by another state? This author asserts the answer is yes. What is equitable and reasonable utilization and participation required by Article 5 includes the factors of Article 6 which take into account providing for the population in need of water. Relying on the draft articles that would become the 1997 UN Convention, McCaffrey draws a similar conclusion.[371]

> "In our hypothetical fact situation, a conflict has arisen between the hydroelectric and agricultural uses of state A, on the one hand, and the domestic (specifically, drinking water) uses of states B and C, on the other. Article 10 would require that in allocating their shared water resources, the co-riparian states pay "special attention" to the drinking water needs of the populations of B and C. This, in effect, gives priority to the use of water for drinking over its use for power generation or agriculture, in the event that they come into conflict, as in our hypothetical case. The rationale for such a result would presumably be that human life (here, in states B and C) takes priority over economic development (here, in state A). While this proposition may not be particularly controversial in the abstract, it could well be politically difficult for the government of state A to "sell" to its population."[372]

As has been discussed herein, there is acceptance of the concept of equitable and reasonable utilization as a principle of customary international law binding on all states. This principle has two aspects; one, utilization within State A must be equitable and reasonable and two, that utilization cannot interfere with the equitable and reasonable utilization in State B. In the event of a conflict between State A and State B each is entitled to an equitable and reasonable share provided that each has sufficient water to provide for vital human needs. Therefore any

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[370] "Vital human needs" are defined in the commentary to include drinking water and sufficient water for food production to prevent starvation. McCaffrey 1992 at 22 reference ILC Draft 46 U.N. GAOR Supp. No. 10 U.N. Doc. A/46/10 (1991) at 180 par. 4

[371] McCaffrey 1992 at 22-23.

[372] McCaffrey 1992 at 23

utilization in State A, other than for vital human needs, that deprives State B of sufficient water to provide for the vital human needs of its population is not equitable and is a violation of customary international law.[373] Using this reasoning, states must consider the human needs in other watercourse states to determine if their own use is equitable and reasonable.

The other substantive provision of Part II, Article 7, The Obligation Not to Cause Significant Harm, also requires consideration of impacts in other watercourse states by requiring that a state take "all appropriate measures to prevent the causing of significant harm to other watercourse States." The bridge for cross-boundary liability is built in paragraph 2 of Article 7; "where significant harm nevertheless is caused to another watercourse State, the States whose use causes such harm shall, in the absence of agreement to such use, take all appropriate measures, having due regard for the provisions of articles 5 and 6, in consultation with the affected State, to eliminate or mitigate such harm and, where appropriate, to discuss the question of compensation."

The commentary to Article 7 indicates that the standard imposed on a state through Article 7 is one of due diligence. McCaffrey examines the threshold of harm for legal injury that would result in a violation of this codified provision of international law.[374] "To be sure, the causing of some forms of harm may be considered *per se* unreasonable, as for example, where the harm endangers human health."[375]

McCaffrey goes on to point out that in order "for the 'no-harm' obligation to be breached, three conditions must be satisfied: significant harm must result in one state from activities in another state; the latter must not only have failed to prevent the harm by its conduct but must also have been capable of preventing it by different conduct; and the conduct or use resulting in

[373] See McCaffrey 1992
[374] McCaffrey 2007, *supra* note __ Ch. 11.
[375] *Id.* at 431.

the harm must be unreasonable (inequitable) in the circumstances."[376] A project or use in State A that limits or contaminates the water in State B such that water is not available for vital human needs, for drinking water and for food production, meets these requirements for significant harm. It also may be characterized as inequitable and unreasonable—in both characterizations there is a violation of international law.

The Article 10 reference to Articles 5 to 7 of the 1997 Convention may appear to be a circuitous track; however, it ties water for "vital human needs" to principles of international law binding on all states and thereby creates a duty for all states in relation to all other states, and arguably all other humans, not to interfere with the human needs along a given watercourse. This does not mean that individuals within State B have a remedy against State A. International law has not reached the point of providing such rights, however, in the relations between states, in the negotiations of a watercourse agreement, the state without adequate water to meet vital human needs should prevail against activities within any other watercourse state which interfere with the availability of sufficient water.[377]

Sustainable development

The concept of sustainable development is a policy for the interaction between resources and people for global development. The need for this policy is articulated by the World Commission on Environment and Development, an independent commission called by the United Nations General Assembly. The Commission defined sustainable development as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs."[378] Since the publication of the commission report, *Our*

[376] *Id.* at 445
[377] *Id. at* 371.
[378] WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT, OUR COMMON FUTURE, 8 (1987).

Common Future,[379] in 1987 the concept of sustainable development has permeated the international declarations related to resource development including those governing international watercourses.[380]

The ILC draft of the 1997 UN Convention as referred to the General Assembly includes the concept of sustainable development in Article 24, Management, which suggests joint mechanisms for "planning the sustainable development of an international watercourse."[381] The ILC did not include sustainable development as a component of the general principles contained in Article 5.[382] Article 5 did, however, include concepts that support sustainable development such as reasonable utilization,[383] protection of the watercourse,[384] consideration of the effects of planned development,[385] and pollution prevention.[386] It was not until the General Assembly added "sustainable" which reads as follows in the 1997 UN Convention:

> [A]n international watercourse shall be used and developed by watercourse States with a view of attaining optimal *and sustainable* utilization thereof and benefits therefrom, taking into account the interests of the watercourse States concerned, consistent with adequate protection of the watercourse.[387]

In the *Danube Case* Vice President Weeramantry writing separately specifically addresses the "Concept of Sustainable Development." Justice Weeramantry explained the importance of this concept as follows: "The Court must hold the balance even between the environmental considerations (Hungary) and the development considerations (Slovakia) raised by the respective Parties. The principle that enables the Court to do so is the principle of

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[379] *Id.*
[380] *See,* Convention on Cooperation for the Protection and Sustainable Use of the Danube River 1994, Charte des Eaux du Fleuve Sénégal (OMVS 2002), Southern African Development Community Revised Protocol on Shared Watercourses 2001.
[381] *Id.*, Art. 24.
[382] 1994 ILC Report.
[383] 1997 U.N. Convention, *supra* note --, Art. 5(1).
[384] *Id.*
[385] *Id.,* Part III.
[386] *Id.,* Part IV.
[387] *Id.* Art. 5 (1) clause 2.

sustainable development."[388] The Court in the majority opinion refers to sustainable development as a *concept* and Judge Weeramantry so titles his discussion, but the thrust of his argument is that it is a *principle* of international law with normative value essential to the resolution of the dispute between Hungary and Slovakia.[389] He maintains that development and the right of each sovereign state to develop is a principle of international law and that protection of the environment is equally founded in international law. "While … all peoples have the right to initiate development projects and enjoy their benefits, there is likewise a duty to ensure that those projects do not significantly damage the environment."[390] The way this is accomplished is through the requirements of sustainable development.

> The concept (of sustainable development) has a significant role to play in the resolution of environmentally related disputes. The components of the principle come from well-established areas of international law – human rights, State responsibility, environmental law, economic and industrial law, equity, territorial sovereignty, abuse of rights, good neighbourliness – to mention a few. It has also been expressly incorporated into a number of binding and far-reaching international agreements, thus giving it binding force in the context of those agreements. It offers an important principle for the resolution of tensions between two established rights. It reaffirms in the arena of international law that there must be both development and environmental protection, and that neither of these rights can be neglected.[391]

According to Judge Weeramantry, watercourse agreements that contemplate development must be consistent with sustainable development which he characterizes as a principle of customary international law. The majority of the ICJ characterize sustainable development as a concept, but its acceptance in international agreements and declarations[392] is sufficiently pervasive that parties negotiating watercourse agreements should give due consideration that a watercourse is developed in a sustainable manner.

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[388] Danube Case *supra* note --, separate opinion of Judge Weeramantry, A—page 1
[389] *Id*.
[390] *Id. at* 4.
[391] *Id.* at 6.
[392] See *Id.* at 4-5 for a list of documents.

Sovereignty

"Sovereignty" is a word with great power. It is a political principle. It includes concepts of rights, territory and inviolability. In connection with watercourses it is used in two distinctly different ways. First is the sovereign equality of states to share in the benefits of an international watercourse. Second is the assertion of sovereignty over a watercourse. The former is discussed in Part I as a foundational principle of equitable and reasonable utilization. The latter is discussed below.[393]

Principle 21 of the Stockholm Declaration affirms that "[s]tates have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies…."[394] The same formulation has been reproduced in other binding and non-binding international instruments. Principle 2 of the Rio Declaration builds on this concept:

> States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction. [395]

The right to development is set forth in a Declaration of the General Assembly which provides as follows in paragraph 2 of the first article:

> The human right to development also implies the full realization of the right of peoples to self-determination, which includes, subject to the relevant provisions of both International Covenants on Human Rights, the exercise of their inalienable right to full sovereignty over all their natural wealth and resources.[396]

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[393] *See generally* Margaret J. Vick, *International Water Law and Sovereignty: A Discussion of the ILC Draft Articles on the Law of Transboundary Aquifers,* 21 PAC. MCGEORGE GLOBAL BUS. & DEV. L.J. 191 (2008); Stephen C. McCaffrey, *The International Law Commission Adopts Draft Articles on Transboundary Aquifers, forthcoming* 103 AM. J. INTERN'L LAW Part III.(2009).

[394] Stockholm Declaration of the United Nations Conference on the Human Environment, Principle 21, June 16, 1972, 11 I.L.M. 1416 (1972).

[395] Rio Declaration A/Conf.151/26, 31 I.L.M. 874 (1992).

[396] A/RES/41/128 adopted by the General Assembly 4 Dec. 1986. See also the Danube Case, separate opinion of Judge Weeramantry at ___

The General Assembly in resolution 1803 (XVII), Permanent Sovereignty Over Natural Resources, declares that:

> "The right of peoples and nations to permanent sovereignty over their natural wealth and resources must be exercised in the interest of their national development and of the well-being of the people of the State concerned."[397]

The concept of permanent sovereignty over natural resources gained recognition in the period of decolonization in the early 1960's.

> The principle of 'permanent sovereignty over natural resources' as the right of peoples and nations to use and dispose of the natural resources in their territories in the interest of their national development and well-being was established by the General Assembly in its resolution 1803 (XVII) of December 1962….While the legal nature of the core principle of 'permanent sovereignty over natural resources', as a corollary to the principle of territorial sovereignty or the right of self-determination, is indisputably part of customary international law, its exact legal scope and implications are still debatable.[398]

Sovereignty over resources is a principle of customary international law,[399] a "hard law," and there is little dispute that states have permanent sovereignty over a resource such as a coal deposit. However, the question remains as to its applicability to an international watercourse. Because the answer to that question is not certain, this principle is discussed as "soft law."

The legal theories related to transboundary watercourses of absolute territorial sovereignty and absolute territorial integrity are comparable to the policy of permanent sovereignty over natural resources. It is well documented that these two theories of sovereignty over a transboundary watercourse are discredited theories of international water law.[400] The assertion of permanent sovereignty over an international watercourse may be considered as

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[397] UN General Assembly resolution 1803 (XVII) Permanent sovereignty over natural resources, 14 Dec. 1962.
[398] Letter dated 29 January 2002 from the Under-Secretary-General for Legal Affairs, the Legal Counsel, addressed to the President of the Security Council, 12 February 2002, S/2002/161 (regarding contracts signed by Moroccan authorities with foreign companies for the exploration of mineral resources in Western Sahara).
[399] Letter dated 29 January 2002 from the Under-Secretary-General for Legal Affairs, the Legal Counsel, addressed to the President of the Security Council, S/2002/161, 12 Feb. 2002.
[400] McCaffrey 2007 *supra* note--, Ch. 5.

political posturing with a discredited legal theory or as an assertion of power during negotiations over an international watercourse.

However, sovereignty over transboundary water resources is a current topic of discussion by the UN Commission on Human Rights in relation to indigenous peoples and by the ILC in relation to transboundary aquifers. These are discussed below for their potential pull on watercourse negotiations.[401]

Indigenous peoples' permanent sovereignty over natural resources[402]

In 2001 the Sub-Commission on the Promotion and Protection of Human Rights resolved to study indigenous peoples' permanent sovereignty over natural resources through a request to the Commission on Human Rights to appoint Erica-Irene Daes as special Rapporteur to prepare a report to the sub-commission.[403] This topic was suggested by the debates about indigenous peoples rights to self-determination and the detrimental impact to indigenous peoples from exploitation of natural resources.[404] In response to questions regarding the nature of permanent sovereignty over natural resources to be exercised by groups not recognized as sovereign states in most regions of the world, the Special Rapporteur defined the scope of her work as "legal,

[401] Permanent sovereignty of the Palestinian people in the Occupied Palestinian Territory, including East Jerusalem, and of the Arab population in the occupied Syrian Golan over their natural resources is the title of resolutions adopted by the General Assembly each session beginning with resolution 3175, 17 December 1973. The natural resources covered by the resolutions include water (See A/res/56/204 (2002), A/res/59/251 (2005) as examples). Sharif S. Elmusa in his article *Dividing the common Palestinian-Israeli Waters; An International Water Law Approach, Journal of Palestine Studies,* Vol. 22, No. 3 (Spring, 1993), pp. 57-77, asserts that the Palestinian sovereignty over natural resources must be read in light of the principles of international law such that sovereignty over water resources means sovereignty over the Palestinian equitable share of the water resources.

[402] This discussion assumes that the water resources of indigenous peoples are transboundary, in that they are within the territory of the indigenous people, but most likely within and subsidiary to the territory of a state and thereby subject to the "governmental control and authority" of both or transboundary in that the water resource is within the territory of the state.

[403] Office of the High Commissioner for Human Rights, Sub-Commission on the Promotion and Protection of Human Rights Resolution 2001/10, 15 August 2001. The Sub-Commission on the Promotion and Protection of Human Rights was replaced by the Human Rights Council Advisory Committee, *see,* G.A. Res. 60/251, March 15, 2006.

[404] *Indigenous peoples' permanent sovereignty over natural resources, Final report of Special Rapporteur, Erica-Irene A. Daes,* E/CN.4/Sub.2/2004/30, 13 July 2004 at par. 5.

governmental control and management authority over natural resources, particularly as an aspect of the exercise of the right of self-determination….In this context, it is apparent that the term 'sovereignty' refers not to the abstract and absolute sense of the term, but rather to governmental control and authority over the resources in the exercise of self-determination. Thus it does not mean the supreme authority of an independent State."[405]

Daes discusses Indian law from the United States as a concept of sovereignty held by indigenous peoples that is subordinate to the sovereignty of states. Given this clarification of the difference between permanent sovereignty over the natural resources of states and that of indigenous peoples, it is more akin to local water laws. Unlike state sovereignty which creates a tension over sharing a resource, the sovereignty of indigenous peoples over water resources is incorporated in the domestic legal system.

Sovereignty and Shared Natural Resources

In 2000 the ILC took up the topic of shared natural resources starting transboundary aquifers. Groundwater and surface water are defined as parts of a unitary system in the 1997 UN Convention.[406] The ILC at the conclusion of its work on the law of the non-navigational uses of international watercourses adopted a resolution on Confined Transboundary Groundwater commending states to follow the principles in the 1997 UN Convention for those waters not included in the definition of watercourse.[407] The ILC work on transboundary aquifers uses the resolution on Confined Transboundary Groundwater as a starting point.

[405] *Indigenous peoples' permanent sovereignty over natural resources, Final report of Special Rapporteur, Erica-Irene A. Daes,* E/CN.4/Sub.2/2004/30, 13 July 2004 at par. 18.
[406] 1997 U.N. Convention Art. 2(a).
[407] Y.B. Int'l L. Comm'n, vol. 2, pt.2, p. 135. *See also* Chusei Yamada, Special Rapporteur, Shared natural resources: first report on outlines, A/CN.4/533 for a discussion of the scope of the 1997 UN Convention.

The draft articles adopted on second reading in 2008 contain a separate article titled "Sovereignty of Aquifer States"[408] which is a different and new legal concept in relation to transboundary waters than any contained in the 1997 UN Convention.

This current work of the ILC on shared natural resources demonstrates the tension between the political principles of sovereignty and the development of transboundary resources. The United States Supreme Court determined that the states of the United States, as quasi-sovereigns, have sovereign control over the water resources within the state; however that control only extends to each state's equitable share of the resource.[409] The ILC Draft Article Three emphasizes that the exercise of sovereignty over a transboundary aquifer shall be "in accordance with the present draft articles." The commentary, however, indicates that this sovereignty article is based on concepts of territorial boundaries, not equitable allocation.[410]

The ILC Special Rapporteur purported to base the draft articles for transboundary groundwaters on the 1997 UN Convention. There is reported discussion that the 1997 UN Convention covered the topic of transboundary aquifers, however, the ILC proceeded to identify the differences between watercourses as defined in the Convention and aquifers within the scope of the draft articles. In essence, the draft articles contain exceptions to the legal principles of equitable and reasonable utilization contained in the 1997 UN Convention. Scientists are developing a better understanding of the interconnectedness of water throughout the hydrologic cycle[411] and an understanding of the nature and extent of what the ILC called confined aquifers.

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[408] ILC Draft Articles Transboundary Aquifers, Art. 3, Report of the Sixtieth session (2008), A/63/10, Ch. IV which reads "Each aquifer State has sovereignty over the portion of a transboundary aquifer located within its territory. It shall exercise its sovereignty in accordance with international law and the present draft articles."
[409] *See* Hinderliter v. La Plata River & Cherry Creek ditch Co., 304 U.S. 92, 102 (1938).
[410] Report of the International Law Commission (2006), A/61/10 at pp. 202-203.
[411] *See e.g.* MALIN FALKENMARK & JOHAN ROCKSTRÖM, BALANCING WATER FOR HUMANS AND NATURE, THE NEW APPROACH IN ECOHYDROLOGY (2004).

However, the legal separation of "watercourses"[412] from "aquifers"[413] creates the potential for conflicting legal standards for water use. Separation of the law for groundwater withdrawal from the law for surface water may lead to situations where neither is sustainable.[414]

Special Rapporteur Chusei Yamada indicates in his reports that members of the Commission requested a specific reference to General Assembly resolution 1803 (XVII) of 14 December 1962, entitled "Permanent sovereignty over natural resources." He recommended that such a reference be in the Preambular language which would not be drafted until the articles were final. The Drafting Committee returned draft articles including the above quoted Article 3 on Sovereignty.[415] The Commentary for Draft Article 3 in the Report of the International Law Commission reflects the lack of consensus on the topic.

