

International Riparian Law in the West and Islam

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The cornerstone of international fresh water law is the assumption that the allocation of scarce resources requires legal means, rather than coercive force, if sharing is to be equitable and conflict is to be avoided. In principle, long-term cooperation among sovereign riparians, particularly where water is scarce, would be well nigh impossible outside the buttressing framework of law.¹ But international riparian law can be efficacious only when riparians commit themselves to law as the first means for the delineation and regulation of rights and responsibilities, and the amelioration of grievance.

Basic Principles of Riparian Jurisprudence

Historically, international riparian law has been underdeveloped, eluding the efforts of jurists to sort out its complexities and persuade nations to subject their competing claims to a standardized code of legal principles. Those complexities have sometimes made the process appear muddled. Although in the era of the United Nations some headway in this direction has been made, progress has been so slow and achievement so meagre that some observers have concluded that no universal code of international riverine law is possible. Nevertheless, experience, scholarship, and jurisprudence (and, perhaps, not a little blind faith) have produced four basic legal principles that are generally invoked when riparians contend: absolute sovereignty, absolute or territorial integrity, community of co-riparian states, and limited territorial sovereignty.²

Absolute sovereignty (sometimes called the Harmon doctrine) decrees that a riparian may do what it will with the water (or any resource) within its boundaries without constraints—use it up, pollute it, dam it, send it downstream in any quantity or condition; in contradistinction, the principle of territorial integrity requires that the river's natural flow be uninterrupted in its downstream course, that the lower riparians have a right to the full flow and quality of the water; the theory of co-riparian communalism stipulates that the entire river basin constitutes a single, geographic and economic unit that transcends national boundaries, whereby the basin's waters are either invested in the whole community or shared among the co-riparians by agreement, the underlying assumption being that optimum use of the basin's waters mandates a cooperative, integrated development of the entire drainage basin; the notion of limited territorial sovereignty supplants the opposed principles of absolute sovereignty and absolute integrity by according recognition to a riparian's jurisdiction over the transboundary waters that flow through its territory, but

places limits on the exercise of its control over those waters in such ways as to insure the downstream states a reasonable share of that water in reasonable condition. Older principles such as first-in-use-first-in-right, historical utilization, beneficial (or optimal) use, good neighborliness, etc., are generally subsumed under these four principles. Whatever the legal principle, all of the rules devised for the sharing and apportionment of water are rooted in the notion that nations are obliged to cooperate in matters involving vital natural resources, especially when scarce.

Equitable Utilization and No Appreciable Harm

In modern times, a blending of the traditional notions of co-riparian community and limited territorial sovereignty has produced a hybrid legal principle that has gradually emerged as the preferred approach among juridical scholars, international law organizations, and state litigants. At the heart of this concept are the basic principles of equitable utilization and no appreciable harm (as will be seen, in this context equity does not connote equal). It remains debatable in legal discourse whether these principles are two facets of the same idea or are actually different concepts. However their treatment in two separate articles (5 and 7) of the International Law Commission's Draft Articles would indicate that they are to be considered as separate and distinct from one another. The International Law Commission of the United Nations (ILC) has proposed that the consolidated principle become an accepted premise for the conduct of nations in international riparian matters.³

In customary international law, every state is under an obligation not to cause harm to another, not only by direct action, but by allowing the use of its territory in ways that result in harm to the rights of other countries. No appreciable harm provides that while a state is entitled to use the waters of a river that traverses its territory, it may not do so in such a way as to cause appreciable harm to the river's other riparians. This proposition does not explicitly proscribe *any* harm whatsoever, and though "appreciable harm" has proven impossible to define precisely, it clearly means more than merely "perceptible" but not necessarily "substantial." That is, it must be harm of a certain gravity or significance beyond simple inconvenience. In its fortieth session the ILC adopted this definition in the belief that the concept could be objectified and that compliance could be judged on factual bases. At the same time, the term "harm" was given a meaning judged to be factual, to wit, "actual impairment of use, injury to health or property, or a detrimental effect on the ecology of the watercourse." Such harm was deemed "appreciable."⁴

Equitable utilization states that riparians of an international waterway are obliged to use, develop, and protect the watercourse in an equitable and

reasonable manner and are duty-bound to do so cooperatively. Each riparian has a right of utilization—reasonably and beneficially—equal to that of every other co-riparian. “Equitability” in this context does not mean a precisely equal share of the water; it is the *right of utilization* that is equal for riparian neighbors. Rather, equitability implies the idea of *proportionality*, a share and usage proportional to a riparian’s population and its social and economic needs, consistent with the rights of its co-riparians. Reasonable (or rational) usage may be explained as exploitation of water, or any other natural resource, in such a way as to conserve the resource “for the benefit of the present and future generations through careful planning and management.”⁵

It is worth noting that both the ILC and the Institut de Droit International, have publically embraced the “no appreciable harm” concept as the paramount rule governing international fresh water issues, particularly as regards the problem of water quality. However, that position is not unequivocal. Many members of those legal bodies, along with a sizeable number of legal scholars believe that “equitable utilization” should be the cardinal prescript in practice. Clearly, the two rules are closely related and both are often invoked, whether primarily or secondarily, in the same instances.⁶ In fact, the literal, narrow, nationalistic way in which some governments insist on interpreting “no appreciable harm”—that is, arguing that any action that causes a reduction of flow or the useability of the water, however small, without prior agreed-upon arrangements, constitutes appreciable harm—virtually negates “equitable utilization,” and if carried to its logical conclusion this construction of the “no appreciable harm” idea becomes self-nullifying (Egypt, Israel, and Argentina are among those nations who have adopted this posture).

The Nile River offers a good case in point. Egypt, for whom any sustained, significant reductions in the flow of the Nile could spell disaster, has taken a narrow view of the no appreciable harm proposition and argued that this principle should be the standard legal reference rather than equitable utilization. Supposing, hypothetically, Ethiopia, as part of its economic development and recovery program were to build a high dam (significantly above 15 meters) on the White Nile—a major feeder of the main stem of the river—and use the captured water in-country. That would reduce the flow of the Nile to Egypt by a certain amount annually. Supposing further that the Egyptians decided to adjudicate the issue rather than to settle it by the superiority of their arms; they would certainly invoke the principle of no appreciable harm, narrowly construed, and reject Ethiopian arguments based on rights conferred by equitable utilization and upper riparian status. If the principle of appreciable harm prevailed, either by a court judgement or imposed by military force, equitable utilization would be negated, but at the same time, Ethiopia would be denied the legitimate right of economic development, thus causing it appreciable harm.

Conversely, were the Ethiopian stance to prevail, Egypt would be appreciably harmed. In this circumstance, the result of a judgment either way would be a high social cost. When the successful invocation of the no appreciable harm principle produces substantial social costs and inflicts significant harm to the economic and legal rights of another party—as is clearly possible—the principle contradicts itself.⁷

Hence the argument of some specialists that the equitable utilization concept, despite its shortcomings, is the better legal guideline, a position strengthened by the authority the principle has drawn from becoming a rule of international customary law. A fatal weakness of a no harm rule in watercourse cases, as seen by advocates of the equitable use rule, has been summed up thus: "... in the last analysis, those called upon to apply it cannot insure that their decision or recommendation, as the case may be, is equitable and reasonable. This is so even if the rule is qualified by words such as *appreciable*, unless one is prepared to give them such a meaning that the rule becomes equivalent to that of equitable utilization." Proposals, as yet unsuccessful, have been made to reconcile the disharmony of the two principles chiefly by interpreting the no appreciable harm doctrine as not imposing a standard of strict liability, but rather a standard of "due diligence."⁸

Empowerment and Constraint

This hypothetical Egyptian/Ethiopian situation was a little simplified for the sake of making a plausible point regarding an otherwise complex issue. But the hypothesis calls into view another aspect of the law that falls into the "what-the-law-is-and-is-not" category that must be borne in mind if wrong assumptions are to be avoided. It is generally agreed that the law is not merely a set of received, concrete rules that encompass all the exigencies of human society, and that if one knows the rules one will know the answers to tough problems that fall within the purview of the rules—this axiom applies no less to customary law. The law does not simply stipulate that something is clearly right in each instance, it may say that two things are equally right, or both are right but one has precedence, as is often the case in disputes over claims to property or contracts. But the law does demark what is wrong and what may not be done.

In most cultures, the law in essence is a judicial process that seeks to settle problems in practical, pragmatic, realistic, flexible, humane, and moral ways that take into account the complexities and inconsistencies of human behavior and social values. As a human process that involves human judgement, it is, consequently, subject to frailties and imperfections; but because man-made law is

changeable—as opposed to divine law, which by its divine origin is always considered perfect and immutable—it can right its mistakes and remain viable over time. In Islamic law, which is understood to have come directly from God, certain mechanisms of consensus, analogy, and common sense have evolved which allow the law to move with the times.