> The need to have an explicit reference in the form of draft article on the sovereignty of States over the natural resources within their territories was advocated by many States, particularly by those aquifer States that are of the opinion that water resources belong to the States in which they are located and are subject to the exclusive sovereignty of those States. They also pointed out that groundwaters must be regarded as belonging to the States where they are located, along the lines of oil and gas. Reference was made, in that regard, to General Assembly resolution 1803 (XVII) of 14 December 1962, entitled 'Permanent sovereignty over natural resources'. Some thought that it would be enough to have a reference to it in the preamble while others considered that such reference would be undesirable for the proper management of aquifers.[416]

This focus on sovereignty over the resources is not part of the 1997 UN Convention and the legal theories based on sovereignty over international watercourses were discredited by the work of the ILC in the preparation of the draft articles on which the 1997 UN Convention is

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[412] 1997 UN Convention Art. 2
[413] ILC Draft Articles *supra* note--, Art. 2
[414] *See* Robert Glennon, *The Disconnect between Water Law and Hydrology,* in ARIZONA WATER POLICY, MANAGEMENT INNOVATIONS IN AN URBANIZING, ARID REGION, BONNIE G. COLBY & KATHARINE L. JACOBS, EDS. (2007) for a discussion of the water management difficulties in the state of Arizona which has separate groundwater and surface water legal regimes.
[415] Shared Natural Resources, Titles and texts of the draft articles adopted by the Drafting Committee on first reading, 7 June 2006, A/CN.4/L.688.
[416] *Id.*

based. The topic of shared natural resources and the manner in which the ILC chose to approach the topic invite the application of the concept of sovereignty to transboundary water resources.

In 2000 the ILC listed the topic of "shared natural resources of States" as an appropriate topic for its long-term program of work. The Special Rapporteur proposed first to take up the topic of confined groundwaters and then oil and natural gas. This sandwiched transboundary groundwaters between the law of international watercourses codified in the 1997 UN Convention and the law of mineral development including oil and gas which is reflected in General Assembly resolution 1803. The Special Rapporteur proposed draft articles for discussion based on the 1997 UN Convention noting the physical differences between confined groundwaters and renewable surface supplies. He noted that the first discussions within the Commission and the Sixth Committee included concern with the term "shared"[417] and with use of equitable and reasonable utilization as the legal standard.[418] This concern resulted in sovereignty being the lead principle in the Draft Articles.

Development of different legal principles for "transboundary aquifers" makes the negotiated definition of the waters covered by an agreement key to the optimal and sustainable development of the resource. The introduction of sovereignty over water based on the territorial limits of a state may pull negotiations in a different direction from the law of equitable and reasonable utilization. It would be unfortunate if the work of the ILC on shared natural resources legitimizes sovereign as opposed to equitable claims to international watercourses. The relative importance of these concepts must be resolved through negotiations.

[417] Second Report on shared natural resources: transboundary groundwaters, Chusei Yamada, Special Rapporteur, 9 March 2004, A/CN.4/539 at pars. 3-4.
[418] *Id.* at par. 7.

World Bank Policies

World Bank policies for the development of international watercourses are not in the same classification as the "soft law" discussed above. Yet, they have a significant influence over watercourse agreements and over the implementation of both "soft" and "hard" law.

> [T]he policies, procedures, codes of conduct, and guidelines of multilateral financial institutions, such as the World Bank Group and of other United Nations specialized agencies…are not binding in the traditional sense, (but) they have considerable practical impact, especially throughout the developing world. In part, this impact occurs because the financial leverage of institutions such as the World Bank enables them to impose environment-related instruments such as "green' loan conditions and environment-related policies as part of their financing activities. Further, the application of these instruments by multilateral financial institutions helps support traditional treaty law because many of these instruments explicitly or implicitly further the aims of international environmental agreements. *Thus, in a world where the efficacy of a legal instrument is based upon its capacity to generate compliance, the policies of the World Bank and similar institutions may be highly effective in promoting international environmental treaties, in some cases more effective than many of the traditional sources of international environmental law.*[419]

McCaffrey argues that the operational policies of the World Bank, which, for the most part, are set by developed countries and accepted as conditions of funding by developing countries, contribute to the development of customary international water law.[420]

The World Bank is instrumental in instigating watercourse negotiations. It is Bank policy to require notification and receive a "non-objection" from all watercourse states before funding a watercourse project.[421] These policies have been in place since 1956 with the objective of ensuring "that riparians did not undertake projects with Bank financing to the detriment of other riparians, especially in the absence of adequate notice and opportunity for consultation. Thus,

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[419] Charles E. DiLeva, *International Environmental Law and Development,* 10 GEO. INT'L ENVTL. L. REV. 501 (1998) *emphasis added*. At the time this article was published the author was Senior counsel, Legal Department, World Bank. (emphasis added)

[420] Stephen C. McCaffrey, *Some Developments in the Law of International Watercourses,* in *Some Developments in the Law of International Watercourses* , Chapter 44, in PROMOTING JUSTICE, HUMAN RIGHTS AND CONFLICT RESOLUTION THROUGH INTERNATIONAL LAW, LIBER AMICORUM LUCIUS CAFLISCH, 781, 790 MARCELO G. KOHEN ed. (2007). While the overall result may be to view wide spread acceptance of World Bank policies this author submits that domestic compliance by developed countries and the voluntariness of developing country compliance should be examined before asserting customary international law status for loan conditions.

[421] DeLeva *supra* note__at 519-520, World Bank Operational Manual, Operational Policies (OP) 7.50(6) (2004).

Bank policy was largely consistent with current international treaties many years before their development."[422]

The current Operational Manuals require more than notification. The Bank makes a determination that a project does not cause appreciable harm viewed from both downstream and upstream perspectives.[423] Though McCaffrey asserts that the Bank "is in a position analogous to that of a third-party dispute-resolution mechanism, in that it interprets and applies international standards in concrete cases"[424] the Bank attempts to limit this role by basing its evaluation on a determination of "appreciable harm" not by determining an equitable and reasonable utilization.

> By using the 'appreciable harm' and 'adverse effect' formulation, the Bank is not rejecting the 'equitable utilization' formulation. In fact, it has been noted that the 'equitable use' formulation is considered the 'cornerstone' of the law in this field. In the Bank's view, however, the equitable use analysis could require the Bank to act more in the nature of a tribunal, adjudicating issues of equity and distribution between the parties; whereas the 'appreciable harm' or 'adverse effect' formulation is more of a purely scientific determination, akin to the environmental assessment/economic analysis required of Bank investments.[425]

The leverage of World Bank financing strongly influences a state to comply with the notification provisions of Part III of the 1997 UN Convention for planned measures. In many instances it is through the influence of World Bank policies and the state compliance with lending agreements that customary international law, treaty obligations and "soft law" principles are implemented.[426]

Conclusion

> "As a growing body of international law and international relations literature suggests, the influence of legal rules does not turn solely on the possibility of third party

[422] DiLeva at 520, World Bank Operational Manual, Operational Policies (OP) 7.50, Bank Procedures (BP) 7.50 and Good Practices (GP) 7.50 (2004) *available at* http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTOPMANUAL/0,,menuPK:64701637~pagePK:51628525~piPK:64857279~theSitePK:502184,00.html .
[423] DiLeva *supra* note __at 530, McCaffrey 2007 *supra* note__ at 785-786.
[424] McCaffrey *supra* note __ at 790.
[425] DiLeva *supra* note __at 531 citations omitted.
[426] DiLeva *supra* note __at 501.

> enforcement; international law's influence also derives from the normative force of the ideas it embodies and its capacity to legitimize negotiated outcomes in the eyes of other international actors and domestic constituencies."[427]

Legitimacy is key to watercourse agreements. Negotiating within the box of widely accepted legal principles adds legitimacy. International law influences negotiations because "the attributes of legal rules… *pull* parties to align a negotiated outcome with them, even when their ultimate enforcement is unlikely."[428]

The division of a finite supply of water among increasing demands is a difficult task. Conflicts among states over water are politically charged in part because of the multiple domestic constituencies with a stake in the outcome which may require economic, political and individual life changes. Sovereign states may divide the water and the benefits of an international watercourse as they agree among themselves. The role of the law is to facilitate the negotiation of an equitable and reasonable solution that is obtainable and sustainable. It is the role of law to lessen the influence of power in negotiations through application of normative principles applied equally to all states.

[427] Dajani *supra* note __at 64-65.
[428] *Id.* at 65

Chapter Seven: Using a *Winters* Methodology

The comparison of uses among all states along a watercourse to determine equitable and reasonable utilization is not an easy task. This paper has established that watercourse agreements help to protect economic development and investment in water infrastructure. Flexibility for the variability of the watercourse and the needs of the watercourse states should be built into the agreement because hanges in circumstances and natural conditions are not likely to alter the obligations in the agreement.[429]

Watercourse negotiations are part law, part hydrology, part engineering and part political strategy. Negotiations require a common data base of watercourse information that is as accurate and complete as the parties are able to acquire. Watercourse negotiations are unique in that the parties may change the facts of the watercourse any number of imaginative ways from adding dams and storage reservoirs to conservation requirements to inter-basin transfers of water, to virtual water trade agreements.

This section describes the methodology used in the United States to establish entitlements to water for indigenous Indian tribes who have not developed in the same way or to the same degree as the non-Indian surrounding communities. This methodology is primarily one of water use planning. This is supported by Article 24 of the 1997 UN Convention which calls for "planning the sustainable development of an international watercourse and providing for the implementation of any plans adopted; and otherwise promoting the rational and optimal utilization, protection and control of the watercourse."[430] The *Winters* methodology described herein may be used for water use planning and as the basis for negotiations. It develops the

[429] *See* The Danube Case.
[430] 1997 UN Convention Art. 24 (2)(a) and (b).

factual basis for presentation of tribal water rights' claims and may be used as the factual foundation for negotiations over international watercourses.

History

In general, the states within the western United States allocate water among individual users based on a system of prior appropriation and beneficial use of water. The first to do so on a river system obtains a superior right over all those who appropriate at a later date. This system of prior appropriation is summarized by the statement that the first in time is the first in right.[431]

During the 19th century indigenous tribes within the western United States were forced from all or large portions of their aboriginal lands by non-Indian settlement. The surviving tribes relocated to or remained on smaller enclaves that were reserved for them by treaty or executive order. This territory, the tribe's reservation, is governed by the tribe and subject to federal jurisdiction but is outside the jurisdiction of the state(s) in which it is located. The state law of prior appropriation does not apply within tribal territory and tribes are not bound by the rules of state water law.[432]

In 1908 the United States Supreme Court decided *Winters v. United States*[433] establishing the legal basis for an entitlement to water for an Indian tribe. The Court held that the tribe was entitled to an amount of water necessary to fulfill the purposes for which the reservation was established. Since 1908 a methodology for determining the quantity of water necessary to fulfill the purposes of the reservation has developed through extensive litigation.

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[431] *See generally,* COHEN'S HANDBOOK OF FEDERAL INDIAN LAW, 2005 ED.,NELL JESSUP NEWTON et all eds., JOHN SHURTS, INDIAN RESERVED WATER RIGHTS, THE *WINTERS* DOCTRINE IN ITS SOCIAL AND LEGAL CONTEXT, 1880S-1930S, (2000), DANIEL MCCOOL, NATIVE WATERS, CONTEMPORARY INDIAN WATER SETTLEMENTS AND THE SECOND TREATY ERA (2002), LLOYD BURTON, AMERICAN INDIAN WATER RIGHTS AND THE LIMITS OF LAW (1991).
[432] An additional legal basis for this distinction is that the title to tribal reservations is held in trust by the United States for the benefit of the tribes.
[433] 207 U.S. 564 (1908).

This chapter discusses the legal principles of the *Winters* doctrine of reserved rights with an emphasis on water rights claims based on this theory. This is followed by a section discussing the similarities between equitable theories of water use and a *Winters* claim comparing the *Winters* factors to Article 6 of the 1997 UN Convention. This chapter concludes with a general discussion of ways in which the *Winters* methodology may inform international negotiations.

The prior appropriation doctrine facilitated the rapid development of the arid western states of the western United States. Prior appropriation rights are quantified at the time of first use and continue until abandoned at which time they revert to the watercourse for the benefit of junior appropriators. The doctrine also encouraged a "race to the river," and over-appropriation of the watercourse using inefficient diversion works. It furthered the philosophy that a drop of water reaching the ocean was a drop of water wasted giving little consideration to the ecology or "natural" resources associated with the watercourse.

It is into this system of "first in time, first in right" that the courts were challenged to incorporate water rights for Indian tribes.[434] The tribes were the first to occupy the lands riparian to the watercourses yet few tribes developed the large river works for irrigated agriculture. The United States government spent billions on major reclamation projects to irrigate non-Indian lands giving non-Indian settlers a priority to water often in violation of treaties or trust obligations to tribes.

It is in this context at the end of the 19th century that the Supreme Court decided the case of *Winters v. United States.*[435]

[434] Shurts in his thorough historical analysis of the *Winters* doctrine dispels the role of the law of prior appropriation played in the actual decision of *Winters.*
[435] 207 U.S. 564 (1908).

Winters Doctrine of Reserved Rights

The Gros Ventre and the Assiniboine Indians reside on the Fort Belknap Reservation in the state of Montana. The northern border of the reservation is the Milk River. In the early 1900's there was not sufficient water in the Milk River to irrigate the lands on the reservation because of upstream non-Indian diversions. This led to litigation by the United States on behalf of the tribes against the non-Indian irrigators in the case of *Winters v. United States.*[436]

Montana follows the law of prior appropriation and though the tribe and the United States used water for irrigation prior to any use by non-Indians off the reservation they did not perfect the water use on the reservation under state law by filing the necessary documents.[437] When the conflict in uses arose the parties argued different theories of law. The non-Indians argued for upholding state law requirements for perfecting prior appropriation rights. The United States argued that water for Indian tribes should have the same legal status as their land. When the tribes ceded vast tracts of land to the United States by treaty, they reserved unto themselves a smaller territory, their reservation. The United States argued that the reservation of land included a reservation of water sufficient to make the land habitable. In essence, the tribe did not relinquish the land that supported their nomadic life and also relinquish the water necessary to support farming on the smaller reserved lands.

The facts of *Winters* were particularly suited to this theory of law. The reservation boundary was set by the Treaty of 1888 between the United States and the tribes as the "middle of the main channel of the Milk River."[438] The Treaty provides that the United States will

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[436] *Id.*
[437] Shurts *supra* note __ citing Montana Laws 1905, chap. 44, sec. 1.
[438] An act to ratify and confirm an agreement with the Gros Ventre, Piegan Blood, Blackfeet, and River Crow Indians in Montana, and for other purposes, Act of May 1, 1888, 50th Cong., 1st Sess., chap. 213, 25 Stat. 113-133, reprinted in KAPPLER, INDIAN AFFAIRS, ch. 1, 216 *available at* http://digital.library.okstate.edu/Kappler/Vol1/HTML_files/SES0261.html#p263.
For a discussion of the signing of the 1888 Treaty see Shurts *supra* note __at Ch. 1 note 2.

provide assistance for irrigation of the reservation and that the United States promises to promote the arts of civilization for the tribe. In addition, the reservation was irrigated prior to the time when the diversions by the non-Indian irrigators depleted the flow of the Milk River.

The Court determined that the dispute between the United States on behalf of the tribes and the non-Indian upstream irrigators would be resolved according to the terms of the Treaty of 1888. The Court held that the Treaty of 1888 reserved for the tribe sufficient water to fulfill the purposes for which the reservation was established. To hold otherwise and deprive the tribe of water would make the Treaty meaningless and illusory.[439]

The courts of the United States elaborated on the reserved water rights doctrine of *Winters* throughout the decades in numerous water rights cases. This history is well documented by legal scholars[440] and is not discussed here. This discussion leapfrogs to two cases which applied the *Winters* doctrine and developed standards to quantify tribal reserved water rights. The first is a 1963 United States Supreme Court case, *Arizona v. California,*[441] which quantified the tribal reserved water rights along the Colorado River developing the standard of "practicably irrigable acreage." The second is the 2001 decision by the Supreme Court of Arizona, *In re the General Adjudication of All Rights to Use Water in the Gila River System and Source (Gila V)*[442] in which the state court takes a realistic view of water use and water needs on reservations in Arizona.

[439] Winters, 207 U.S. 564, 576 (1908).
[440] *See e.g.* COHEN *supra* note __, ch. 19,
[441] 373 U.S. 546 (1963).
[442] *In re the General Adjudication of All Rights to Use Water in the Gila River System and Source,* 201 Ariz. 307, 35 P. 3d 68 (2001) *hereafter Gila V.*

Arizona v. California[443]

In the late 1950's the state of Arizona sued the state of California[444] challenging the Congressional apportionment of the Colorado River in the Boulder Canyon Project Act.[445] The other states in the Lower Basin and the United States joined the action which adjudicated the rights to water within this section and the United States presented claims on behalf of riparian tribes. This case was one of original jurisdiction before the United States Supreme Court[446] who appointed a Special Master to hear evidence and submit findings. The Special Master established a standard of practicably irrigable acreage to measure the amount of water needed to satisfy the purposes of the Indian reservations. In doing so he rejected a standard for tribal reserved rights based on future needs as being too speculative. He rejected a standard based on population as not sufficient to meet the future needs of the reservation and as too speculative. He also rejected an equitable apportionment of the water between the tribes and the states because the tribes are not states for purposes of this doctrine. He determined that the quantity of water reserved was commensurate with the land reserved for the tribe.

> What the United States did, in withdrawing public lands for these Indian Reservations, was to establish areas that could be used in the indefinite future to satisfy the needs of Indian tribes in the United States as those needs might develop. It follows from this that the United States intended to reserve enough water to make the lands productive, in other words, enough to irrigate all of the practicably irrigable acreage.[447]

The Special Master proceeded to hear evidence to determine the amount of irrigable acreage, the practicability of producing crops on this acreage and the appropriate amount of water for each crop, the water duty. He recommended an amount of water for each tribe to be entered into a decree. For example, the Special Master's report indicates that the Chemehuevi

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[443] Arizona v. California 376 U.S. 340 (1964).
[444] *Id.* at 551.
[445] 43 U.S.C. §§617-617t.
[446] U.S. Constitution Art. 3 §2
[447] Report of Special Master Simon H. Rivfind, Dec. 5, 1960, 262-266.

reservation contains 1900 acres of irrigable land within the state of California with a maximum annual diversion requirement of 11,340 acre-feet or up to the quantity necessary to "supply the consumptive use required for irrigation of 1,900 acres and for the satisfaction of related uses, whichever is less, with a priority of February 2, 1907."[448] The priority date is the date the reservation was established. This amount of water for the Chemehuevi reservation is confirmed by the Supreme Court in the water decree.[449]

Water rights were decreed for six reservations along the lower reaches of the Colorado River. All of the reservations are comprised of arid lands riparian to the mainstream with tribal histories of irrigation and reservation histories indicating that the lands were reserved for irrigation purposes.

The cases following *Arizona v. California* dealt with more complex reservation purposes, more complex land use issues and often adamant opposition from water users and state governments to the establishment of tribal water rights. Numerous courts used the standard of sufficient water to irrigate the practicably irrigable acreage (PIA) within a reservation.[450] The Montana Supreme Court in the Big Horn River adjudication clarified the PIA standard as "those acres susceptible to sustained irrigation at reasonable costs."[451]

By the year 2000 irrigated agriculture was not the same economic base for the rural and arid western United States that it was in 1963 when the Supreme Court established the quantification standard of practicably irrigable acreage. The Supreme Court of Arizona faced

[448] Arizona v. California, 376 U.S. 340, 344 (1964). The 1964 decision in *Arizona v. California* is the decree setting forth the rights determined in 1963.
[449] *Id.*
[450] *See,* COHEN *supra* note __, ch. 19.
[451] In re the General Adjudication of all Rights to Use Water in the Big Horn River System, 753 P.2d 76, 101 (Wyo. 1988)..

with the question of quantification for tribes in Arizona established a more expansive standard to measure the water necessary to fulfill the purposes of Indian reservations.