Basically, what the legal process does, for both domestic and international actors, is to enable (or empower) them by legitimating their claims, and, conversely, to constrain them by limiting the claims they are permitted to make. But to do so effectively, it must have the necessary legal institutions in place—courts, police forces, various government bodies that legislate and regulate by some codified legal system and represent the legitimate interests of the citizenry at individual and corporate levels, etc.

This same institutional requirement applies in the international sphere as well, in the form of international courts and organizations that are supranational and are empowered to enforce judgments by recognized international legal means. In the international sphere, treaties are the key legal instruments, but to enable the judicial process to function effectively, treaties must include arrangements for settling disputes by rules of law through appropriate legal institutions. These goals have been difficult to achieve in international law, particularly as regards transboundary and international rivers. The World Court of the Hague, the premier international legal institution, has functioned for decades, but with relatively little impact because it has never had a practical means for enforcing its rulings. Although Article 94 of the U.N. Charter authorizes the Security Council to enforce World Court judgements, the combination of Council politics and the veto power of its permanent members has rendered the Security Council impotent to act on its charter mandate. Thus, riparian and other conflicts continue for the most part to be dealt with by specific treaty agreements or by power relationships or, sometimes by mediation in combination with the other two choices, but without necessary reference to or application of law: “In the absence of a neutral enforcement mechanism, international law has nothing better to offer for sanctioning violations than the law of the vendetta.”⁹

Optimal and Beneficial Use

The principle of equitable and reasonable use is itself composed of two constituent elements: the right of states to optimum utilization and benefits and the obligation to cooperate. In this context, various court rulings (e.g. the North Sea Continental Shelf Case, 1969, which has application to transboundary waters) make clear that—in the same way that equitable does not mean equal—optimum use does not mean utmost or maximum utilization and that the right of optimum

benefits belongs equally to all riparians along a waterway, with the coda that the apportionment of benefits must also be equitable and reasonable.¹⁰ However, the relative simplicity of these propositions is illusory. In any situation the determination of what constitutes equitable and reasonable utilization must reckon with a multitude of factors such as the geology, hydrology, and geography of the basin, demographic trends, current and future use based on demand and real need, multiple uses (non-navigational and navigational) and the priority assigned to them, sustainable development plans, and environmental and ecological considerations, to name a few.

Even the requirement that beneficial use must be made of any apportioned water under question—a putatively simple proposition—is in fact legally complicated. The principle itself is difficult to define with precision as it is constituted of two separate but related elements: social utility and engineering efficiency, or put more simply, the use must have social and economic value. The use of a given resource may have an intrinsic economic value, but that quality does not necessarily make it autogenetically efficient. Value and efficiency are linked; and so as criteria, both must be satisfied if a use is to be considered beneficial. Water that is wasted in its use may still have some degree of social value, but to the extent that it is wasted, i.e. inefficiently utilized, its economic value is diminished. A use is deemed to be beneficial if it entails some socially accepted purpose and makes reasonably efficient use of the water with a positive economic outcome—irrigation and hydropower are two obvious examples.

Assuming that a use has been ascertained to be beneficial, several more considerations must be taken into account before riparian rights can be settled. For example, the beneficial use by one riparian in an international basin must not impede beneficial uses by another basin state, and if there is hinderence or conflicting use, an effort must be made to reconcile the parties and settle which uses will predominate should conciliation fail. This process involves reckoning those same factors cited as necessary in determining equitable and reasonable use, thus bringing the matter full circle. The beneficial use precept is useful in adjudication when the issues involved clearly reveal the justice and fairness of a case and when the litigants are disposed toward an agreement. In fact, the relevant statute of the International Court of Justice (Art. 38[2]) permits decisions on this basis only if the parties specifically so agree.

The Helsinki Rules

These prescriptions are embodied in the 1966 Helsinki Rules of the International Law Association (ILA) and are spelled out in greater detail in the ILC's most recent 1991 report.¹¹ The Helsinki Rules are essentially a

compendium of useful guidelines for the application of law as opposed to coercion in the settlement of riparian disputes. The Rules deal with four prevailing principles and their offshoots, but in the end come down in favor of equitable and beneficial utilization. As stipulated in the key article (III), each basin actor is entitled within its territory to a "reasonable" and "equitable" share in the beneficial uses of the waters of an international drainage basin. But, unlike the ILC, the ILA did not attempt to provide an objective or operational definition of such pivotal concepts as equitable, reasonable, etc. It is not only the complexity of the issues being defined that accounts for the generality or even vagueness that often characterize these legal usages, but the recognized need for built-in pragmatism and flexibility where international or transboundary water questions are concerned.

In further regard to the Helsinki Rules, it should be made clear that because the ILA is a private, professional association without official status, the Helsinki Rules, as a consequence, have no official standing either, although the essence of the Rules has been encapsulated in the draft treaties of the ILC which is an officially constituted international body of legal experts. The Helsinki Rules represent little more than the collective opinion of a group of experts in the relevant fields of international law. Such opinions carry only the weight of a secondary source of international law insofar as they provide evidence of customary international law. The International Law Commission, on the other hand, is an official organ created by the United Nations, and although its work is also merely secondary evidence of customary international law, the ILC's standing is higher in the field owing to its official status and because its work is expected to become the basis of a multilateral treaty on the peaceful non-navigational uses of fresh water which, should it be ratified by the members of the U.N., will then become a direct primary source of international law.¹²

Groundwater and the Bellagio Draft Treaty

Until recently, the rules governing surface water sharing were applied to groundwater as well, but that circumstance has been changing since the appearance of the Bellagio Draft Treaty Concerning Transboundary Groundwater and the 1991 ILC report. While groundwater may be defined in the most simplified terms as all water beneath the surface of the ground which remains a part of or in contact with the ground or subsoil, it should be noted that groundwaters are usually integral parts of a watercourse system whose other hydrographic components such as rivers, lakes, canals, glaciers, etc., are above ground.¹³

In terms of extraction, a mechanical or engineering dimension must be added to the definition of groundwater. Where water exists below ground, it is

generally situated in a zone of saturation which lies beneath a zone of aeration. There, water is mixed with air in the soil. Only water in the zone of saturation is removeable as groundwater. The water in the zone of aeration is "soil moisture" which is beneficial to plants but is, for the most part, unexploitable. Precipitation may be captured before it enters the ground—various water harvesting techniques have been practiced since antiquity—but once it passes below the surface, it cannot be withdrawn until it seeps down to the zone of saturation where it is stored in various permeable rock formations such as limestone. These water-bearing rocks are aquifers and may be constituted as formations or entire groups of formations. Such a water source is renewable. Fossil groundwater is very old water—perhaps hundreds of thousands of years old—that has been locked into impermeable underground rock, is finite, and non-renewable.¹⁴

As connected parts of surface water systems, groundwaters constitute, legally and politically, international or transboundary watercourses. Like counterpart surface water, groundwater does not respect political boundaries, often traversing several as it flows seeking its own level or outlets. For example, the Northeastern African aquifer moves under Libya, Egypt, Chad, and Sudan; Saudi Arabia, Bahrain, and the UAE, overlies the same aquifers while the Qa Disi aquifer underlies both Saudi Arabia and Jordan. The most legally and politically controversial shared groundwater in the region—the West Bank mountain aquifer or the Yaqon-Taninim—lies mainly under occupied Palestinian terrain but is wholly controlled by Israelis by virtue of the occupation and percolates into Israel across the Palestinian-Israeli Green Line. The chief difficulty hampering jurists who aim to establish precise definitions and devise rules for the sharing of underground water is a serious paucity of data on most aquifer systems; many important aquifers are not even fully mapped yet. Consequently, adequate international law and legal institutions for the peaceful and equitable management of transboundary groundwater resources barely exist, and those few laws and institutions that do are notoriously weak. The need for an effective model treaty has become urgent.¹⁵

The Bellagio Draft, the product of an eight year endeavor by a multidisciplinary group of specialists that included jurists, scientists, and social scientists, emerged from a collective awareness among water and legal experts of the acute need for a legal framework for dealing with transboundary and international groundwater disputes. The group's formation was encouraged by the ILA with the hope of producing an unofficial codification of international groundwater law that would be taken up by the ILC and made official. (In 1980, the U.N. had already given the ILC the task of codifying international fluvial law on the non-navigational uses of international waterways.) The initial phase of the group's work culminated in the 1986 adoption of the Seoul Rules on International Groundwaters, and the group met again in 1987 at the Rockefeller

Center in Bellagio, Italy, and the proceedings of that meeting became the basis for a thorough revision of the Draft in 1988. It is this version that constitutes the current Bellagio Draft Treaty that has been taken into account by the ILC in its endeavors.