Gila V

The Gila River is tributary to the Colorado River arising in the mountains of far western New Mexico and eastern Arizona. Except for a small section of the headwaters, the Gila River flows within the state of Arizona crossing the state from east to southwest having its confluence with the Colorado River near the border with Mexico at Yuma, Arizona. The tributaries draining the high country of central Arizona include the Salt River, the Verde River and the Agua Fria River. The mountains in the southern part of Arizona within the Gila River basin are drained by the San Pedro. The parties to the adjudication include most of the population with the state of Arizona, the major irrigation interests, the State of Arizona, Indian tribes, and the federal government.

The Gila River adjudication to determine the relative rights of water users within the Gila River System is a massive litigation that began in 1974. Approximately 849,000 people or entities were served, 24,000 became parties filing 78,000 claims to water in the Gila River system.[452] Because of the enormity of this litigation and the complexity of the interrelationship of the claims based on state law, federal law and reserved rights, the Arizona Supreme Court adopted special rules for interlocutory appeal of questions of law that affect the course of the adjudication.[453] *Gila V* is an opinion from one such appeal addressing the single issue: [454] "What is the appropriate standard to be applied in determining the amount of water reserved for federal lands?"

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[452] Joseph M. Feller, *The Adjudication that Ate Arizona Water Law,* 49 ARIZ. L. REV. 405406-407 (2007).
[453] In re the General Adjudication of all Rights to Use Water in the Gila River System and Source, WC-1, WC-2, WC-3, and WC-4 (consolidated), Special Procedural Order Providing for Interlocutory Appeals and Certifications, Sep. 26, 1989 (Ariz.).
[454] *Id.* at A.

This unique procedural posture permits the court to discuss the *Winters* doctrine in general terms not bound to a particular reservation or a particular set of facts. *Gila V* is in the nature of an "advisory opinion" so that the parties, the Arizona Department of Water Resources who serve as the technical advisors to the trial court, and the Special Master may proceed to take evidence using established law for the case.

The Court reviewed the history of reserved rights cases since *Winters*[455] including the case of *Arizona v California,*[456] and held that the United States established reservations for the tribes in Arizona in order "to provide Native American people with a 'permanent home and abiding place' that is a 'livable' environment."[457] The court did not accept arguments to examine the official documentary history of each of the reservations stating that the official record often did not reflect the reality of the reservation establishment. Giving a *realpolitik* explanation the Court stated that "[d]espite what may be set forth in official documents, the fact is that Indians were forced onto reservations so that white settlement of the West could occur unimpeded." Once the reservations were established and the Native Americans isolated thereon the United States government was "less than diligent in its efforts to secure sufficient water supplies for the [Indian] community to develop its arable lands and achieve meaningful economic self-sufficiency and self-determination."[458]

The Court held that the PIA standard articulated in *Arizona v. California* and developed in the Big Horn Adjudication is not the exclusive measure[459] of a reserved right to water. Irrigation may be considered, but "must be both practically and economically feasible."[460] The

[455] Winters v. U.S., 207 U.S. 564 (1908).
[456] Arizona v. California, 373 U.S. 546, 599 (1963).
[457] Gila V at 74.
[458] *Id.* at 75, quoting Arizona congressman Morris K. Udall at 134 Cong. Rc. E562-02 (Mar. 8, 1988).
[459] *Id.* at 79.
[460] *Id.* at 80.

Court went on to negatively comment on water rights for irrigation indicating that in Arizona, "It has been observed that 'irrigation is one of the most inefficient and ecologically damaging ways to use water…'"[461]

The Court held that a homeland is many things and determining the water requirements for a permanent homeland requires a multi-faceted approach. Each tribe is to identify its own needs that may be based on master land use plans[462] and which may include claims to water based on the following:

- The tribal history including traditional practices and rituals that have used water or are related to water;[463]
- The tribal culture[464] and religion;
- The geography, topography and natural resources, including groundwater availability on tribal lands;[465]
- The present and projected future population; [466] and
- The tribe's economic base including development plans.

Each of these are examined by the adverse parties and the court "to determine that they are, in fact, appropriate to a particular homeland."[467]

These factors are used by tribes to develop water rights claims and are the standard for quantification in Arizona. They are similar to the factors set forth in Article 6 of the 1997 UN Convention used to determine equitable and reasonable utilization.[468]

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[461] *Id.* quoting Walter Rusinek, Note, *A Preview of coming Attractions? Wyoming v. United States and the Reserved Rights Doctrine,* 17 ECOLOGY L. Q. 355, 410 (1990).
[462] Gila V *supra* note __ at 79.
[463] *Id* at 79.
[464] *Id*.
[465] *Id.* at 80.
[466] *Id.* at 80.
[467] *Id.* at 80
[468] See Table 1 infra.

Winters Methodology and International Watercourses

This section explores the ways the process for developing a tribal reserved right claim may be used in negotiations over international watercourses. It begins with a discussion of the differences between these principles of domestic law of the United States and international water law.

The first and most obvious difference between reserved rights and utilization based on international law is the protection afforded a prior appropriator. The "first-in-time" to use water is protected in times of shortage and inadequate supply. This principle usually protects a tribal reserved right since reserved rights are inserted into a priority system with the date the reservation was created, not the first date of beneficial use. Most reservations in the western United States were established in the late 19th century within lands that were occupied by a tribe from "time immemorial." This priority date is prior to construction of major works for the benefit of non-Indian development Therefore, within a priority ranking tribes are usually first in time.

International law does not emphasize priority of use. "[T]he lodestar [of equitable and reasonable utilization] is not simply who got to the river first, or who is upstream and who downstream, but what is equitable and reasonable in the circumstances. No state has an inherently superior claim. The doctrine is 'flexible' in this sense and also in a temporal sense: what is an 'equitable apportionment' may change over time." [469] Water rights based on prior appropriation, including those based on the *Winters* doctrine, are not apportioned and do not change over time. In the event of a shortage of water necessary to supply all rights those "who

[469] McCaffrey 2007 *supra* note __, 388.

got to the river first" receive water to satisfy their full rights while others with later priority dates may receive none.[470] Prior appropriation rights are fixed in time and quantity.

Another significant difference is the legal concept of "reserving" water for future use. International law does not recognize this concept. It is contrary to an equitable apportionment among watercourse states. The Helsinki Rules specifically provide that "A basin State may not be denied the present reasonable use of the waters of an international drainage basin to reserve for a co-basin State a future use of such waters."[471] Each state has an equal right to share the resource provided that a given use does not cause significant harm to another state. This is a dynamic process the balance of which changes as each new use of the watercourse is added and as the natural conditions change.

The rigidity of the law of prior appropriation when presented with the facts of *Winters*[472] created circumstances whereby a legal right to water is "reserved" for future use. The reservation of a legal claim that may ripen into a water right does not prevent others from utilizing the watercourse in the meantime. Those rights with later priority dates are at risk of not having water available when a reserved right is converted to "wet water" by a tribe.

Given these basic differences in legal doctrine, the process used to develop tribal reserved rights offers a useful methodology for multilateral negotiations. Tribes are sovereign governments subject to federal authority but not subject to the jurisdiction of the surrounding states. The level of economic development between the on and off reservation territory is often disparate with many tribal reservations remaining under-developed with high levels of poverty

[470] This example rarely occurs as water is bought and sold, groundwater is used and other mechanisms are used to "wheel" water among users.
[471] Helsinki Rules Art. VII, Helsinki Rules on the Uses of the Waters of International Rivers, INTERNATIONAL LAW ASSOCIATION, REPORT OF THE FIFTY-SECOND CONFERENCE, HELSINKI, 1966, 484; Berlin Rules Art. VII, INTERNATIONAL LAW ASSOCIATION, WATER RESOURCES LAW COMMITTEE: REVISION OF THE HELSINKI RULES AND OTHER INTERNATIONA LAW ASSOCIATION RULES ON WATER RESOURCES, 4TH REPORT, BERLIN 2004,71 ILA, 337, 385 *available at* http://www.ila-hq.org/en/committees/index.cfm/cid/32 .
[472] Winters v. United States, 207 U.S. 564 (1908).

and a lack of basic water infrastructure. The adjudication of tribal claims and the negotiation of tribal rights involve multiple states each with its own water laws.

Acknowledging the differences and the similarities of these systems the next section discusses the use of the "*Winters* methodology" for national water planning, responding to notification of planned measures, and negotiating an international watercourse agreement.

National water planning

The increasing global demand for freshwater makes it critical for the utilization of an international watercourse to be planned and measured. The International Law Commission discussed the importance of national water planning citing the Mar del Plata Action Plan adopted by the United Nations Water Conference in 1977.[473] This Action Plan calls for the development of national and basin-wide water planning for integrated management of land and water resources.[474]

The Arizona Supreme Court in *Gila V* commended tribes for developing master land use plans which incorporate the water requirements for each land use. These plans form the basis of tribal claims and increase the credibility of claims to reserved water for future use.

The first step in development of a water rights claim or water planning is to identify existing uses. For water planning this includes quantifying those uses. Municipal, industrial and agricultural uses are measurable, but cultural and religious uses may defy simple quantification techniques. What is the amount of water necessary to protect a sacred spring or to permit a

[473] Sephen McCaffrey, Third Report on the Law of the Non-Navigational Uses of International Watercourses, 1987 Y.B. INT'L L. COMM'N, vol. 2, pt. 1 at 15, ¶10. See generally id. at ¶¶8 -28.
[474] United Nations Water Conference, Mar del Plata, Arg. 1977, Water Development and Management, Proceedings, Mar del Plata Action Plan 1977, U.N. Doc. E/Conf. 70/29.

baptism? Tribes have based these uses on minimum spring flows and minimum requirements for habitat preservation.[475]

Reserved rights for agriculture based on the legal standard of practicably irrigable acreage have been developed and quantified for more than 50 years. The process includes analysis of soils, water availability, climate, agriculture markets, transportation, and all other aspects of crop production. The sampling criteria are well established. With this analysis the tribe has a credible water claim and knows the realistic potential for food or other crop production and may evaluate the best uses for its lands.

Population projections are an important component of water claims for tribal lands. In *Gila V* the Arizona Supreme Court stated that "to act (to quantify a right) without regard to population would ignore the fact that water will always be used, most importantly, for human needs. Therefore, the number of humans is a necessary element in quantifying water rights….Population forecasts are common in today's society and are recognized and relied upon by the legal system."[476] Tribes use actuarial information including migration patterns to estimate future population and the potential future demand. The distribution of the projected population within different water basins is determined using tribal land use planning.[477] Other economic development plans and the water requirements for each are included in the calculations.

This level of detailed information for water planning is invaluable for the economic development of a state and, as will be discussed in the next part, provides a basis to evaluate the impact of upstream or downstream development on the equities among the watercourse states.

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[475] *Zuni Indian Tribe Water rights Settlement Act of 2003,* P.L. 108-34, 117 Stat. 782 (2003), BONNIE G. COLBY ET AL., NEGOTIATING TRIBAL WATER RIGHTS, FULFILLING PROMISES IN THE ARID WEST, 138-138 (2005).
[476] Gila V *supra* note __ 80.
[477] White Mountain Apache Tribe, Water Development Plan, Appendix N at 5-6, October 30, 1995, on file with author.

Responding to notification of planned measures

Notification to all states on a watercourse, upstream and downstream, of planned measures is recognized as a requirement of customary international law.[478] It is required by the Helsinki Rules as a means to avoid disputes.

> A State, regardless of its location in a drainage basin, should in particular furnish to any other basin State, the interests of which may be substantially affected, notice of any proposed construction or installation which would alter the regime of the basin in a way which might give rise to a dispute as defined in article XXVI. The notice should include such essential facts as will permit the recipient to make an assessment of the probable effect of the proposed alteration.[479]

Notification of planned measures and the opportunity to respond build on a foundation of cooperation among watercourse states. Article 12 of the 1997 UN Convention contains specific requirements for notification.

> Before a watercourse State implements or permits the implementation of planned measures which may have a significant adverse effect upon other watercourse States, it shall provide those States with timely notification thereof. Such notification shall be accompanied by available technical data and information, including the results of any environmental impact assessment, in order to enable the notified States to evaluate the possible effects of the planned measures.[480]

The 1997 UN Convention formalizes the process for notification and the time periods for reply.[481] However, developing a meaningful reply regarding the significant impacts of planned measures may be difficult if a state is less developed than its co-riparians. A downstream state may be able to evaluate the impact on the flow of water reaching its borders after installation of a planned measure upstream but an upstream state may find it difficult to evaluate the impact of planned measures downstream. Both situations require not only an evaluation of the physical impacts to water supply but an evaluation of the change in equitable apportionment of the benefits from the watercourse that may occur as a result of implementing the planned measure.

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[478] STEPHEN C. MCCAFFREY AND AARON WOLF, SHARING WATERS, SHARING BENEFITS World Bank publication.
[479] Helsinki Rules *supra* note __ ,Art XXIX (2).
[480] 1997 UN Convention, Art. 12
[481] *Id.* Arts. 11 – 19.

A state that has prepared a water plan using the "*Winters* methodology" is better able to evaluate the impacts of planned measures. The internal water plan for a state will include the amount of water required for specific uses which may then be used to evaluate the reasonableness of the planned measure in response to plans in another state. A state may ask the question: Given the physical characteristics of the land and the watercourse is the planned measure equitable in terms of its impact on our existing and planned future uses and is the amount of water to be used from the watercourse reasonable when compared to our own water plan? The state may then formulate objections to the planned measure in terms of significant impacts and communicate these objections to other states within the relatively short time period of six months that is provided in Article 13 of the 1997 UN Convention.

Negotiating a watercourse agreement

A more developed state on a watercourse has the advantage of knowing what it has because its water use is established and measurable. Existing uses are quantifiable and the equities of continuing those uses are observable. The equities and reasonableness of any new development is measured against the pre-existing uses. This process finds the developing state at a disadvantage.

For most tribes in the western United States, the presentation of water claims legally based on the *Winters* doctrine and factually supported with credible water use planning result in negotiated water rights settlements.[482] These negotiated agreements establish a fixed quantity of water for the tribe which is approved by the non-Indian water users, the courts and by the United States Congress.

[482] Colby *supra* note __.

The factors to establish a *Winters* claim to water are universal factors used when there are multiple sovereign jurisdictions along a transboundary watercourse which must be shared.

Conclusion

Agreements are negotiated based on the information available at the time, both a common knowledge of the watercourse and the specific knowledge of the needs for one's own future. The "*Winters* methodology" demonstrates that a legal principle may be given concrete meaning when applied to planning and development. In 1908 the United States Supreme Court established the legal principle that the establishment of a tribal reservation includes sufficient water to fulfill the purposes for which the reservation is established. In the 1960's this principle was further defined for farming tribes and measured by sufficient water to irrigate the practicably irrigable acreage of the reservation. The Arizona Supreme Court addressed the issue of quantifying reserved rights to water in 2001 when the suitability and sustainability of water for irrigation in the arid lands of the state of Arizona was viewed as less practicable. The Court adopted a broader measure of water for homeland purposes. This standard provides the parameters to quantify a tribal water claim using scientific studies. The claim is then settled through negotiation or litigation.

The international legal standard is more fully articulated. It is worded in comparative terms but may be used by a watercourse state to guide the preparation of a national water plan for the "optimal and sustainable utilization"[483] of the watercourse "consistent with adequate protection of the watercourse."[484] As this chapter demonstrates, the factors to be examined to determine equitable and reasonable utilization and the factors to determine water utilization for a

[483] 1997 UN Convention Art. 5(1).
[484] *Id.*

tribal homeland are sufficiently similar to demonstrate that the principles of international law may be developed into a water plan.

A watercourse state within an international basin that is less developed may be stymied in the international basin development processes unable to consent to uses by other states without knowing or understanding the potential impact on its own future development. A comprehensive water plan developed using the "*Winters* methodology" permits the incorporation of local water uses, multi-sector utilization and provides a measure for response to potential impacts. It is one way to level the playing field among the states within a basin.

Conclusion to Part II

> *The Beginning point in any negotiation is the knowledge of what you have and what your opponent has. Without that knowledge, any negotiation is a charade.*[485]

Agreements are key to the equitable and reasonable utilization of an international watercourse. Negotiating these agreements is a complex process requiring integration of the human and environmental use of a natural system into a legal document. Water is being used by everyone within the watercourse basin prior to the negotiation of an agreement and those uses must be considered and where appropriate protected. This includes the recognition of the plurality of water law and the effect of a watercourse agreement on other water laws.

Each state has an equal right to equitably utilize a watercourse.[486] This principle alone calls for cooperation and negotiation of water agreements. Each use of water impacts other uses whether they are existing or a possibility for the future. The equitable, reasonable, sustainable and optimal utilization of a watercourse requires the political will to share information, develop

[485] McCool *supra* note ,34 quoting Person Zah, former chairman of the Navajo Nation in *Water: Key to Tribal Economic Development,* in INDIAN WATER 1985: COLLECTED ESSAYS, ED. CHRISTINE MIDLAS & STEVEN SHUPE (Oakland: AILTP/American Indian Resources Institute) 1986 at 77-78.
[486] UN Charter Art. 2(1), 1997 UN Convention Art. 8(1).

common principles and implement them through cooperative institutions. Legitimacy of a basin agreement is gained from recognition of all aspects of negotiations discussed above: understanding the natural conditions, agreeing to alter the natural conditions for the benefit of all, recognizing the legally pluralistic nature of water law, tempering the relative power of a hydro-hegemon, and establishing the role of law in the negotiations. International water law provides a common terminology, factors for consideration and the boundaries for negotiations.

The next and final Part examines agreements from two watercourses, the Colorado River in the United States and the Senegal in western Africa along with the Utton Transboundary Model Agreement for the methods used to apportion water and the institutional and other management regimes. Part III also looks at three basins without basin-wide agreements for what might be their next steps.

Part III
Transboundary Agreements

Part III
Transboundary Agreements

Watercourse agreements set forth the principles for utilization of the resource. The agreements substantiate the legal principles and the uses agreed upon during the negotiations. Agreements provide a level of water security to the parties. Agreements are most commonly administered by multi-party institutions established in the agreement.[487]

This Part examines three watercourse agreements looking at how water is allocated or apportioned among the states and the institutions created to manage the watercourse. Two watercourses with established allocations and basin institutions are discussed: the Colorado River in the Western United States and Mexico, the Senegal River in West Africa. The legal regime for the Colorado River may be the most complex in the world and it is the author's home basin, therefore it receives more extensive discussion. The Senegal Basin has had numerous agreements since 1963, each modifying or rescinding the previous agreement, establishing principles for utilization of the watercourse and changing the basin institutions. The discussion of the Senegal Basin traces the basin agreements in chronological order.

A Model Interstate Water Compact was drafted by a group of experts under the auspices of the Utton Transboundary Resource Center at the University of New Mexico. The Model was prepared for use by states of the eastern United States however, the principles are applicable to all transboundary negotiations.

This Part also includes a discussion of three basins without basin wide watercourse agreements, the Nile, Amu Darya/Syr Darya and the Euphrates/Tigris basins. These three basins are examined using four criteria considered preparatory to entering an agreement: basin wide

[487] The exception to this is in a federal system when the federal, or higher, level of government administers an agreement among lower levels of government. Such an example is discussed in relation to the Bureau of Reclamation administration of the Lower Colorado River.

communication, gathering and exchange of data, common goals and principles, and common institutions.