In recognition that international groundwater law and institutions are at an incipient stage and weak, the group set as one of its main purposes to provide legal mechanisms for the management of international aquifers by mutual agreement of concerned parties rather than by unilateral actions fraught with conflict potential. In an effort to be comprehensive, the drafters addressed a wide range of issues, e.g., contamination, depletion, drought, transboundary transfers, withdrawals, and recharge. The Bellagio Draft Treaty is founded on the principles that underground water rights should be regulated by mutual respect, good neighborliness, reciprocity, and collective agreement, and it acknowledges that the fulfillment of these notions requires joint management of the resource.

The fundamental goal of the 20 article draft treaty is to promote optimum utilization of available groundwaters, facilitated by strategies for conflict avoidance or resolution in the face of rising demands for very limited supplies. To achieve these goals, and in anticipation of claims by individual states of absolute sovereign rights, the drafters of the treaty employed three tactics: 1) rather than assert joint administration along the entire line of borders crossed by an aquifer, international control would be applied only in zones that have become critical owing to withdrawals that exceed recharge or because contamination seriously threatens quality; 2) enforcement would be the responsibility of domestic administrative agencies of each country with oversight and facilitating services provided by an appropriate international commission; and 3) only limited substantive powers are delegated to the joint agency, which is, however, instructed to take initiatives—subject to the user governments' approval—in anticipating and addressing the problems that confront the co-users of transboundary groundwaters. The enforcement of these measures would be left to the responsible authorities of each nation within its own territories, and the draft further suggests mechanisms for dealing with uncontrolled withdrawals, planned depletion, drought reserves, water quality, protection of recharge areas, public health emergencies, and procedures for settling disputes.¹⁶

Islamic Water Law

There is another body of water law, *sharia*, or Islamic law, which by its nature is religious law, whose rules regulated water issues in the Middle East for almost a millenium and a half. Although *sharia* has been largely superceded by

westernized codes of law in the last century and a half, it is still applied in many Islamic nations where, in some instances, the spirit of traditional Islamic water law has been incorporated into more recent secular legal codes that have been adopted. With the resurgence of religious fervor in the Muslim world there have come demands for the application *sharia* in all aspects of life in Muslim societies. What Islamic law has to say about the hydrologic culture of the region, and the relevance of Islamic law to present water conditions must therefore be seriously considered. Indeed, this is a basic requisite since in Islam, a Muslim society is defined as one that adheres to *sharia*.¹⁷ Moreover, Islamic water law, compares very well with western canons on water.

The significance of water in Islamic legal thought is disclosed in the double meaning that the word *sharia* carries. In the first instance, it reveals the moral path that Muslims must pursue to attain salvation, and at the same time, in a more technical (and perhaps older) sense, it denotes access to the source of pure drinking water that must be preserved for humans. Specific hard and fast rules of Islamic law are relatively few (general moral guidelines are more characteristic), and where water is concerned—unlike other areas of Muslim jurisprudence—*sharia* tends to be less rigid and is applied more in the spirit of the law than in the letter; that is, more by the application of custom (*urf*) and reasoning than by strict doctrine. By and large, because received customs represent the collective norms of the group and contain rules of behavior considered essential to the well being of the community, societies tend to feel bound to observe them.¹⁸

Customary Law in Islam and the West

Although customary laws differ from one Muslim society to the next, and though there are differences between Muslim and western customary laws, they do share certain common traits. Customary water law is of fundamental importance to western legal systems and to *sharia* alike, and further common to both, customary law as a juridic model combines advantages with serious vexations. Rooted in communal experience, custom offers societies living under both legal systems the benefits of legitimacy, familiarity, adaptability, and flexibility which allow for positive, practical rulings. Given the wide ranging diversity of conditions and situations from river basin to river basin the world over, the exploitation of these qualities is often essential to conflict avoidance.

On the other hand, the same characteristic of adaptability that makes customary law flexible and responsive also makes it susceptible to inconsistent or idiosyncratic applications in such basic matters as attributes of property, communal titles, inalienability of ownership, and community obligations versus individual authority. For example, if a river system devoid of fish were

artificially stocked, hypothetically, people at any point in the system on either side of a boundary could claim a prior customary right to all the fish. The underlying problem in the international arena is not the dynamic (i.e. changeable) or flexible nature of custom, rather it is the lack of a developed and consolidated legal institutional structure for resolving disputes. The absence of such institutions of law robs the parties to a disagreement of any adequate juridical means for constraining the idiosyncratic desires of a disputant. In these circumstances relative power will settle the matter between the parties, with victory going to the dominant actor.

There is a body of legal theory that provides guidance on how to prove custom and how to determine its relevance. But there remains a problem, largely an academic one, which nevertheless requires attention. In both Muslim and western cultures, it is generally assumed that customary norms underlie customary laws, but since such norms are not codified, it is difficult to prove their existence jurisprudentially, especially in international customary law. This is particularly so as regards watercourse systems, each of which is unique in some way. Both *sharia* and the western system of law are based on evidentiary proof, but direct legal evidence by which to ascertain the rules of customary law, international and local, is hard to come by, so resort must be made to secondary sources such as state and communal practice, societal behavior, and the empirical studies of recognized experts. In the modern era, there are increasing instances where the state and community or individuals are at variance in their claims and objectives owing in large measure to the changeable (dynamic) nature of customary law with its implicit assumptions. Modern law has tended to avoid reliance on custom while traditional law was largely composed of custom. Consequently, there has been a growing disjunction between modern codified law and traditional customary law in both Islamic and western societies.¹⁹

There are many ways in which customary rights, which tend to be imprecise, and modernization can clash: natural features of a stream or basin can be invested with religious or mythic significance that are too entrenched to allow hydrological or economic development, especially in arid regions; perceived traditional rights to cultivate river beds and banks or to fishing rights can impede river regulation, or the building of a dam, or desilting. Owing to the inexact nature of customary rights, a claim put forth can be, for political or cultural reasons, larger than the ability to exploit it, for example an insistence on using *all* the water in a river. (In the Jordan basin, Israel's use of all the waters of the Jordan River is based not on customary rights, but on its power to do so arbitrarily without effective challenge). The negative aspect of international and regional customary law has been summed up this way: "Because of the dynamic character and uncertain scope of many customary rights, recognition of their existence must necessarily depend on *assertion rather than proof* [emphasis

added]...the lack of externally verifiable or corroborative indicia of an asserted right is profoundly unsettling.”²⁰

Thus, customary law which has traditionally been a paramount form of jurisprudence in the litigation of water issues, particularly in Islamic societies, has carried over into the modern era both its strengths and weaknesses. Because of the complexity of modern life, marked by an exponential growth in the world's population (especially in the arid Middle East), by a striking increase in the number of sovereign nations that share the same supply of water, and by the ubiquitous diffusion of life-changing modern communications and technology, traditional customary law will, in all likelihood, be increasingly supplanted by or subsumed in other juridic approaches to international water law deemed to be more relevant to “modern” conditions—as the ILC's latest efforts attest.

The Personality and Rules of Islamic Water Law

Beyond the general characteristics of *urf*, it is worth noting certain other qualities of Islamic law that have a bearing on water issues: *sharia* is not a national law in the sense that American or European, or Japanese legal systems are. Generally, Islamic law has been applied regionally. Because there are four major schools (*madhahab*) of *sharia* which are employed diversely in different parts of the Islamic world, there have always been wide variations in the interpretation and application of Islamic law according to the different schools and even within the same school as practiced in different Muslim nations.

However, the significance of the extra-national or extraterritorial nature of *sharia* is that, by this quality, it is constitutionally international. That is not to say it is formally or institutionally codified as “international” in the way that there is a separate body of law in the west that is designated as such, and to which individual nations are asked to adhere. It is, rather, a generalized set of divinely ordained moral guidelines for living an ethical life, which are organized into systems of positive law based on evidence and precedents. These broad moral rules are incumbent upon both the Muslim individual and the community, that is, nation. *Sharia*, being the literal, perfect word of God, is considered to comprehend all circumstances and exigencies of the human condition, universally, without national or international distinction. *Sharia* recognizes and embodies the concept of a law of nations, and since at least the nineteenth century when Muslim nations began practicing reciprocal diplomacy according to European rules, western and Islamic understanding of that notion have been in harmony.²¹ There is, therefore, no innate reason why *sharia* is not adaptable to any of the contemporary international principles of water law being proposed by various international legal organizations.