Chapter Eight: Colorado River, United States and Mexico

The Colorado River rises in the snow pack of the Rocky Mountains of the western United States. It flows in a southerly direction through the states of Colorado, Wyoming and Utah to the Grand Canyon region where the upper basin is demarcated from the lower basin at a point known as Lee Ferry.[488] The Colorado then flows west through Grand Canyon National Park after which it turns south at the southern tip of the state of Nevada forming the border between Nevada, Arizona and California. Farther south it forms the border between the United States and Mexico before entering Mexico between the Mexican states of Sonora and Baja California. It empties what may be left of its flow into the Gulf of California.[489] The Colorado River is approximately 1450 miles long emptying a basin of approximately 240,000 square miles[490] including the most arid regions of the United States.[491] It provides drinking water for an estimated 27 million people in the United States and irrigation for over 3.5 million acres of farmland.[492]

The flow of the Colorado fluctuates considerably from year to year. The massive works on the main stream store approximately four times the average annual flow or 60 million acre feet.[493] The legal allocation scheme for the basin is based on an average annual flow of 16.5

[488] Lee Ferry is a point on the Colorado River where John D. Lee, a notorious figure in Arizona history operated a ferry to cross the river. *See* MARSHALL TRIMBLE, ROADSIDE HISTORY OF ARIZONA 295 (1986). This point on the river is sometimes referred to as Lees Ferry or Lee's Ferry.
[489] *See generally,* NATIONAL RESEARCH COUNCIL OF THE NATIONAL ACADEMIES, COLORADO RIVER BASIN WATER MANAGEMENT, EVALUATING AND ADJUSTING TO HYDROCLIMATIC VARIABILITY (2007) *hereinafter* NRC 2007.
[490] NRC 2007 *supra* note at 1.
[491] NRC 2007 *supra* note at 13.
[492] Bureau of Reclamation, Lower Colorado Region, *Record of Decisions, Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for lakes Powell and Mead, Final Environmental Impact Statement,* Dec. 2007, at 1, *available at* http://www.usbr.gov/lc/region/programs/strategies/RecordofDecision.pdf *last visited 20 Aug. 2008.*
[493] NRC 2007 *supra* note at 14.

million acre feet.[494] Allocations are made according to a complex system of laws which include a treaty between the United States and Mexico, interstate compacts, federal statutes and United States Supreme Court decisions, together referred to as "The Law of the River."[495]

This discussion focuses on the allocation schemes between the United States and Mexico and among the basin states within the United States. The transboundary allocations build upon the first interstate agreement, the 1922 Colorado River Compact[496] which divided the basin into the upper basin and lower basin at the point between Marble Canyon and the Grand Canyon known as Lee Ferry.[497]

The second part of this chapter discusses three major water management institutions within the basin, the International Boundary and Water Commission, the Bureau of Reclamation and the Upper Basin Commission.

Allocations

John Wesley Powell, the first representative of the United States government to explore, study and write about the Colorado Basin recommended to the Congress of the United States that the political lines delineating state boundaries within the western territory be drawn along the basin boundaries. He recognized the importance of the major river systems to development of this arid region, the interconnectedness of different ecological systems and the necessity of maintaining the ecology within different climatic zones to preserve the availability of water in the rivers. He was concerned that separating the mountainous regions from the farm lands by

[494] The 1922 Compact allocates 7.5 maf for the lower Basin, and assumes a balance of 7.5 maf for the Upper Basin. The 1944 Treaty between the United Stated and Mexico requires delivery of 1.5 maf.
[495] *See* Bureau of Reclamation, Lower Colorado Region at http://www.usbr.gov/lc/region/pao/lawofrvr.html *last visited Aug.20, 2008.*
[496] 1922 Compact
[497] MARSHALL TRIMBLE, ROADSIDE HISTORY OF ARIZONA 295 (1986).

political boundaries would separate development from the natural systems that supported it. Powell wrote in 1878[498] that the waters of western rivers must be divided among the states and nations within the basin because when users began to squabble over water, so too would states and nations.[499]

At the turn of the 20th Century, irrigated agriculture expanded in the downstream state of California with the construction of diversion works to central valleys. Negotiations for an interstate agreement began out of fear that California would obtain rights superior to the used in other states based on a theory of interstate prior appropriation,[500] If so, this would curtail development in the other basin states.

This section discusses allocations within the basin beginning with the 1922 Colorado River Compact. This section also discusses the allocations among the lower basin states contained in the 1928 Boulder Canyon Project Act, the allocations among the upper basin states contained in the 1948 Upper Basin Compact and the sub-compacts contained therein, concluding with a discussion of the allocation between the United States and Mexico contained in the 1944 Treaty.

1922 Colorado River Compact

The 1922 Colorado River Compact is a political compromise among the 7 basin states brokered by representatives of the United States. The upper basin states contribute most of the flow to the river from snow melt. The upstream state of Colorado was known at this time for its position of absolute territorial sovereignty[501] maintaining that it had an exclusive right to use all the water within the state. The downstream state of California contributes negligible water to the

[498] 1962
[499] Powell & DeBuys 304-305
[500] *See* Wyoming v. Colorado, 259 U.S. 419 (1922).
[501] Kansas v. Colorado, 185 U.S. 125 (1902), Kansas v. Colorado, 206 U.S. 46 (1907) and Wyoming v. Colorado 259 U.S. 419 (1922).

river but at the time of the negotiations was the fastest developing state in the basin. It diverted water long distances to supply irrigation to the out-of-basin area known as Imperial Valley and had plans for large diversions to supply the out-of-basin growing population of the coastal city of Los Angeles. California would benefit from application of a theory of interstate priorities so that the first to develop would acquire rights to the most water. Arizona was the least developed but most "riparian" state with the mainstream flowing through the northern canyons of the state and forming the border with California. Arizona also contributes water from numerous tributaries including the Little Colorado and Gila Rivers. Arizona wanted rights to water preserved for future development. The three states of Colorado, California, and Arizona advocated different allocation schemes for waters of the Colorado.[502]

At the time of these negotiations the law of equitable apportionment of interstate watercourses was developing in Supreme Court jurisprudence.[503] In a dispute over use of the Laramie River the upstream state of Colorado argued a theory of absolute territorial sovereignty while the more developed downstream state of Wyoming argued for an apportionment based on the law of prior appropriation.[504] The Supreme Court ruled in favor of Wyoming reasoning that it was equitable to apportion the Laramie River between these two states based on interstate prior appropriation, because of their similar state water laws and their similar development histories.[505]

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[502] *See* Charles J. Meyers, *The Colorado River*, 19 STAN. L. REV. 1 (1966) and Jack L. August, Jr. & Grady Gammage, Jr., *Shaped by Water: An Arizona Historical Perspective, in* ARIZONA WATER POLICY, MANAGEMENT INNOVATIONS IN AN URBANIZING, ARID REGION 10 (Bonnie G. Colby & Katharine L. Jacobs eds. 2007).
[503] *See* Kansas v. Colorado*,* 185 U.S. 125 (1902), Missouri v. Illinois & the Sanitation District of Chicago, 200 U.S. 496 (1906), Kansas v. Colorado*,* 206 U.S. 46 (1907), New York v. New Jersey*,* 256 U.S. 296 (1921), and Wyoming v. Colorado*,* 259 U.S. 419 (1922) (for the development of the principle of equitable apportionment of interstate watercourses).
[504] *See* Kansas v. Colorado, 206 U.S. 46 (1907) (Arkansas River) and Wyoming v. Colorado*,* 259 U.S. 419 (1922) (argued beginning in 1916) in which Colorado unsuccessfully asserted "the right of Colorado as a state to dispose, as she may choose, of …all of the waters flowing in the portion of the [Laramie] river within her borders." *Id.* at 457.
[505] Wyoming v.Colorado, 259 U.S. at 465.

Using an interstate system of priorities the Court permitted the first in time to be the first in right within the basin without regard to the state in which the water is used.

The states in the negotiations over the Colorado River feared that if this reasoning were applied to the Colorado River, California would acquire rights to a large portion of the river.[506] The negotiations stalled in attempts to allocate the waters among all the basin states and a compromise was brokered which split the basin into two parts, an upper basin including Colorado, Utah, Wyoming and New Mexico and a lower basin of Arizona, Nevada and California.

The upper basin states agreed to deliver to the lower basin at the point known as Lee Ferry 75 million acre feet of water on average every 10 years, or approximately 7.5 million acre feet per year. This allocation is based on the assumption that the basin generated on average in excess of 15 maf/year providing approximately7.5 maf/year for use in each of the lower and upper basins. With this division, the upper basin states are protected from the voracious development in California leaving Nevada and Arizona to negotiate a division of the lower basin share.[507]

The legislature of the state of Arizona refused to ratify the 1922 Colorado River Compact preventing the unanimous agreement required for it to enter into force.[508] However, this did not stop the powerful interests in California from continuing to pursue federal assistance for major

[506] *See* Meyers 1966 *supra* note ___ .
[507] Arizona did not ratify the 1922 Compact until 1944 ARIZ. REV. STAT. ANN. 645-1311 (2006) and Utah withdrew its initial ratification. (Meyers 1966 *supra* note 10-12. However, Utah reinstated its ratification and the 1922 Compact entered into force after Congress passed the 1928 Boulder Canyon Project Act (45 Stat. 1057, P.L. 70-642 (1928)) permitting entry into force upon ratification of six of the seven basin states providing that California limited its right to 4.4 maf.
[508] 1922 Compact *supra* note__, Art. XI. Arizona remained concerned about "sharing" the river with California, about use of tributaries and about the federal control of river management (*See* Meyers 1966 *supra* note__).

works on the river for flood control and irrigation.[509] In 1928 the United States Congress passed the Boulder Canyon Project Act[510] appropriating funds for a major dam at Boulder Canyon (later named Hoover Dam) where the river forms the border between California and Arizona. Considering the holdout of Arizona, Congress further provided that the 1922 Compact would enter into force upon ratification by six of the seven basin states including California, if California agreed to limit its share of the 7.5 maf/year to 4.4maf/year.[511] With the enactment of the Boulder Canyon Project Act, the Congress of the United States allocated the waters of the Lower Basin.

Lower Basin Allocations

In addition to limiting California to 4.4 maf, the Boulder Canyon Project Act further allocated the remaining lower basin share of 7.5 maf, 2.8 maf to Arizona and 300,000 af to the state of Nevada. All allocations include existing uses and all uses of mainstream water within a state are counted against that state's total allocation. California maintained the right to use any unused allocations and only in the 21st century started reductions to limit uses to 4.4 maf.[512]

The Boulder Canyon Project Act established the federal government as the management entity for the river. The United States Secretary of the Interior was authorized "to construct, operate, and maintain a dam and incidental works in the main stream of the Colorado River" and such diversion dams and canals as necessary to supply the major irrigation projects within

[509] California also sought protection for its population and diversion works from flooding which occurred in the 1890's, 1905, 1916 and 1920. The 1905 flood filled the irrigation diversions to the Imperial Valley and helped form the Salton Sea. Norris Hundley, Jr., *The West Against itself: The ColoradoRiver-An Institutional History* in NEW COURSES FOR THE COLORADO RIVER, MAJOR ISSUES FOR THE NEXT CENTURY, 12 GARY D. WEATHERFORD & F. LEE BROWN eds (1986).
[510] 45 Stat. 1057, P.L.70-642 (1928).
[511] Meyers 1966 *supra* note at 38-41.
[512] NRC Report *supra* note ___ at Box 2.2.

California.[513] The Secretary of Interior carries out management responsibilities through the Bureau of Reclamation (the Bureau).

The legislature of Arizona ratified the 1922 Compact in 1944[514] and proceeded to challenge the allocations contained in the Boulder Canyon Project Act in court. The United States Supreme Court confirmed the lower basin allocations in 1963 in the case of *Arizona v. California.*[515] Arizona then pursued federal funding for construction of works to deliver water to the major cities of Phoenix and Tucson, and in 1968 Congress passed the Colorado River Basin Project Act[516] authorizing the Central Arizona Project and appropriating funds for its construction. This 1968 legislation also authorized construction of major works in the upper basin the allocation scheme for which is discussed next.

Upper Basin Allocations

The states of Wyoming, Colorado, Utah, New Mexico and Arizona entered a compact in 1948 apportioning the upper basin allocation from the 1922 Compact. [517]

Twenty six years after the division of the Colorado River into the upper and lower basins, the Upper Basin states needed to build major river works for in-state storage and carry-over storage to meet the 1922 Compact obligations to the Lower Basin. In order to access federal money for the large reclamation projects the political realities required the states to agree on apportionment. Meyers, in his 1966 seminal article on the Law of the River, described the

[513] *Id.*
[514] A.R.S. §45-1311 (2006).
[515] 373 U.S. 546 (1963). This is the same case that established PIA as the standard to quantify tribal reserved water rights.
[516] 43 U.S.C.A. §§1501-1556 (2000), 82 Stat. 885, P.L. 90-537.
[517] Upper Colorado River Basin Compact, 1948, 63 Stat. 31 (1949) *also available at* http://www.usbr.gov/lc/region/g1000/pdfiles/ucbsnact.pdf .

political situation this way: "All [states of the Upper Basin] were under-developed, none had the resources to go it alone. It was a classic case of hanging together – or hanging separately."[518]

The state of Arizona is allocated 50,000 af/year for use in that portion of the state in the watershed above Lee Ferry.[519] All other allocations are measured as a percentage of annual available supply. Colorado has the beneficial use 51.75%; New Mexico, 11.25%; Utah, 23%; and Wyoming, 14%. The Upper Basin Compact was negotiated at a time of limited development in relation to supply such that each state's percentage allocation is sufficient to includ all existing uses.

In addition to the allocations to each state, the Upper Basin Compact includes four "sub-compacts" apportioning the use of tributaries. The sub-compacts were negotiated separately between the affected states, but within the framework and restrictions of the Upper Basin Compact which is within the limitations of the 1922 Compact. The sub-compacts designate tributary sources of supply from which states may take their percentage shares. Incorporation of sub-compacts within the "master" compact provides basin (granted only the upper basin) and sub-basin management under one umbrella agreement.

Article XI of the 1948 Upper Basin Compact is the sub-compact for the Little Snake River and its tributaries apportioning its waters between the states of Colorado and Wyoming. The states agree to administer this tributary using a system of interstate priorities without regard to the state of use, except in times of curtailment which results from a shortage of supply within the basin. In the event of shortage such that upper basin curtailment is required it is agreed that, to the extent possible, water use from the Little Snake River will be curtailed on an equal basis

[518] Meyers 1966 *supra* note at 27.
[519] Upper Basin Compact *supra* note Art. III(a)(1).

between the states. The parties agree that the Little Snake River is administered by each state according to its water laws.

Article XII of the Upper Basin Compact is a sub-compact between the states of Utah and Wyoming apportioning the use of waters from the Green River and its tributaries. Existing uses at the time of the Compact are apportioned by priority date without regard to state boundaries. Uses initiated after the effective date of the Compact are apportioned 50% to each state. This sub-compact is administered by a Special Water Commissioner who is jointly appointed by the State Engineers of each state.

Article XIII of the Upper Basin Compact is a sub-compact between the states of Colorado and Utah for apportionment of the Yampa River, a tributary to the Green River. The upstream state of Colorado agrees not to deplete the flow of the Yampa River below "an aggregate of 5,000,000 acre-feet for any period of ten consecutive years" as measured at a designated gaging station. No additional administrative institution is created.

The San Juan River is apportioned between the states of Colorado and New Mexico in Article XIV of the Upper Basin Compact. The state of New Mexico is not riparian to the mainstream of the Colorado River but does supply water to the San Juan River tributary which runs through the northwest portion of the state. This sub-compact provides that the upstream state of Colorado "agrees to deliver to the State of New Mexico from the San Juan River and its tributaries which rise in the State of Colorado a quantity of water which shall be sufficient, together with water originating in the San Jan Basin in the State of New Mexico, to enable the State of New Mexico to make full use of the water apportioned to the State of New Mexico by Article III of the [Upper Basin] Compact,"[520] its 11.25% share. All uses as of the effective date of the Compact are recognized with a prior right as are "uses of water contemplated by projects

[520] Upper Basin Compact *supra* note . Art XIV.

authorized." The technical determinations required to make this allocation are made by the Upper Basin Commission. It is reported that New Mexico would not approve the Upper Basin Compact without protection for use of its full 11.25% share from the San Juan River.[521]

Article X confirms and incorporates the 1922 La Plata River Compact[522] between the states of Colorado and New Mexico apportioning this tributary. In the 1922 La Plata River Compact, the State of Colorado agrees to establish and maintain two gaging stations on the La Plata River, one upstream near the community of Hesparus and one downstream near the border with New Mexico. The Compact allocates to New Mexico one half the mean flow as measured at the Hesparus gaging station. However, when the "flow of the river is so low that… the greatest beneficial use of its waters may be secured by distributing all of its waters successively to the lands in each state in alternating periods…the use of the waters may be so rotated between the two states…."[523] This scheme attempts to preserve uses within the downstream state when half the flow is not sufficient to convey the water and provide for its beneficial use. This Compact is administered by the Colorado and New Mexico State Engineers.

The sub-compact format permits negotiation of an agreement closer to the user level and by only those states affected while keeping the negotiations within the framework of the equitable apportionment among the states contained in the Upper Basin Compact and the 1922 Compact. The sub-compact negotiations also took place bilaterally yet under the scrutiny of the other states who share in the 1922 Compact obligations. The sub-compacts apportion the tributaries to meet local conditions, provide protection for existing local uses and permit the states to take water from local resources. Including the sub-compacts within the 1948 Upper

[521] *See* Meyers 1966 *supra* note at 35.
[522] La Plata River Compact, November 27, 1922, http://www.ose.state.nm.us/isc_laPlata_river_compact.html .
[523] Upper Colorado River Basin Compact, *supra* note Art. II Consented to by Congress Jan. 29, 1925, 43 STAT. 796 *available at* (3).

Basin Compact assures all parties that use of the tributaries will not deplete mainstream supply and thereby defeat the upper basin commitment to deliver 7.5maf to the lower basin.

The sub-compacts may be viewed as examples of the principle of subsidiarity "which is a general organizing principle of governance, express[ing] a libertarian value in favor of making decisions and implementing them at the lowest effective level of government...."[524] For natural systems such as watercourses, the tributary sub-basin may be the lowest effective level of governance. Local conditions within the tributary sub-basins impact, if not determine, the allocation schemes at the interstate and international level. This is illustrated by examining the sub-compact allocations negotiated by the upstream state of Colorado.

Colorado is a party to the 1922 Compact, the 1922 La Plata River Compact, the 1948 Upper Basin Compact, and the Little Snake, the Yampa and the San Juan sub-compacts. The 1948 Upper Basin Compacts apportions 51.75% of the available beneficial use of the upper basin supply to Colorado. The Yampa and San Juan sub-compacts require Colorado to deliver designated quantities of water at fixed measuring points for use in the downstream states of Utah and New Mexico respectively. This is a "negative allocation" whereby Colorado bears the risk of lower than "average" flows but benefits from above "average" flows by using all water in excess of the quantity required to be delivered downstream.