In a related sense, another aspect of the genius of Islamic culture, which explains in considerable measure its success, has been its capacity for borrowing and adapting the ideas, technology, and practices of other cultures, then Islamicizing the borrowings—particularly customs and institutions—thereby conferring on them a moral legitimacy. (The yearly pre-Islamic pagan pilgrimages to the Ka'aba in Mecca, transformed by the Prophet Muhammad into the Haj, or annual Muslim pilgrimage to Mecca for spiritual renewal, is perhaps the clearest historical example). However, where water is concerned, more than one scholar has warned of the snare in assuming that "because a society is Muslim, what it does is Islamic."²²

Islamic law per se offers few specific, hard-and-fast rules governing the sharing and use of water. Water appears in the Quran only about half a hundred times, without a clear legal character or sanctions; rather, the emphasis is on water as the source of life: *Have not the unbelievers then beheld that the heavens and the earth were a mass all sewn up, and then We unstitched them and of water fashioned every living thing?* The traditions (*hadith*) of the Prophet Muhammad offer no more precise legal language than the Quran, as for example: *He who withholds water in order to deny the use of pasture, God withholds from him His mercy in the Day of Resurrection.*²³

Sharian water law derives in principle and for purposes of taxation from juridical rules governing land. Muslim jurists have consistently treated water, land, and crops as indivisible, and water rights have generally been restricted to amounts considered to be adequate for a given crop area. This is based on one of the few stipulations the Prophet is said to have articulated in a *hadith* concerning water, that the sum of water to be drawn was not to exceed that which is needed to cover a cultivated plot to two ankle's depth. ("In the Mahzur Valley dispute, the Prophet decreed that water over the depth of two ankles cannot be withheld by the owner of the higher [ground] from the owner of the lower lands." —Mawardi).²⁴ This provision hypothetically fixed the basic legal principle for allocating water in Islamic law. By and large, the relatively few *hadith* concerning water appertain to the rights of ownership to wells and springs, to rights of access to water, the obligation to share water, and prohibitions on selling water. Although for purposes of use, allocation, and adjudication water is segregated according to source—river, well, and spring water, and further into rain, snow, and hail—*sharia* in fact recognizes only two broad categories of water within which all others are comprehended: owned and not owned.

Most Muslim legist consider water generally to be beyond the pale of private ownership—*mubah* or *res nullius*—that is, a substance which cannot be owned unless it is taken in full possession, such as water contained in a jar. If

water is claimed by the state, the ruler is considered to hold it in trust for the community or nation because the Prophet is said to have declared in a *hadith* that "...mankind are co-owners in three things: water, fire, and pasture." No person or ruler may appropriate a river or sell, rent, or lease its water nor may he tax such a resource; only a product that results from its use may be subject to a levy by the state.²⁵

One school of law, the Maliki, extends to individuals broad, firm rights of ownership and with it, the right to refuse "the use of such waters to any or every one; or he may consent to their sale to anyone he pleases at his discretion, just as if the water was in his actual possession, as in a pot, a jar, a water bag, or bowl." But these rights end if the denial of water for any reason might result in the death of a person: "In such circumstances, water must be abundantly provided without payment, and all ulterior claims are forbidden." According to tradition, a man of the Badiya tribe asked Muhammad "Oh Prophet! What is a thing that is not legal to withhold?" and the Prophet answered "It is not permitted to withhold water and salt." By the same principle, water for irrigation must be accorded a neighbor who for any reason has lost his water supply and his crops are in danger of being fatally parched. In fact there are *hadith* that permit the use of arms if water is denied unjustly or refusal to its access causes a threat to life: "If I were not to find a passage for the water but on your belly I would use it"—
Umar b. al-Khattab, companion of the Prophet and second Caliph. On another occasion when Umar was told of a tribe that refused access to water to people who needed it, he is said by tradition to have asked them "Why did you not use arms against them?"²⁶

A profile of the legal personality of Muslim water law reveals it to be highly pragmatic, largely customary, and supple in its application of moral principles as guidelines; in summary thus: no persons may be denied water that is necessary for their survival or livelihood; while animals have clear legal rights to water, humans take precedence in use; drinking water for man and beast and for domestic uses take priority over agricultural needs; once all drinking and domestic requirements of the community are satisfied, those living upstream have antecedent rights based on the assumption that the natural course of canalization and therefore settlement proceeds from the upper reaches of a watercourse onward downstream; on the principle of first-in-use, first-in-right, upstream riparians enjoy priority—again, because in Islamic law, in the absence of convincing proof otherwise, they are presumed to be the first settlers; but when new societies are settled upstream after the establishment of downstream communities, the usage rights of the new community are subject to adjudication and their withdrawals must not adversely affect historical prior rights; the hoarding of surplus water, even if all of the needs of the community are met, is forbidden; water is considered to be an overriding community interest, and both