The state of Colorado agreed in the Little Snake sub-compact to disregard the state boundary with Wyoming and to allocate the tributary based on the law of prior appropriation. The Upper Basin Commission, with representatives from the four upper division states prepared a schedule of priorities as of the date of signing the sub-compact. Uses initiated in either state after the effective date "shall permit the full use within the Basin in the most feasible manner … without regard to the state line; and, so far as is practicable, shall result in an equal division

[524] ALEXANDRE KISS & DINAH SHELTON, INTERNATIONAL ENVIRONMENTAL LAW, 3rd ed. (2004) at 800-801.

between the States of the use of water not used under rights existing prior to the signing of this [Upper Basin] Compact."[525] All uses are charged to the respective state's allocation and are administered and managed by each state within its jurisdiction.

The1922 La Plata River Compact apportions the annual supply equally between the two states riparian to the tributary. Flow is measured at designated gaging stations and allocated to diversion structures in each state.

The mountains in the state of Colorado form the head waters for the Colorado River. In spite of the states early assertions of sovereignty over waters within its borders,[526] by 1948 the state agreed to multiple and varied allocations to satisfy its negotiated share.

Moving from the interstate allocations of the Colorado River to international allocations, the final agreement examined in this section is the 1944 Treaty between the United States and Mexico.

1944 Treaty with Mexico

In 1944 the United States and Mexico entered a treaty for the utilization of waters of the Tijuana River, the Rio Grande below Fort Quitman, Texas and the Colorado River.[527] At the time, the Colorado basin within the United States was divided into the Upper and Lower Basins with volumetric allocations based on an assumed annual flow of 15maf and the lower basin was further allocated with specific volumetric measures. Mexico is the farthest downstream with less than 1% of the basin land area.

At this time, the agricultural lands in Mexico were underdeveloped compared to the United States which was delivering water to farmers from massive federal reclamation projects.

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[525] Upper Basin Compact *supra* note , Art. XI(b)(2)(f).
[526] *See* note- *supra*
[527] Treaty between the United States and Mexico relating to the Utilization of the Waters of the Colorado and Tijuana Rivers, and of the Rio Grande (Rio Bravo) from Fort Quitman, Texas to the Gulf of Mexico (1944) 59 Stat. 1219, T.S. 94. *Available* at http://www.usbr.gov/lc/region/g1000/pdfiles/mextrety.pdf .

Mexico attempted to negotiate an equitable apportionment of the benefits from the river that would adjust as development of irrigated agriculture increased within Mexico. The United States, having approved the specific allocations to the states in the 1922 Compact and the 1928 Boulder Canyon Project Act, did not have the domestic political support to upset the volumetric allocation scheme among the states even though Article III(C) of the 1922 Compact anticipates a future agreement with Mexico.

The apportionment of the Colorado River between Mexico and the United States is a volumetric allocation. The United States is obligated to deliver no less than 1.5maf/year to Mexico at designated points on the river, reminiscent of the volumetric allocations contained in the 1922 Compact and the 1928 Boulder Canyon Project Act. Mexico may receive more water in any given year but cannot acquire rights to additional water. The parties further agree to install works on the river for carry-over storage to meet this obligation.

The 1944 Treaty, like the interstate compacts, does not allocate water for ecological preservation, does not contain provisions for conservation, pollution prevention or other factors for an equitable and reasonable utilization of an international watercourse.[528] Nor does it address an obligation not to cause significant harm or provide remedies in the event of such harm.[529] However, as is discussed in the next section, the institution created by the 1944 Treaty, the International Boundary and Water Commission, does have limited authority to address these issues.

Institutions

Given that the allocations of the Colorado River are determined by a development strategy from the 19th century whereby a drop of water reaching the ocean is a drop of water

[528] *See* 1997 UN Convention *supra* note ___ Art. 6.
[529] *See*, 1997 *Id.* Arts. 5, 6 and 7.

wasted, the fixed allocation schemes within the lower basin and with Mexico are rigid and archaic. However, the three different management institutions within the basin are worthy of emulation. This section briefly discusses the International Boundary Commission established by the 1889 Treaty with Mexico whose duties were expanded by the 1944 Treaty to include international waters, the Bureau of Reclamation, which is the federal agency that manages the Lower Basin, and the Upper Basin Commission established by the 1948 Upper Basin Compact.

International Boundary and Water Commission

The 1889 Convention between the United States of America and the United States of Mexico established the International Boundary Commission "to facilitate the carrying out of the principles contained in the treaty of November 12, 1884, and to avoid the difficulties occasioned by reason of the changes which take place in the beds of the Rio Grande and Colorado Rivers in those parts which serve as a boundary between the two Republics."[530] The Commission has exclusive jurisdiction to resolve any such disputes.[531] In this regard the IBC is charged with delimiting the boundary between the United States and Mexico, which function it continues to serve today.[532] The 1944 Treaty expanded the duties of the IBC to include water management and the planning and construction of river works thereby changing the IBC to the International Boundary and Water Commission (IBWC).[533]

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[530] Convention between the United States and Mexico, Water Boundary, Extending the Duration of the Convention of March 1, 1889, ___Stat. ___, T.S. 241 *available at* http://www.ibwc.state.gov/Files/TREATY_OF_1889.pdf. , Preamble.

[531] *Id*. Art. I.

[532] *See i.e.,* IBWC Minute 305, *Demarcation and Monumentation of the International Boundary on the Bridges over the Rio Grande at Eagle Pass, Texas-Piedras Negras, Coahuila II; Laredo, Texas-Colombia, Nuevo leon; Laredo, Texas IV-Nuevo Laredo, Tamaulipas III; Pharr, Texas-Reynosa, Tamaulipas; Los Indios, Texas-Lucio Blanco, Tamaulipas; and Beterans, Brownsville, Texas-Matamoros, Tamaulipas III,* December 4, 2000, Cd. Juárez, Chih.

[533] 1944 Treaty, *supra* note ___ Arts. 24 (a) and (b).

The extraordinary aspect of the IBWC is the vesting of authority to make decisions on topics not covered in the 1944 Treaty, in essence amending the Treaty. The decisions of the IBWC are recorded in Minutes. Article 25 sets forth the import of the Minutes:

> Decisions of the Commission shall be recorded in the form of Minutes….Except where the specific approval of the two Governments is required by any provision of this Treaty, if one of the Governments fails to communicate to the Commission its approval or disapproval of a decision of the Commission within thirty days…the Minute in question and the decisions which it contains *shall be considered to be approved by that Government*. The Commissioners, within the limits of their respective jurisdictions, shall execute the decisions of the Commission that are approved by both Governments. (emphasis added)
>
> If either Government disapproves a decision of the Commission the two Governments shall take cognizance of the matter, and if an agreement regarding such matter is reached between the two Governments, the agreement shall be communicated to the Commissioners, who shall take such further proceedings as may be necessary to carry out such agreement.[534]

To date the IBWC has entered 313 Minutes on a wide range of topics. Recent Minutes have focused on water and sanitation projects within border communities (authorizing transboundary construction and allocating costs) and on ecological improvements particularly in the limotroph section of the River.[535]

The most often cited series of Minutes address salinity levels of the water from the Colorado River as it reaches Mexico. Water quality is not addressed in the Treaty and Mexico, located at the end of the River, suffers the effects of deteriorating water quality. At the March 22, 1965 meeting of the IBWC the commissioners complied with the "instructions" from their respective governments contained in Presidential Communiqués dated March 16, 1962, June 30, 1962 and February 22, 1964 "to reach a permanent and effective solution" to the problems of

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[534] 1944 Treaty, *supra* note___ Art. 25.

[535] *See* Minutes 311 (*Recommendations for secondary treatment in Mexico of the sewage emanating from the Tijuana River area in Baja California*, Mexico, Feb. 20, 2004), 310 (*Emergency delivery of Colorado River Water for use in Tijuana, Baja California*, July 28, 2003), 306 (*Conceptual Framework for U.S.-Mx studies for future recommendations concerning the riparian and estuarine ecology of the limitrophe section of the Colorado River and its associated delta*, Dec. 12, 2000), and 304 (*Joint grant contribution program for drinking water and wastewater infrastructure projects for communities in the United States – Mexico Border Area*, Oct. 26, 2000).

salinity of the Colorado River at the northern border of Mexico. In Minute 218, Recommendations on the Colorado River Salinity Problem, the Commissioners set forth a 5 year plan for construction of drains for saline waters, established a system of accounting to comply with the 1944 Treaty allocations and set forth the responsibilities for construction and payment of new works.

In 1972 the Commission again took up the matter of salinity "in accordance with the instructions which the two Governments issued to their respective commissioners pursuant to the understanding between President Richard Nixon and President Luis Echeverria A., expressed in their Joint Communique." In this communiqué, reproduced in Minute 241, the Mexican government states that the water quality at the northern border of Mexico should be the same quality as the water delivered to California from the diversion works upstream at Imperial Dam. The President of the United States expressed his concern that this was a "highly complex problem" and expressed his desire to find a "definitive, equitable and just solution" but did not agree with the President of Mexico that the water quality at the Mexican border should be the same as delivered to Imperial Valley, California. Based on these instructions the Commission developed maximum levels of salinity and a means to manage highly saline waste water drainage within the United States to reach these levels. This includes water accounting procedures and cost accounting for construction of new works.[536] Again, this Minute had a limited duration of five years.

Borrowing from the language of the Presidential Communiqués reproduced in Minutes 218 and 241 the Commission issued Minute 242 on August 30, 1973 entitled "Permanent and definitive solution to the international problem of the salinity of the Colorado River." Minute

[536] *Minute 241, Recommendations to improve immediately the quality of Colorado river waters going to Mexico, July 14, 1972*.

242 calls for construction of permanent works and sets the maximum level for salinity so that "the approximately 1,360,000 acre-feet (1,677,545,000 cubic meters) delivered to Mexico upstream of Morelos Dam, have an annual average salinity of no more than 115 p.p.m. +/- 30 p.p.m. U.S. count (121 p.p.m. +/- 30 p.p.m. Mexican count) over the annual average salinity of Colorado River waters which arrive at Imperial Dam…." Minute 242 describes the measures to be taken to meet this water quality standard. In addition, the Minute documents that the United States will provide assistance to Mexico in order to rehabilitate the irrigated lands within the Mexicali Valley which were inundated with the saline waters.[537] At the time each state acknowledged this problem the IBWC used its authority to expeditiously address the salinity problems.

While the 1944 Treaty vests independent authority in the Commission, the Commission does not always exercise that authority independently. For example, Minutes 218 and 241 dealing with salinity state respectively that the Minutes must be "specifically" and "expressly" approved by both Governments.[538] Minute 242, "the permanent and definitive solution of the salinity problem" provides that it "is subject to the express approval of both Governments by exchange of Notes."[539] However, absent language in the Minute requiring express approval, the Minutes take effect 30 days from issuance absent *disapproval* of one of the governments. The IBWC has the authority to act on a wide range of border issues. It is, however, dependant on its commissioners to take action. Scholars from both states have called for more active leadership from the IBWC on water management issues.[540]

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[537] Two additional Minutes, 248, dated June 10, 1975, and 284, dated January 18, 1991, address issues of implementation, operation and maintenance of the works authorized by Minute 242.
[538] Minute 241, Resolution pars. 8 and 10.
[539] Minute 242, Par. 8.
[540] *See* Stephen P. Mumme, *Developing Treaty Compatible Watershed Management Reformsfor the U.S. Mexico Border: The Case for Strengthening the International Boundary and Water Commission,* 30 N.C.J. INT'L L. & COM.

In contrast to this quasi-independent international institution, the next section discusses management of the lower basin within the United States by the federal government through the Department of Interior, Bureau of Reclamation.

Lower Basin: United States Bureau of Reclamation

The 1928 Boulder Canyon Project Act (BCPA)[541] authorized the Secretary of Interior to manage the delivery of water and power from Colorado River works constructed with federal funds. Rights to utilize the waters of the Colorado River acquired after passage of the Boulder Canyon Project Act require a contract with the Bureau of Reclamation, the agency designated by the Secretary of Interior. The Bureau collects data and establishes operating procedures in accord with the 1922 Compact, the BCPA, the Supreme Court decisions in *Arizona v. California*[542] and other federal laws. In addition, the Bureau is charged with operation of river works in order to deliver water.

The 1968 Colorado River Basin Project Act[543] authorized and funded construction of additional river works and charged the Secretary to develop criteria for coordinated long-range operation of the Colorado River reservoirs through Annual Operating Plans. The Annual Operating Plans provide for delivery of water for use within each lower basin state as permitted within the allocations established in the 1922 Compact and the Boulder Canyon Project Act.

In 2001 the Secretary approved Colorado River Interim Surplus Guidelines setting forth the process for allocating system water that is "surplus" to the compact and Treaty requirements.[544] In 2007 the Secretary approved "Guidelines for Lower Basin Shortages and

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REG. 929 (2005) and Alberto Szekely, *How to Accommodate an Uncertain Future into Institutional Responsiveness and Planning: The Case of Mexico and the United States,* 33 NAT. RESOURCES J. 397 (1993).

[541] P.L. 70- 642 (1928).

[542] Arizona v. California*,* 373 U.S. 546 (1963), *decree entered* Arizona v. California*,* 376 U.S. 340 (1964), *consolidated decree entered* Arizona v. California*,* 126 S. Ct. 1543 (2006).

[543] P.L. 90-537 (1968).

[544] 66 Fed. Reg. 7772, Jan. 25, 2001 (Vol. 66, No. 17, pg. 772-7782).

Coordinated Operations for Lakes Powell and Mead" which set forth management criteria for years when the supply is not sufficient to deliver the full volumetric allocations to the states and to Mexico.[545] The Surplus and Shortage Guidelines also include criteria for coordinated releases from the major reservoirs. The record of decision adopting the shortage guidelines was issued by the Secretary in December 2007 after an extensive environmental assessment including stakeholder and public participation. The Secretary recognized the need to manage the system to account for the current multi-year drought and to adapt to longer range climate change conditions in a manner acceptable to the states party to the Colorado River Compact.

This process is effective in part because of the authority of the federal government and the availability of recourse by aggrieved parties to the United States federal courts. However, the difficulty of negotiating an agreement to determine the distribution of a shrinking supply in conditions of increasing demand should not be underestimated. The technical evaluation by the Bureau along with submission of its own proposals moved the process from a politicized conflict to an agreed upon technical resolution.

However, absent new federal legislation, the Secretary does not have the authority to alter the basin allocations among perfected rights holders or among the states.[546] Nor may the Secretary alter the requirements of beneficial use or the preference given to agriculture and domestic uses in the 1922 Compact.[547] However, each of the state governments has the authority to regulate how its share of water is utilized.[548] As the resource becomes more scarce

[545] Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead, Record of Decision, 73 Fed. Reg. 19873, April 11, 2008 (Vol 73, No. 71, pg. 19873-19892).
[546] Charles Ashby, *McCain: Renegotiate 1922 Western Water Compact,* The Pueblo Chieftain, Aug. 15, 2008, *available at* www.chieftain.com/articles/2008/08/15/news/local/doc48a548fed1e6f772542859.prt.
[547] 1922 Compact *supra* note ___Art. IV (b).
[548] 1922 Compact *supra* note __, Art II (c)

mechanisms are being developed for market transfers and other means for re-allocation among users.[549]

Upper Basin Commission

The 1948 Upper Basin Compact established the Upper Basin Commission.[550] The Commission is composed of one representative from each upper division state, Colorado, New Mexico, Utah and Wyoming, and a representative appointed by the President of the United States who serves as the presiding officer. The Commission is the administrative body for the upper basin with powers to establish gaging stations, forecast water availability, and make findings for water deliveries and storage losses. The Commission quantifies the volume of water allocated to each state's percentage share of beneficial use. The Commission also determines if curtailment is necessary to meet the Upper Basin obligation under the 1922 Compact to deliver water at Lee Ferry for use in the Lower Basin. In the past decade, drought conditions affecting supply and increased development within the upper basin have brought these accounting measures to prominence in the basin management.

Conclusion

Multiple institutions manage the Colorado River basin loosely coordinated through the federal projects administered by the Secretary of Interior through the Bureau of Reclamation. In addition to the three major institutions discussed above, the tributaries with separate compacts or sub-compacts have their own institutions and management structures. The Law of the River, the complex combination of agreements, legislation and judicial opinions, provides the framework within which the institutions function. The United States Supreme Court offers an ultimate

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[549] *See generally* NEW COURSES FOR THE COLORADO RIVER, MAJOR ISSUES FOR THE NEXT CENTURY, GARY D. WEATHERFORD & F. LEE BROWN, eds. (1986) and Robert Glennon & Michael J. Pearce, *Transferring Mainstem Colorado River Rights: The Arizona Experience,* 49 ARIZ. L. REV. 235 (2007).
[550] Upper Colorado River Basin Compact, 1948, Art. VIII, 63 Stat. 31 (1949) *available at* www.usbr.gov/lc/region/pao/pdfiles/ucbsnact.pdf.

forum for interstate dispute resolution. However, increased drought, climate change affecting snow pack evaporation rates and agriculture requirements are stressing the resource. In addition the basin includes the regions and cities within the United States with some of the fastest growing populations.[551]

Scholars and practitioners have called for a basin-wide international and interstate commission, a lower basin commission and for more federal oversight of water use.[552] These have not garnered sufficient political support to move forward. However, as this basin continues to experience explosive growth, increasing pollution, and new demands for water, the existing institutions will continue to be challenged by the limits of their jurisdiction and the need for basin-wide management solutions.

[551] NRC Report *supra* note__, 51-55

[552] *See,* NRC Report *supra* note__, NEW COURCES FOR THE COLORADO RIVER, *supra* note__, SKELEKY *supra* note __, and (Patrick Schiffer, et al., *From a Colorado Compact Challenge to a New Era of Cooperation Among the Seven Basin States,* 49 ARIZ. L. REV. 217 (2007)).

Chapter Nine: Senegal River

The legal instruments establishing L'Organsation Pour la Mise en Valeur de Fleuve Senegal[553] were lauded for establishing the most progressive and cooperative river management regime of its time.[554] Yet development which proceeded as planned under this legal regime resulted in one of West Africa's largest ecological disasters. [555] The lack of attention to local uses was a primary cause of the problems.

The Senegal River originates in the Fouta Djallon Mountains of Guinea and is formed when the Bafing and the Bakoye (Semefé) Rivers meet near Bafoulabé, Mali. The third major tributary, the Falémé, also originates in the Fouta Djallon Mountains of Guinea and joins the Senegal near Bakel, Senegal. The Falémé forms the border between Mali and Senegal before joining the mainstem. Another tributary, the Karakoa River forms the border between Mali and Mauritania. The Senegal River forms the border between Senegal and Mauritania from upstream of Bakel to the mouth at the Atlantic.

The Senegal flows from the mountain ranges, through steep gorges and over falls until it reaches Kayes where it becomes a semi-arid meandering river. It is a major asset to the basin providing navigation to land locked Mauritania, hydropower, irrigation and fisheries. The damming of the river in the 1980's downstream at Diama to prevent salt water intrusion in the

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[553] Convention Relative au Statut du Fleuve Senegal [Convention on the Statute of the River Senegal], March 11, 1972, signed at Nouakchott, Sen-Mali-Mauritania, LEX-FAOC016004, *available at* http://faolex.fao.org, *hereinafter* 1972 Statute.

[554] Theodore Parnall & Albert E. Utton, *The Senegal Valley Authority: A Unique Experiment in International River Basin Planning*, 51 IND. L. J. 235 (1976), *Third Report on the Law of the Non-Navigational Uses of International Watercourses*, U.N. Doc. A/CN.4/406 and Add.1 and 2, *reprinted in* Y.B. Int'l L. Comm'n, Vol. 2, Part 1, p 21, para 28 (1987), (Stephen C. McCaffrey, Special Rapporteur) *hereinafter* ILC Third Report.

[555] *See* STEPHEN C. MCCAFFREY, THE LAW OF INTERNATIONAL WATERCOURSES, 272-275 (2nd ed. 2007), Margaret J. Vick, *The Senegal River Basin: A Retrospective and Prospective Look at the Legal Régime,* 46 NATURAL RES. J. 211 (2006), BONAYA ADHI GODANA, AFRICA'S SHARED WATER RESOURCES, LEGAL AND INSTITUTIONAL ASPECTS OF THE NILE, NIGER AND SENEGAL RIVER SYSTEMS (1985)

dry season and upstream at Manantali for storage and hydropower provided mixed benefits and problems for the basin and its riparian population.[556]

The four riparian states in western Africa, Guinea, Mali, Mauritania and Senegal, formed the first Senegal River basin institution in 1963, soon after independence. Since then the structure, name and purpose of the institution has changed, however, the existence of this initial institution provided a forum for the leaders of each basin state to meet and to make changes to the framework of their agreements.

Agreements 1963-1978

The four basin states entered a Convention for the development of the Senegal River on July 26, 1963 at Bamako, Mali.[557] The states declared the Senegal an international river and formed an Inter-State Committee whose purpose was to promote and coordinate research and the development of works relating to the river.

The 1963 Bamako Convention was amended in 1964 with the addition of requirements for river and riparian development.[558] Article 1 provides: "The Parties express their desire to develop close co-operation in order to promote the rational utilization of the resources of the Senegal River basin and to ensure freedom of navigation and equality of treatment of its

[556] Joshua T. Newton, *Case Study of Transboundary dispute Resolution: Organization for the Development of the Senegal River (OMVS)* available at www.transboundarywaters.orst.edu/research/case_studies/Documents/senegal.pdf . Newton also published the Sengal River case study in AARON T. WOLF AND JOSHUA T. NEWTON, CASE STUDIES OF TRANSBOUNDARY DISPUTE RESOLUTION (2008); and JERRY DELLI PRISCOLI AND AARON T. WOLF, MANAGING AND TRANSFORMING WATER CONFLICTS, appendix C.16 (2009).

[557] Convention Relative `a l"Amenagement Général du Bassin du Fleuve Senegal [Convention Relating to the General Development of the Senegal River Basin], July 26, 1963 signed at Bamako, Sen.-Guinea-Mali-Mauritania, *excerpts contained in* U.N. Doc. A/CN.4/274 (Vol.1) at 79-80, *hereinafter* 1963 Bamako Convention.

[558] Convention Relative au Statut au Fleuve Senegal [Convention Relating to the Status of the Senegal River], Feb. 7, 1964, signed at Dakar, Sen.-Guinea-Mali-Mauritania, *excerpts and summary contained in* U.N. Doc. A/CN.4/274 (Vol.1) at 81-82 *hereinafter* 1964 Dakar Convention. The 1963 and 1964 Conventions are discussed together. The author found discussions and excerpts of both the 1963 and 1964 Conventions but was not able to locate a complete text of either Convention.

users."[559] Article 11 includes provisions for the construction of works, navigation, agricultural and industrial uses, monitoring the condition of the flora and fauna and protection of the water quality.[560]

Programs or works proposed by one state are required to be approved by the Committee whose decisions were binding on all states. Through the 1964 Convention the Committee took on added functions and responsibilities to be administered through Sectoral Commissions, including:

- developing rules for application of the principles contained in the Convention;
- assembling basic data on the river basin;
- disseminating the data to all basin states;
- examining projects submitted by one state and "studying and executing" projects requested by a state;
- promoting harmonious relations among the states;
- regulating transportation along the river including roads and railways; and
- seeking financial assistance.

A Secretariat was established to be an organ of investigation and liaison with the Committee.[561] The Presidency of the Committee rotates among the states.[562] Financing for the Committee is from the member states and foreign aid.[563]

In 1965 the Conference of the Heads of the Senegal Riparian States passed a resolution for organization of a new institution.[564] This resolution resulted in the 1968 Statute of the Organization of the Senegal Riparian States (OERS).[565] The OERS has an expanded purpose beyond river management to "establishment of the West African Regional Group of States, with

[559] *Id.*
[560] *Id.* at Article 11.
[561] *Id.* article unknown.
[562] *Id.*
[563] *Id.*
[564] Statut de Organisation des Etats Riverains du Senegal [Statute of the Organization of the Senegal Riparian States—OERS], March 24, 1968, signed at Labé, Sen.-Guinea-Mali-Mauritania, United Nations Treaty Series, 1969, No. 9577 Preambular par. 9.
[565] Statut de Organisation des Etats Riverains du Senegal [Statute of the Organization of the Senegal Riparian States—OERS], March 24, 1968, signed at Labé, Sen.-Guinea-Mali-Mauritania, United Nations Treaty Series, 1969, No. 9577 *hereinafter* 1968 OERS Statute.

a view to implementing African unity."[566] With this purpose the OERS harmonizes development plans and coordinates development in the following areas:

- "agriculture and animal husbandry,
- education, training and information,
- public health,
- industrial development,
- transport and telecommunications,
- trade, and
- judicial co-operation and harmonization of civil and commercial legislation."[567]

The institutional structure is expanded to include a Conference of Heads of State and Government, a Council of Ministers and an Inter-Parliamentary Commission. In addition, a Secretariat was created under the Council of Ministers to include an Executive Secretariat and three General Secretariats for Development of the Senegal River Basin, for Planning and Development and for Educational, Cultural and Social Affairs. All decisions of the Conference of Heads of State and Government are binding on the member states.

Parnall and Utton report that the OERS was not effective because its purpose was too broad, it was unable to obtain financing and Guinea, the upper-most state in the basin withdrew from membership.[568]

In 1972 the OERS was formally dissolved with the formation of the Organization for the Development of the River Senegal (l'Organisation pour la mise en valeur du fleuve Sénégal (OMVS)) by the three basin states of Mali, Mauritania and Senegal. Guinea remained an observer to the OMVS. Two Conventions were entered on March 11, 1972 the Statute of the River Senegal[569] which sets forth the principles of cooperation and policies for development and

[566] *Id.* at Art. 1 (4).
[567] 1968 OERS Statute *supra* note __at Art. 1 (2).
[568] Parnall & Utton *supra* note ___.
[569] Convention Relative au Statut du Fleuve Senegal [Convention on the Statute of the River Senegal], March 11, 1972, signed at Nouakchott, Sen-Mali-Mauritania, LEX-FAOC016004, *available at* http://faolex.fao.org, *hereinafter* 1972 Statute.

the Convention Creating the Organization for the Development of the River Senegal[570] which establishes the organs and sets forth the authority and responsibilities of each organ of the OMVS.

Anticipating construction of river works, the three Member States entered the Convention Relating to the Legal Status of Common Works on December 21, 1978.[571] This Convention grants common ownership of river works to each Member State. Included in the Convention are restrictions on state taxation and regulation and provisions for open access. Soon after the Works Convention entered into force construction of two dams began. The Manantali Dam is upstream on the Bafing and the Diama Dam is downstream near Saint Louis, Senegal. The OMVS goals for these two dams were very specific; hydropower of 800 gigawatt-hours per year for nine out of ten years with 1,500 km of transport line to the three member states, increased irrigation in Mauritania and Senegal to 375,000 hectares with two rice crops per year, and a year-round river transportation corridor to Mali.[572] The downstream Diama Dam was developed to prevent salt water intrusion and to create a permanent water body within the River.

Each of the institutions formed throughout the years is founded on the sovereign equality of states. The states within this basin have a synergy of interests that permits development to proceed with a high level of cooperation. The upstream state of Mali is landlocked and needs a transportation corridor to the sea. Mauritania and the other basin states need power and Senegal

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[570] Convention Portant Creation de L'Organsation Pour la Mise en Valeur de Fleuve Senegal [Convention Creating the Organization for the Development of the River Senegal—OMVS], March 11, 1972, signed at Nouakchott modifiée par la Convention portent amendement du 17 novembre 1975, Sen.-Mali-Mauritania, LEX-FAOC016003, *available at* http://faolex.fao.org, *hereinafter* 1972 OMVS Convention.

[571] Convention Conclue Entre le Mali, La Mauritanie et le Senegal Relative au Statut Juridique des Ouvrages Communs [Convention Concluded between Mali, Mauritania and Senegal Relating to the Legal Status of Common Works], Dec. 21, 1978, signed at Bamako, LEX-FAOC016005, *available at* http://faolex.fao.org, *hereinafter* 1978 Works Convention.

[572] SCIENTIFIC DATA FOR DECISION MAKING TOWARD SUSTAINABLE DEVELOPMENT: SENEGAL RIVER BASIN CASE STUDY--SUMMARY OF A WORKSHOP, (National Academy of Sciences 2003)*available online at* http://www.nap.edu/catalog.php?record_id=10546#toc .

and Mauritania are interested in increased irrigation. All states were motivated by the desperate food shortages resulting from the drought during the 1970s. The level of cooperation and river basin institutions are lauded as exemplary by international legal scholars.[573]

Problems Associated with Basin

Manantali Dam became operational in 1986 and Diama Dam was completed in 1988.[574] Soon thereafter the riverine population within the lower basin faced devastating consequences. The increase in water borne disease and the influx of invasive species may not have been able to be anticipated however, the impact on the existing local uses of the river were given inadequate consideration during the planning for river development and little consideration in the operation of the dams.[575]

The local riverine population in Senegal and Mauritania practiced recession agriculture for centuries. During the rainy season the lands within the flood plain were inundated. As the water receded cereal crops were planted in the moist and nutrient rich soil. The people moved to higher ground where the acacia trees provided wood for shelter and charcoal and the livestock browsed on native vegetation. They returned to the river for fishing and to harvest the crops. The livestock then fed on the plant stubble. This annual cycle was disrupted by dam construction and clearing to expand irrigated agriculture.[576]

Reports indicate that the operational plans for the dams included an annual release to simulate the rainy season floods however, this did not occur.[577] Some years there was not a

[573] *See* Parnall & Utton and ILC Third Report *supra* note ____.
[574] Newton *supra* note ___.
[575] CODATA *supra* note ___; *see* Vick *supra* note ___, 216-219.
[576] US AID, *The Future of the Senegal River Basin: Making the Right Decisions Now* (May 28, 2003) *available* at http://rmportal.net/library/files/srbpamphlet.pdf/view?searchterm=None .
[577] *Id.*

release and at other times releases occurred at times that destroyed seedling crops.[578] In addition the acacia forests were cleared for expanded rice planting. Most of the livestock died without the feed provided by the stubble from the cereal crops or became weakened and unable to withstand the parasites. Native fish populations were destroyed without access to the sea for spawning. The people suffered a devastating increase in water boarne diseases. Nearly all aspects of local water use within the flood plain were destroyed.[579]

In response to these negative consequences the OMVS established environmental monitoring through the Programme d'Atténuation et de Suivi des Impacts sur l'Environnement (PASIE). The results from PASIE and from independent studies led OMVS to the adoption of a Water Charter in 2002.

2002 Water Charter

The 2002 Water Charter [580] incorporates the latest concepts of international water law in a manner consistent with the history institutional development of the basin. The Preamble recites the historic documents relevant to the Member States and the regulation of the river beginning with the Charter of the United Nations and the Constitutive Act of the African Union and including the basin Conventions and management agreements. The Preamble states that the Member States are conscious of customary international law regarding utilization of an

[578] *Id.*
[579] U.N. World Water Assessment Programme for Development, WATER FOR PEOPLE, WATER FOR LIFE, *Senegal River Basin, Guinea, Mali, Mauritania, Senegal,* Chapter 20 (2003) *available* at www.unesco.org/water/wwap.
[580] Adopted as Resolution No. 005 by the Conference of Heads of State and Government of OMVS and ratified by each OMVS state according to their Constitutions. Guinea joined OMVS by Treaty of Accession March 2006. Guinea is listed as a member state on the OMVS web site, http://www.omvs-soe.org/indexp.htm. S*ee also,* UNDP-GEF, *International Waters Programme, Delivering Results* 14-15 (2007) *available at http://www.undp.org/gef/documents/publications/IW_deliveringresults.pdf* .

international watercourse and the principles of the 1997 UN Convention and the 1992 Rio Declaration.[581]

Building on the OMVS management of the river, the 2002 Water Charter allocates water among sectors, not among states. The cooperation of the basin states was established in 1963 and the river works relinquished to common ownership in 1978 making allocations to states incongruous with the basin history. The principle of equitable utilization is incorporated in the 2002 Water Charter but in the context of utilization by sectors. Article 8 provides that the water resource will be used in an equitable manner to satisfy not the needs of the respective states but the potable water needs of the population, the needs of agriculture, energy production, industry and navigation.

Article 3 provides the following general principles for distributing water:

- "the obligation to guarantee a balanced management of the water resource;
- the equitable and reasonable use of the River's water;
- the obligation to preserve the environment;
- the obligation to negotiate in case of conflict;
- the obligation of each riparian State to inform other riparian States before engaging in any activity or project likely to have an impact on water availability and/or the possibility to implement future projects."[582]

The objectives go on to state that the guiding principles will "guarantee to the populations…the full pleasure of the resource, with respect to the safety of the people and the works, as well as the basic human right to clean water, in the perspective of sustainable development."[583]

Article 5 establishes principles for the allocation of water among the sectors relying upon the river. These principles include broad concepts of cooperation, security, prevention of flight

[581] Declaration on Environment and Development, June 13, 1992, Rio de Janeiro, U.N. Doc. A/CONF.151/26; 31 I.L.M.874 (1992) hereinafter 1992 Rio Declaration.
[582] 2002 Water Charter *supra* note ___Art. 4.
[583] *Id.*

from rural areas, food security, and strengthening economies against climatic variations. The principles of integrated water resource management are also incorporated in Article 5. The specifics of water allocation among the sectors are contained in Annexes to the Water Charter which may be revised at a technical level to meet changing conditions.[584]

Part 4 beginning with Article 16 provides for the protection and preservation of the River's ecosystems. The contracting States commit to protect the resources through national legislation and jointly through the OMVS. In addition "[T]hey will take measures to prevent, reduce or control events or conditions resulting from natural disasters or human activities likely to harm other States, the environment of the river and human health or safety."[585]

The protection of the population and establishing the priority of water for vital human needs[586] are significant contributions of the Water Charter. However, the opportunity for public participation remains limited. Article 23 provides that the status of "observer" may be accorded to representatives of users, local communities, non-governmental organizations and decentralized management committees. The process of obtaining "observer" status requires a recommendation from the High Commission and action by the Council of Ministers. The "observer" may then attend meetings of the Permanent Water Commission.

Conclusion

The institutions of the Senegal River Basin are remarkable for their cooperation and advancement of international water law. They are top down institutions negotiated at the highest levels of government with goals to serve the state governments. There were devastating and irreversible consequences at the local level. The 2002 Water Charter takes significant steps to incorporate the needs of the local populations dependent on the Senegal River within the

[584] *Id.* at Art. 15.
[585] *Id.* at Art. 16.
[586] *Id.* at Art.

operational principles and management goals yet lacks a regularized system for local stakeholder participation in basin decision making.

The cooperation established in the first institution in 1963 formed the basis for continuing communication, exchange of data and cooperation through multiple agreements leading to the 2002 Water charter. The basin institutions provide a forum for broad discussions about development within the basin. With the accession of Guinea to the OMVS and the agreements in the 2002 Water Charter all basin states are once again bound together by the legal instruments which provide the mechanisms to adapt to a changing future.

Chapter Ten: Utton Center Model Interstate Water Compact

The Utton Transboundary Resources Center[587] published a Model Interstate Water Compact[588] in October, 2006 following three years of collaboration among the leading academics and practitioners of transboundary water law.[589] The model compact was developed to "be used as the basis for forging agreements between states regarding their shared water resources and for dealing with issues not considered in current compacts."[590] These issues include coordination of water quality for the watercourse among all the basin states, alternatives to litigation for dispute resolution, and an apportionment of water for ecological and environmental purposes.

> The principal purpose of the Model Compact is to respond to the Supreme Court's repeated admonition to contesting states that the negotiation of their respective 'equitable shares' of interstate regional water resources and resolution of other disputes regarding such resources is a far better approach than a judicially imposed 'equitable apportionment' or other judicial decree.[591] (citations omitted).

To accomplish this purpose the Model Compact recognizes in the Preamble the realities of interstate waters within the United States. The concepts, however, are equally applicable to international watercourses.

- The water resources "are or may become valuable for a variety of beneficial purposes;"
- The "optimum use and protection of the Basin's water related values" are best realized by a basin wide approach;
- The "equitable sharing and sustainable management of the Basin's water resources can best be accomplished and equitably adjusted when necessary by the Basin states jointly by agreement;"

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[587] University of New Mexico School of Law
[588] Jerome C. Muys, et al, *Utton Transboundary Resources Center Model Interstate Water Compact* 47 Nat. Resources J. 17 (2007). , *also available at* http://uttoncenter.unm.edu/pdfs/Model_Compact.pdf, last visited June, 2009, hereinafter Model Compact.
[589] For information about this process and the list of advisers, committees and review see, http://uttoncenter.unm.edu/model_compacts.html, last visited Oct. 21, 2006.
[590] *Id*.
[591] Model Compact *supra* note __, Art. I cmt., 47 Nat. Resources J. at 27.

- The "need for integrated, adaptive water resource management, specifically the need for management decisions affecting the watershed to be made at the watershed level" is critical "to the sustainable management of the water resources of the …Basin;" and
- Development projects and water management programs "should be consistent with regional water resource management programs."[592]

Given these goals and purposes the Model Compact apportions water among uses, among users, and among states. The apportionment scheme is discussed below.

Apportionment

The "first cut" of water is for ecosystem protection and preservation.[593] The parties agree to set forth in an annex the amounts of water required for the different reaches of the watercourse during different seasons to "maintain a healthy and productive Basinwide ecosystem."[594] For watercourses within the United States this water is primarily to satisfy the habitat protection requirements of the Endangered Species Act.[595]

The next allocation of water is to "satisfy the use requirements of all perfected water rights derived from federal, state or tribal law."[596] The Model Compact does not allocate water to particular users, but apportions the water among the states in sufficient amounts to satisfy the "perfected water rights" within each state. A "perfected water right" is one which is "acquired in accordance with state law which has been exercised by the actual diversion and/or beneficial use of a specific quantity of water in accordance with state law…."[597] These rights together with water for ecosystem preservation determine the base apportionment to each state. The amount is

[592] *Id.,* Compact Preamble, 47 Nat. Resources J at 24.
[593] *Id*, Art. V cmt. 47 Nat. Resources J at 64..
[594] *Id.,* Art. V(A), 47 Nat. Resources J at 59.
[595] 16 USC §§1531-1544.
[596] Model Compact *supra* note Art. V(A), 47 Nat. Resources J at 59.
[597] *Id.,* Art. III(I), 47 Nat. Resources J at 37. This definition also considers reserved rights under federal common law that are not acquired in accordance with state law.

then converted to percentages of flow volumes.[598] Percentages were selected for the ease in measurement and monitoring and the ease with which reductions may be made during times of shortages of supply.

The volume necessary to satisfy the base apportionment may exceed the available supply of the watercourse, a condition of "over appropriation." The Commentary addresses this issue by stating that the method developed to apportion the waters during years of shortage should be looked to as guidance for the negotiators of a compact under these conditions.[599] In these conditions the water is apportioned by a commission using the percentages determined by the ratio of ecosystem and perfected rights for each state. The apportionment to each state is reduced if the "safe annual yield" is less than average. Intrastate allocation of each state's share is determined by the state, i.e. state law is used to allocate water among each of the holders of perfected rights. This seems straight forward, however, during shortage conditions, it is likely that a market will develop for intra- and inter-state transfers.

The volume necessary to satisfy base apportionments may be less than the supply of the basin. In this circumstance the commentary suggests several alternative allocation methods that the negotiators may decide upon. These include dividing the water according to the percentage shares for base apportionments, giving each state the same volumetric amount, or authorizing the Commission established by the Compact to allocate the water using criteria agreed upon.[600]

The final allocation is of "supplemental" waters. The Model Compact includes a calculation of estimated safe annual yield, which is defined as "the amount of water that can be withdrawn annually from a surface or sub-surface water resource without serious water quality,

[598] *Id.,* Art. V cmt 47 Nat. Resources J at 65.,
[599] *Id.,* Art. V cmt, 47 Nat. Resources J at 67.
[600] *Id.,* Art. V cmt, 47 Nat. Resources J at 65.

net storage, environmental or social consequences."[601] This is calculated using an analysis of the average annual and seasonal flows on record, the wettest 10 year period and the driest 10 year period. The Commission determines the amount of water "reasonably likely to be available" for a five year period and determines the amount above the base apportionment, ecosystem preservation and perfected water rights, and makes supplemental apportionments. The supplemental apportionments are made on a five year term and are subject to renewal.

The measure for all uses within the basin is "reasonable beneficial use." Few states within the United States have enforced a standard for water use that limits quantity for right's holders, however, as demand continues to increase this standard will play an increasing role in water management. It is a flexible and adaptive standard incorporating both the amount of water in the term "reasonable" and the use of that water within the term "beneficial." "The authors [of the Model Compact] are convinced that the principal long-term source of 'new' water for expanding populations and environmental values will come from increased conservation efforts. A major component of this effort must necessarily be more aggressive enforcement of a clearly defined reasonable beneficial use standard."[602]

The group of scholars and practitioners who developed the Model Compact determined that multiple methods of apportionment were needed to meet the varied utilization of an interstate stream. Ecosystem preservation and existing uses are protected with base apportionments that are quantified and then converted to percentages of the estimated safe annual yield. Supplemental apportionments are based on hydrological data and subject to conditions imposed by the Commission which may include conservation requirements and payment of a market value for the water. All uses within the states in the basin are limited to

[601] *Id.,* Art. III(K), 47 Nat. Resources J at 38.
[602] *Id.,* Art. V(G)cmt, 47 Nat. Resources J at 73.

reasonable beneficial use with a mechanism to enforce rules against waste, unreasonable, or unbeneficial uses. The Model Agreement also permits marketing the apportionments among the basin states as a means of achieving flexibility to meet changing circumstances.[603]

Institutions

The Model Compact calls for the formation of a Commission to implement, supervise and enforce the provisions of the Compact among the states.[604] The Commission members are the highest elected officials of each basin state or their representatives. The authority of the Commission is very broad. The Commentary explains that all possible functions are included with the intent that particular basins will tailor the authorities to meet the particular basin needs. The Commission duties are to "exercise final authority and responsibility for (a) the equitable, efficient, and sustainable

use of the water apportionments; (b) the management of the water quality programs under this Compact; and (c) the management of the water resources programs under this Compact."

The Commission is supported by a Council of two high ranking water management and water quality officials from each state, two tribal representatives and two federal representatives. The Council has the primary responsibility for approving water allocations and water quality programs at the state level.

The Commission and the Council are supported by a Division of Scientific Analysis. The Division is composed of an equal number of representatives from each state with technical expertise in water management, water quality, economics, fish and wildlife and other matters of importance to the management of the Basin.[605]

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[603] Model Compact Art. V cmt, 47 Nat. Resources J at 64-75. at 44-58. The Model Compact also includes provisions for maintaining the water quality of the basin. *See, Id.,* Art. VI, 47 Nat. Resources J at 76.
[604] Model Compact Art. IV (A), 47 Nat. Resources J at 41.
[605] Model Compact *supra* note __ Art. IV (D), 47 Nat. Resources J at 53.

This structure is explained in the Commentary as vesting decision making authority with the elected officials of the basin governments. The Council consists of the agency heads from basin governments and is responsible for policy decisions. The Science Division has equal authority to the Council over scientific and technical issues in order to implement the agreed upon policies.

Conclusion

The Model Compact is included in this discussion for its comprehensive treatment of transboundary water issues. The group of experts who drafted and commented on the Model Compact brought varied and extensive experience to its development. It is as comprehensive a management tool as can be designed. It is geared toward future development while protecting existing uses. Unlike existing compacts within the United States, it includes the tribal governments within the basin and the United States. Its provisions are worthy of study and consideration any transboundary agreement.

Chapter Eleven: Three International Watercourses without Agreements

Three international watercourses without basin-wide agreements are examined in this section: the Nile, Amu Darya/Syr Darya, and the Tigris/Euphrates. [606] The examination uses four criteria; 1) communication among the basin states, 2) data gathering and exchange of information, 3) common goals and agreement on management principles and 4) the institutional authority and capacity to implement basin goals and management principles.

The four criteria are hierarchical in that communication is the platform upon which the states may exchange data and information. The data and information about the basin are essential to setting common goals and management principles. Any basin institutions use these to achieve management flexibility.

Nile

The Nile is one of the most famous rivers in the world. It forms a basin of approximately 1,170,000 square miles (3,030,286 km^2).[607] It is comprised of the Blue Nile with headwaters in Eritria and Ethiopia and the White Nile with headwaters historically thought to be Lake Victoria but now considered the Kagera River whose headwaters are in Burundi. The two branches have very different characteristics and flow patterns before joining in a confluence in Khartoum, Sudan. The Nile then flows through Sudan and Egypt before forming the large delta region at the Mediterranean.

[606] This section is based on *Living with Change in Transnational Basins: Some Typical Cases,* Malin Falkenmark, Margaret Vick, & Charlotte de Fraiture publication forthcoming.
[607] Stephen C. McCaffrey , THE LAW OF INTERNATIONAL WATERCOURSES 258 (2007).

The states within the Nile basin are parties to numerous agreements. Of note are the agreement in 1929 between Egypt and Great Britain/Sudan[608] and the 1959[609] agreement between Egypt and Sudan dividing the waters of the Nile;[610] and the more recent agreements for management of the Kagera River basin[611] and for the coordinated and sustainable management of Lake Victoria.[612]

Egypt is the dominate state within the basin having used the waters of the Nile for irrigation for an estimated 5000 years. Experts anticipate that the population in the basin may increase by 100% during the next 50 years further increasing the water stress within the basin.[613] The upstream states are looking forward to future development of the Nile while the downstream states are interested in protecting existing development and looking forward to expanding development to meet future needs. This creates a situation where the upstream states view water security as the ability to meet development potential and the more highly developed downstream states view water security as the protection of existing uses and the recognition of prior agreements.

It has been said that nothing flows among the Nile basin states except water.[614] This truism is no longer valid though linkages of trade and transportation among the basin states

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[608] Exchanges of Notes between the U.K. and Egypt in regard to the Use of the Waters of the River Nile for Irrigation Purposes, Cairo, May 7, 1929, 93 L.N.T.S. pg. 44.

[609] Agreement between the United Arab Republic and the Republic of Sudan for the Full Utilization of the Nile Waters, Cairo, Nov. 8, 1959, 453 U.N.T.S. 51.

[610] *See* McCaffrey 2007 *supra* note __, 263 and ROBERT O. COLLINS, THE NILE (2002) for a discussion of these early agreements.

[611] 1977 and 1981 Agreements

[612] Agreement to Initiate Program to Strengthen Regional Coordination in Management of Resources of Lake Victoria, 5 August 1994, Kenya, Tanzania, United Republic of Uganda, *Transboundary Freshwater Dispute Database* available at http://ocid.nacse.org/tfdd/treaties.php , East African Community, Protocol for Sustainable Development of Lake Victoria Basin, signed Nov. 29, 2003, effective July 2005, Republic of Kenya, Republic of Uganda and the United Republic of Tanzania available at http://www.ecolex.org/ecolex/ledge/view/RecordDetails;DIDPFDSI?id=TRE-002034&index=treaties.

[613] Falkenmark *supra* note __.

[614] Regional Saying.

remain limited. Communication and the exchange of water data within the basin now occur on a regular basis through the efforts of the Water Ministers of the Nile basin states.

Communication among the Nile Basin states began at the technical level through the Hydrometeorological Survey of the Catchments of lakes Victoria, Kyoga and Albert (Hydromet) (1967-1992). Hydromet was succeeded by the Technical Cooperation Committee for the Promotion of the Development and Environmental Protection of the Nile Basin (TECCONILE) (1992-1999). A Council of [Water] Ministers of 9 of the 10 basin states formed the Nile Basin Initiative (NBI) which continues the work of the TECCONILE.[615]

The NBI developed a shared vision "[t]o achieve sustainable socio-economic development through the equitable utilization of, and benefit from, the common Nile Basin water resources." Creation of a shared vision was a major undertaking. It provides agreed upon common goals and principles for management of the basin. The states agree that socio-economic development must be sustainable, that the states are to equitably utilize the water resources and equitably utilize the benefits of the water resources which are common to the basin states.

The Shared Vision is implemented through cooperative programs, stakeholder involvement and education. The Council of Ministers agreed upon the complete text of a Cooperative Framework Agreement, a basin-wide Cooperative Framework.[616] However, Egypt maintains that a provision regarding historical uses remain in the text of the Cooperative Framework Agreement. The Ministers from the other states agreed to address the issue at a later time in an annex. With this most recent action the Cooperative Framework is before the governments of the basin states for consideration.

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[615] McCaffrey 2007, *supra* note __, 271-272.

[616] This agreement does not include Egypt and the representative of Sudan was not present at the meeting where this action was taken. *Positive steps towards Establishing a Permanent River Basin Commission*, NBI News, *available at* http://www.nilebasin.org/index.php?option=com_content&task=view&id=131&Itemid=1 .

Common goals are articulated by the NBI at a project specific level but the principles for addressing future water scarcity created by population growth, climate change, and demand for increased food production have not been addressed. The NBI does not have the requisite authority to address change until the states enter a basin-wide agreement which vests such authority.[617]

Amu Darya/Syr Darya

The Amu Darya and Syr Darya feed the Aral Sea. The Amu Darya enters the southern Aral Sea after flowing 1490 miles (2400 km) from the headwaters Vakhsh and Panj Rivers in Tajikistan and Kyrgystan.[618] The Syr Darya rises in the mountains of Kyrgystan and flows1550 miles (2500km) through the Central Asian countries of Tajikistan, Usbekistan and Kazakhstan. Most of the time water from the Amu Darya and the Syr Darya does not reach the Aral Sea creating what has been described as the world's worst environmental disaster.[619]

Most of the current development within the Amu Darya/Syr Darya basin occurred when the region was part of the former Soviet Union. The break-up of the Soviet Union and the formation of separate states resulted in concentrated development in upstream states and the consequences of that development felt as environmental and economic harm in the downstream states. Population growth during the next 50 years is projected to be much greater upstream exacerbating the upstream-downstream disparities and water stress.[620]

The post-Soviet states within the basin entered the first agreement regarding water in 1992. This agreement recognized and confirmed the legal status of water allocations as they

[617] Since 1959 the basin states have entered several agreements for limited purposes. McCaffrey 2007 *supra* note __, 271-272
[618] McCaffrey 2007 *supra* note __, at 275-276.
[619] Aaron T. Wold & Joshua T. Newton, *Case Study of Transboundary Dispute Resolution: Aral Sea, available at* http:///www.transboundarywaters.orst.edu/research/case_studies/Aral_Sea_New.htm
[620] Falkenmark, *supra* note __.

existed under the Soviet regime[621] and created the Interstate Commission for Water Coordination (ICWC) to manage transboundary waters and assume the responsibilities from the former Ministry of Water Resources of the USSR.[622] The ICWC continues the policies of the Soviet Basin Water Organizations for Amu Darya and Syr Darya. Numerous other institutions and organizations have been established to address the environmental crisis of the Aral Sea. These organizations provide opportunities for communication and data exchange and for sharing information about the operation of existing works but do not address management of the basin.

The basin states have not agreed upon common goals or principles for water use. Each state developed water laws reflective of their upstream or downstream position and in support of the major water sectors within their respective territories.[623] The existing institutions do not have the authority to change water use within any state or to change the regulation of works on the international waters. These remain in the management of individual states or private and sectoral groups. Regional economics and markets for water remain major issues preventing agreement among basin states.

Euphrates/Tigris

The Euphrates and Tigris Rivers both originate in Turkey join at the Shatt-al-Arab waterway a short distance before flowing into the Persian Gulf. The Tigris forms the border between Turkey and Syria before flowing through Iraq where it receives a contribution of water from the Kuran River which originates in Iran. The Euphrates River also originates in Turkey

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[621] A.D. Ryabtsev, *10 Years of Regional Collaboration in Shared Water Resources Management of Central Asia,* prepared for 3rd World Water Forum, Regional Cooperation in Shared Water Resources in Central Asia, Kyoto, March 18, 2003 available at www.adb.org/Documents/Presentations/RC_Shared_Water/Ryabtsev.pdf .

[622] VICTOR DUKHOVNY & VADIM SOKOLOV, LESSONS ON COOPERATION BUILDING TO MANAGE WATER CONFLICTS IN THE ARAL SEA BASIN, UNESCO, IHP, WWAP IHP-VI Technical Documents in Hydrology PC CP series no. 11 (2003), Victor Dukhovny & Vadim Sokolov, *Water Resrouces Management Strategy for the Aral Sea Basin: Problems in Preparation, available at* http://oieau.fr/ciedd/contributions/at2/contribution/sokolov.htm .

[623] *Id.*

and flows south through Syria and Iraq. The region is characterized by war and political struggle at this time of political occupation of Iraq by the United States, Kurdish efforts at independence from Iraq and Turkey and Syrian conflict with its neighbours.

The upstream state of Turkey is the water hegemon in the basin with control of large multipurpose dams and plans for more works as part of the Southeastern Anatolia Project (GAP). These projects include the Ataturk Dam, the ninth largest in the world[624]and the Birecik Dam.

Turkey customarily provides notice to downstream states that major works are underway, but there is not cooperation or coordination for planned measures and water diversions that impact the entire basin. The lack of cooperation led to several water related crisis including complete cessation of the flow of the Euphrates River to fill Ataturk Reservoir[625] and formal objections lodged by both Syria and Iraq to construction of Birecik dam.

Several decades ago the states within the basin participated in discussions. The first technical meeting among the major basin states of Turkey, Syria and Iraq was held in 1965 to discuss dam construction and operation. From 1965 until *circa* 1992 a Joint Technical Committee (JTC) met to exchange data and to develop a tripartite river basin agreement. In 1992, when an agreement had not been reached, the JTC discontinued meeting. At this time, there is not a regularized exchange of basic data on precipitation, water use, or water quality. Recent news reports indicate this may be changing. Regional newspapers reported that 18 representatives from Turkey, Syria and Iraq held a technical meeting of in March 2008 for the purpose of forming a basin water institute.[626]

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[624] McCaffrey 2007 *supra* note __at 325.
[625] A. Kibaroglu, A.& I.H. Ünver *An Institutional Framework for Facilitating Cooperation in the Euphrates-Tigris River Basin,* 5 International Negotiation 311 (2000).
[626] *Ercan Yavuz, Turkey, Iraq, Syria to Initiate Water Talks, Today's Zaman,* March 12, 2008 available at www.todayszaman.com/tz-web/detaylar.do?load=print&link=136183&yazarAd=.

Major construction continues within the basin without an agreement among the states. The states have different views on basic principles. Turkey asserts sovereign rights to develop water resources within its territory[627] and has claimed that the Euphrates and Tigris are not international rivers because neither forms a boundary between two states.[628] In addition, Turkey considers the Euphrates and Tigris to be one watercourse system and requires that negotiation address the entire basin.

On the other hand, Iraq and Syria have asserted that the Euphrates and the Tigris should be treated as separate rivers for purpose of negotiations. Iraq and Syria assert rights to volumetric allocations and want "guaranteed" delivery downstream. If these basic differences are not sufficient to foreclose an agreement, negotiators have linked Kurdish separatists activities with the water negotiations further increasing distrust among the states.[629]

The reports of formation of a basin water institute are encouraging in that the states are communicating. We do not know if the water institute will come to fruition providing a regular mechanism for communication, data gathering and exchange of information.

Conclusion

The three basins discussed herein, are examples of the many basins throughout the world without basin-wide agreements. As we face water stress from increased population and increased standards of living which require increased water for food production we must work to allocate water resources carefully and according to agreed upon goals and principles. It may sound simple, but as is illustrated in the Euphrates/Tigris basin, communication is the first step and not as easy as it sounds.

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[627] M. Rende *The Global Water Shortage and Turkey's Water Management,* Proceedings of the Symposium by the Regional Centre on Urban Water Management, Policies and strategic options for water management in the Islamic countries, Tehran 15 -16 December 2003, UNESCO Technical Documents in Hydrology/No. 73 (2003).
[628] Kibaroglu & Ünver 2000
[629] McCaffrey 2007, *supra* note __, 328.

The agreements among the Senegal basin states offer examples of the introduction of key water sharing principles in incremental steps. The first agreement in 1963 included broad development goals and established a basin-wide institution. It is through this institution that communication and data sharing took place to permit cooperation for the development of the multi-purpose dams for the benefit of all states. Different organizational structures and different development principles were adopted over a period of 40 years culminating in the 2002 Water Charter. It is the spirit of cooperation among the states based on an early identification of shared benefits that permits the institutions to develop along with the river resources.

The Amu/Syr Darya basin is dominated by upstream irrigation interests creating ecological damage and water shortages downstream. The Senegal Basin agreements may offer guidance in this basin as well. The water sharing arrangement in the Senegal is based on use by sectors, not a division among states. If sector allocations are agreed upon a provision permitting an analysis of reasonableness is needed. The 1997 UN Convention provides at Article 5 that states shall use an international watercourse in "an equitable and reasonable manner" with a "view to attaining optimal and sustainable utilization and benefits therefrom."[630]The Model Compact requires states to enforce a standard of "reasonable beneficial use" of its apportionment from the transboundary resource. This is defined as "the application of water to a beneficial use in an amount reasonably necessary to satisfy such use…."[631] The Commission created under the Model Compact has the authority to reduce the state apportionment in the event of a finding that the state is not enforcing this standard.[632] This standard has been in effect in the United States since the passage of the Reclamation Act of 1902 and though there has not been significant

[630] 1997 UN Convention *supra* note__, Art. 5(1).
[631] Model Compact, *supra* note __, 47 Nat. Resources J at 38,at Art. III (J).
[632] *Id.,* Art. V(H), 47 Nat. Resources J. at 62-63.

enforcement, it is a widely recognized standard.[633] It is a standard such as this, and the authority to enforce it, that will create water savings and conservation within a basin such as the Amu/Syr Darya that is over-appropriated.

Recent reports from the Tigris/Euphrates basin indicate an increased willingness to share technical information. The upstream hegemonic position of Turkey makes them a critical participant in negotiations. There are sub-basin bilateral agreements among the states which may provide a starting point for negotiations. The GAP Ministry in Turkey and the Irrigation Ministry in Syria entered an agreement in 2001 for training and exchange of experts. Iran and Iraq entered an Agreement in 1975 regarding the use of Frontier Watercourses. Turkey and Iraq signed an agreement in 1946 with provisions relative to the regulation of the Tigris and Euphrates and tributaries. Within the Colorado River basin the "bilateral agreement" between Colorado and New Mexico for the La Plata River, a small tributary, is incorporated within the Upper Basin Compact without upsetting the allocations and management regime established 20 years previously.[634]

A different circumstance is presented in the Nile Basin. Two historic agreements to which Egypt is a party present circumstances upon which the basin states cannot agree. An exchange of notes in 1929 between Egypt and the Great Britain provide that use of the waters of the Nile shall not "infringe Egypt's natural and historical rights in the waters of the Nile and its requirements of agricultural extension."[635] In 1959 Egypt and Sudan entered an agreement to fully utilize the waters of the Nile and to agree on a unified position in negotiations over the Nile

[633] *Id.,* Art V(G)cmt., 47 Nat. Resources J. at 73-75.
[634] Upper Colorado Basin Compact, Art. *supra* note __.
[635] Exchanges of Notes between the U.K. and Egypt in regard to the Use of the Waters of the River Nile for Irrigation Purposes, Cairo, May 7, 1929, 93 L.N.T.S. pg. 44.

waters.[636] Unlike the tributary agreements within the Colorado River basin and the bilateral agreements on the Tigris/Euphrates Rivers, the 1959 agreement regarding the Nile allocates the full flow of the river between the two states. To give this agreement full effect arguably prevents development in other basin states. During the negotiations for a Cooperative Framework Agreement it is the treatment of "historic" agreements that creates a conflict among the states. The law of treaties and the succession of states all become involved in these discussions. At the meeting of the Council of Water Ministers on May 22, 2009 the Ministers reached agreement on the text of the Cooperative Framework Agreement except for the provisions relating historic rights and uses.[637]

The Model Compact contains provisions for the protection of existing uses, however, this assumes that the basin is not yet over-allocated or in extreme water stress like the Nile basin. Egypt is the hegemonic state within the Nile Basin and appears to be forcing the other basin states to proceed without their participation. The resolution of the issue of historic agreements may be resolved through judicial or other means.

Conclusion to Part III

The simplest things may be the most effective for basin-wide management: communication, coordinating watercourse data and the exchange of information on water and land use. Yet it is this information that may be difficult for states to disclose even though it is critical to basin-wide equitable and reasonable utilization. Through negotiated agreements

[636] Agreement between the United Arab Republic and the Republic of Sudan for the Full Utilization of the Nile Waters, Cairo, Nov. 8, 1959, 453 U.N.T.S. 51.
[637] *Positive steps towards Establishing a Permanent River Basin Commission,* Nile Basin Initiative, available at http://www.nilebasin.org/index.php?option=com_content&task=view&id=131&Itemid=1 .

institutions may be formed which provide a regular and routine forum for communication and exchange of information.

Agreements and institutions may be as complex as those governing the Colorado River or as progressive in their ownership of river works as the OMVS in the Senegal basin or still in the formative stages as in the Nile Basin. However, basin-wide institutions are key to avoidance of environmental catastrophe and adjusting to changing natural and human conditions.

The legal structure of the Colorado River basin and that of the Senegal Basin offer interesting contrasts. Within the Colorado system most local water uses are based on the principle of prior appropriation which is incorporated into state law. More recently reserved rights for federal lands including those held in trust for Indian tribes have been quantified and incorporated within the federal management of the main stream and the state management of local water uses. In the Colorado system the states and the federal government negotiated volumetric allocations of water with general principles for the allocation of surplus water and adjusted allocations in times of shortage. It is these general principles that have been called upon to adapt to change within the basin. The technical institution for river management, the federal Bureau of Reclamation, developed in cooperation with the states, criteria for water allocation when the volume of water is not sufficient to meet the volumetric allocations. This process included opportunities for participation by all users and stakeholders within the portion of the basin affected by shortages. The participation took place not under the provisions of any water agreement but under the requirements of a different federal law, the National Environmental Policy Act (NEPA)[638] which mandates that an environmental impact statement be prepared for major federal actions. It is the NEPA requirements that brought stakeholders and the public into the decision making process.

[638] 42 U.S.C. §4321 et seq.

The Colorado Basin is over-allocated with each user having a stake in its management. Adoption of the shortage criteria was the result of extensive data collection and years of negotiations among the basin states and major stakeholders. It was precipitated by a common understanding of the necessity for a change in river management to meet the changed circumstances of drought within the basin.

The Senegal Basin presents a different set of circumstances and a different response. In 1963 the top levels of government of the basin states viewed the River as a path to development. The concepts of what to do were accepted early, hydropower production, increased irrigation and navigation, and the institutions were formed to accomplish these goals. As the governments developed so did the institutions and this is reflected in the sequence of basin agreements. The adverse consequences of dam development are not unique to the Senegal River. What was unique was the fact that this occurred in the late twentieth century and not the nineteenth century and that the negative consequences came close to defeating the basin development goals. The effect of having an existing institution for data collection and cooperation resulted in the PASIE data gathering and the changes made through the 2002 Water Charter which incorporates the latest developments in management of international watercourses.

Within the Senegal Basin the local water uses were not protected by law and not given consideration when "bigger and better" plans for the watercourse were developed at the top levels of government. At the time of dam construction the local users did not have a voice. The consequences had an impact back up to the states in decreased food production, displaced population, food scarcity and increased disease. These remain major concerns within the basin ten years after dam construction. The strength and support of the basin institutions provide a process to address the devastation cooperatively and the capacity to implement change.

The basins without basin agreements are at various stages of cooperation and negotiations. The role of users and local laws and the sustainability of the watercourse as a natural system must be included in the international negotiations. The 1997 UN Convention and the Model Compact are a starting points.

Overall Conclusion

Water law may be viewed as the set of rules for human interaction with the hydrologic cycle. Water law promotes the particular policies in place at the time the laws are developed. Water laws that develop at the local level, from the bottom up, were examined in Part One. These include prior appropriation which promotes settlement and irrigation of arid lands:[639] *acequias* promoting community development,[640] and *subaks*[641] supporting food production and cultural cohesiveness. Water law includes customs such as those by which the *mayordomo* opens the headgates in New Mexico and the rice societies that encourage and support cultivation and prayer in Bali and Sri Lanka. Water law includes the statutes and regulations adopted at multiple levels of government to promote, limit, and protect water uses. These laws reflect the preferences of the societies in which they develop.

Water law also includes compacts and treaties entered at the highest levels of government in order to utilize transboundary waters, resolve conflicts, and promote goodwill. This body of law includes the international principles that have crystallized as customary international law binding on all states. Each level of water law is applied to the same watercourse at the same time. It is the duty of water planners, water managers, and the negotiators of watercourse agreements to know and understand the plurality of laws that simultaneously regulate a single source of water.

[639] *See* Chapter 1 *supra* at 14.
[640] *Id.* at 17.
[641] *Id.* at 24.

Effective domestic water institutions are as important to managing an international watercourse as are the basin institutions among states. A basin-wide treaty is only effective if all users adhere to it.

This dissertation explores water law at the bottom and at the top of a legal pluralistic system. Each water use and each water law within a hydrologic basin affects all others. One cannot forget local laws when negotiating an international agreement and one cannot ignore international agreements when allocating local resources. All must be integrated within a management system in order to obtain optimal and sustainable development of hydraulic basins for our welfare and survival.

How can this occur? First, the sooner water sharing institutions are established and water sharing agreements negotiated the better are the chances of resolving or preventing international water disputes. The OMVS in the Senegal Basin demonstrates that new data, changing circumstances and unintended consequences may be resolved through existing institutions.[642]

Second, strong domestic institutions help address change. The basin institution regulating the Colorado River is addressing drought and climate change by adopting shortage criteria for operations in the lower basin.[643] Third, the effectiveness of an institution is determined by the extent of its authority. The International Boundary and Water Commission created by the United States and Mexico has broad decision making authority absent objection by the State Parties. However, these institutions do not have authority to regulate water users.

One intra-state dispute between a state official and water users illustrates the complexity of integrating water law among interstate agreements, institutions, and users.

[642] *See* Chapter 9 *supra* at 164.
[643] *See* Chapter 8 *supra* at 160.

Hinderlider v. La Plata River & Cherry Creek Ditch Company[644]

Hinderlider involves a dispute between an irrigation company and the Colorado State Engineer over use of the La Plata River. M.C. Hinderlider is the Colorado State Engineer charged with administering the waters of the state and with administering the terms of the La Plata River Compact with the state of New Mexico. The plaintiffs are corporate owners of a ditch used to divert water to irrigate land in southern Colorado. The La Plata River is a small watershed which originates in the mountains of southwestern Colorado and flows south into New Mexico before joining the San Juan River near Farmington, New Mexico[645] which then flows into the Colorado River. The flow is dependent on snowmelt from the La Plata Mountains in Colorado[646] and fluctuates between high flows in the spring and low flows in the late summer and fall.

In 1922 the states of Colorado and New Mexico entered the La Plata River Compact which apportions the water using three different mechanisms depending on the seasonal fluctuations.[647] This is a simple compact[648] apportioning the flow of this small stream as equally as possible between the states. Gaging stations are installed and allocations are made based on the availability of water. The natural characteristics of the river are incorporated in the terms of the Compact[649] and the State Engineers of Colorado and New Mexico are authorized to adjust

[644] Hinderlider v. La Plata River & Cherry Creek Ditch Company, 304 U.S. 92 (1938), Hinderlider v. La Plata & Cherry Creek Ditch Co., 70 P.2d 849 (Colo. 1937), and La Plata River & Cherry Creek Ditch Co., 25 P.2d 187 (Colo. 1933). *See* State v. La Plata River & Cherry Creek Ditch Co., 73 P.2d 997 (Colo. 1937) for a discussion of Colorado legislation to permit the State to intervene in this litigation.
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[645] La Plata River & Cherry Creek Ditch Co. v. Hinderlider, 25 P.2d 187 (Colo. 1933).
[646] Hinderlider *supra* note 6 at 97.
[647] La Plata River Compact 1922, *see* Chapter 8 *supra* at 152.
[648] The Compact consists of seven articles, two of which pertain to the measurement and allocation of the water under the supervision of the State Engineers.
[649] La Plata River Compact, *supra* note 9 at Art. II available at http://www.ose.state.nm.us/isc_laPlata_river_compact.html.

the flow to permit maximum beneficial use of water in each state. Article II(3), the provision in question, calls for "rotating" water deliveries between the states during low flows:

> [W]henever the flow of the river is so low that in the judgment of the state engineers of the states, the greatest beneficial use of its waters may be secured by distributing all of its waters successively to the lands in each state in alternating periods, in lieu of delivery of water as provided in the second paragraph of this article, [one-half of the mean flow at the Hesperus station for the preceding day, but not to exceed one hundred cubic feet per second;] the use of the waters may be so rotated between the two states in such manner, for such periods, and to continue for such time as the state engineers may jointly determine….[650]

This provision permits the maximum amount of water to be used in each state during low flows when the percentage of conveyance loss is the greatest.

When State Engineer Hinderlider implemented Article II(3) of the Compact by shutting the headgates in Colorado the La Plata River and Cherry Creek Ditch Company (Ditch Company) sued him. Plaintiffs asserted several legal theories each of which was based on protecting the state law water rights of the Ditch Company as they were perfected, adjudicated, and decreed according to the prior appropriation laws of the state of Colorado. The basic conflict was between the prior appropriation water rights of the user and the interstate equitable apportionment effectuated by the La Plata River Compact.

The *Hinderlider* case provides a fitting example of the contentious relationship between water laws which develop from the bottom-up, such as the doctrine of prior appropriation which is the basis of the Ditch Company's rights, and water law which emanates from the top-down, such as the equitable apportionment contained in the La Plata River Compact. In addition, the institutional arrangement created by the La Plata River Compact is worth examining for the potential conflict created when one state officer is charged both with enforcement of local law and with administration of the Compact.

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[650] *Id. at* Art. II(3).

The La Plata River Compact provides that the State Engineers from each state must cooperate in the installation and operation of the gaging stations and the "exchange of records and data and publication of facts."[651] They are authorized to adjust the allocation during periods of low flow,[652] and they "may formulate rules and regulations for carrying out the provisions of [the] compact, which, when signed and promulgated by them, shall be binding until amended by agreement between them or until terminated by written notice from one to the other."[653]

Mr. Hinderlider was an officer of the state of Colorado. The Ditch Company sued Mr. Hinderlider in state court for taking its right to water when he shut their headgate in violation of the state court water decree. Mr. Hinderlider prevailed at the trial court by asserting compliance with the requirements of the Compact. The Ditch Company succeeded in having that decision overturned by the Colorado State Supreme Court after which Mr. Hinderlider was enjoined from giving effect to Article II(3) of the Compact.

The Colorado Supreme Court held that the Ditch Company has property rights which are a freehold interest and that Mr. Hinderlider took those rights without due compensation when he implemented Article II(3) of the Compact. The Colorado Supreme Court went on to cite provisions of the Colorado Constitution, the Colorado Water Code and the adjudication decree of the Colorado state court to support its decision[654] all of which it held Mr. Hinderlider violated. While acknowledging that the Compact is a compromise between conflicting claims of the states of Colorado and New Mexico, the Colorado Supreme Court took a very strong position for the protection of the rights of the users. Citing to previous decisions of the United States Supreme Court for equitable apportionment of water the Colorado Supreme Court stated:

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[651] La Plata River Compact, Art. 1.
[652] *Id.* Art. II(3).
[653] *Id.* Art. III.
[654] La Plata River & Cherry Creek ditch Co. v. Hinderlider, 25 P.2d 187, 188 (Colo. 1933).

> They [equitable apportionment cases[655]] do not touch the right of a state by compact, without notice, hearing, or compensation, to take property from one of its citizens and give it to another state or its citizens as a mere matter of expediency, without regard to the legality of their claims thereto, and in total disregard of existing constitutional, statutory, and judicial prohibitions.[656]

These are strong statements about the state law of Colorado, the law Mr. Hinderlider was obligated to obey. However, Mr. Hinderlider, represented by the Colorado Attorney General, did not accept this ruling, and he continued the appeal for an additional five years before eventually overturning the Colorado Supreme Court in the United States Supreme Court. [657]

The holding in *Hinderlider* provides the underlying principle to determine the relationship between local water law and interstate or international water law. "As [each state] possessed the right only to an equitable share of the water in the stream" the local water law cannot grant or award "any right greater than the equitable share."[658] The local users cannot obtain or hold rights to use water in a greater amount than the equitable share of the state.

Hinderlider also demonstrates the difficulties inherent in reaching a balance between the local users and an equitable apportionment among states. Interstate water negotiations are political processes subject to local as well as interstate pressures which do not abate with the conclusion of an agreement. The rationality of states to manage a shared watercourse for optimal and sustainable utilization depends on strong political will and the power to support that will.

Using these basic facts we can hypothetically change key decisions of Mr. Hinderlider to explore further the relationship between local law and an interstate agreement. The La Plata River Compact gives the State Engineers of Colorado and New Mexico discretion to manage the waters of the La Plata River to maximize beneficial use. What if Mr. Hinderlider acquiesced in

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[655] Kansas v. Colorado, 206 U. S. 46 (1907) and Wyoming v. Colorado, 259 U. S. 419 (1922).
[656] La Plata *supra* note 16 at 189 (Colo. 1933).
[657] Hinderlider v. La Plata River & Cherry Creek Ditch Co., 304 U.S. 92 (1938).
[658] *Id.* at 108.

the demands of the local users to maximize water availability within the state of Colorado. If he did not comply with the specific Compact requirements for deliveries of either 100 m3/sec, Article II (1), or for delivery of one half the flow as measured at the Hesparus gage, Article II (2), the state of New Mexico could bring an action against Colorado to enforce the terms of the Compact.

However, if Mr. Hinderlider did not agree with the New Mexico State Engineer to implement the provisions of Article II (3) permitting water deliveries to rotate between the states, or if he is enjoined from doing so, it is possible that the first priority users in the upstream state of Colorado benefit. The decision to maximize beneficial use in both states as permitted by Article II (3) requires a joint decision based on the professional judgment of the state engineers. In the absence of agreement, the flow is divided according to Article II (2) with one half for use in Colorado. The balance of the flow may or may not be sufficient to reach the users in New Mexico given conveyance losses.

While the *Hinderlider* case illustrates the importance of measures to provide flexible management in support of the implementation of an interstate agreement to maximize beneficial use, additional provisions could strengthen the management mechanisms. The integrity of the individuals to uphold the letter and spirit of the agreement may be balanced with more specific provisions limiting individual discretion such as a third decision maker or independent fact finder.

Historically water law developed at the local level to resolve local allocation of the resource as that resource became stressed. The principles of equitable apportionment among

states of the United States developed as a principle of federal common law approximately 100 years ago. Only in the past three decades has international water law crystallized in response to the increasing stresses placed on international watercourses.

We live in a globalized world in which the political thought about water must grow to recognize the interconnectedness of all riparian states and that the natural system of a watercourse disregards political boundaries. Too often water is still considered a local resource with states asserting sovereignty and attempting to protect local uses without an appreciation of a broader picture of the natural system within a river basin. Until the political atmosphere at the local and international levels becomes more aligned with natural conditions it may become increasingly difficult to conclude water sharing agreements as demand increases, local uses remain central to national economies, and the resource becomes more stressed.

A watercourse is a single resource, governed and managed according to multiple laws. These laws must be integrated in order to share this single, vital resource equitably and reasonably for optimal and sustainable utilization.

Final Thoughts

This paper used thousands of words to examine legal structures for water allocation from the bottom up and the top down. The law of international watercourses is still developing as watercourses around the globe become stressed and uses in one state impact users in other riparian states. This paper has demonstrated that international law, the law governing the interaction among states, is not the singular authority governing international watercourses and it has shown that the users, and the local legal regimes governing use, must be considered. However, even the most cooperative and inclusive legal regimes and basin institutions and the most developed local to international laws remain incomplete and unacceptably inadequate if people within a basin remain without clean water. Above all, water is a vital human need.