Islamic law and the Prophet's traditions deem as immoral its treatment as a product for commerce or speculation. Finally, as an addendum to this summary, sharia rules governing the appropriation of water originate in those that regulate the appropriation of land, to wit, expropriation and use must derive from an input of labor, e.g., building an irrigation canal. Only the fruit of labor matters. It is the irrigation channel and the irrigated field and its crop that may be owned in inalienable right (*mulk*) by virtue of the labor that created them, not the water that flows through the one into the other. Water is the product of Allah's labor, not man's, and therefore can be used only transitorily in accordance with *sharia* and *urf*.²⁷

A word is in order about the apparent anomaly in the presumption that the sequence in which a watercourse is settled is from upstream to downstream and the first-in-right principle based on that assumption. One might easily conclude that perhaps only desert dwellers with no experience of river basin settlement could make such an error, but the governing factor was probably the direction in which canalization of water proceeded. In point of fact, historically, settlement in most river basins, particularly those that involve heavy off-stream use of water, normally proceed from the lower end of the basin because it tends to be more level, which affords easier agricultural development and urbanization than more elevated upstream regions. Thus, priority in utilization as a principle of law has usually favored the downstream users. Islamic law, as reflected in the *hadith* tends to do so as part of the Prophet's efforts always to protect the smaller, less powerful users of land and water. Recently, some jurists have argued that if the claims of earlier users for vested priority are protected to the degree on which they tend to insist, that would violate the notion of developmental equity, a concept that plays a large role in international economic and environmental programs.²⁸

Let John Wilkinson, who has unusual understanding of the nature of *sharia* water law, provide the capstone for this treatment of the subject:

The framework of Islamic water law is comprehensive. The Islamic legal system exploited very fully the pre-Islamic conventions, practices, and customs, which covered an enormous range of temporal and environmental experience. The practices of the Arabian, Iranian, and Mediterranean worlds were rapidly incorporated into Muslim practice: harnessing ephemeral flows, run-off farming, meso/micro catchments, terracing, cisterns, tanks, dams, qanats, rotary systems for groundwater and river lifts, weirs, canal systems, Greek geometry and oriental decimal systems for dividing water rights, bridges, ciphons; not to mention basic

universal techniques of water use of simple well lifts, springs, periodic and permanent flooding, seasonal irrigation, etc....there was a full panoply of water exploitation before the advent of Islam....It is fortunate that Islam was able to incorporate all this experience into a land and water code without taking the narrow view....Interpreters of the law understood the need for a flexible system, hence the Muslim community was able to absorb into its system a vast array of experience.²⁹

More Uncertainties and Vexations

Certain fundamental issues of water law that continue to nettle western jurists—namely the questions of how to define precisely the term “international watercourse” and whether it is possible to create a single set of articles whose provisions are applicable to the myriad international watercourses around the world—appear not to be so troublesome to Muslim jurists. Perhaps that is so because in its legal personality Islamic law focuses on the individual Muslim and his or her moral condition. Although there are legal obligations that are collective and fall on the whole community of true believers, most *sharia* rules postulate moral behavior for the unitary believer with a view to ensuring his or her salvation. And, hypothetically, these prescriptions obtain wherever a single Muslim or community of Muslims exist, irrespective of national boundaries. (This is not to imply that for these reasons *sharia* provides the elusive uniform international water code—though, with its pragmatism and flexibility, it does constitute one legal model worth examining; Islamic law has yet to demonstrate that it can cut through all the varied issues surrounding all the planet’s river systems and fashion a workable universal code for all cultures). Further, in those relatively few nations where *sharia* is the exclusive system of law, for example some of the countries of the Arabian Peninsula, there are no international fresh waterways (except for a few fossil aquifers which are not highly developed and are not the subject of much litigation) or in regions where there are, not all the riparians involved apply Islamic law. Then too, there is a tendency among Muslim nations to employ some form of western international law in the international arena and to use *sharia* for domestic and family matters.

What makes these basic questions problematic for western legal bodies who try to resolve these issues, is that the prevailing hydrological and other watercourse conditions, together with individual state needs, vary so widely among nations who are called on to apply whatever articles of international water law are codified. Thus, even though the articles of law may be uniform in

their intent, the uses made of them may diverge widely from state to state. Recognizing the unlikelihood that this circumstance will change, the ILC has attempted to ameliorate the problem by incorporating into its draft articles as early as 1980 an approach that has been labeled a "framework agreement." The "framework agreement" principle, which has been carried over into all subsequent ILC drafts, allows individual states to reconcile the rules set forth in the articles concerning international water through specific riparian agreements with their actual or perceived needs and with the conditions of the particular watercourse involved.

Certain ambiguities in the ILC's work—uncertainties that are probably unavoidable—compound the problem and at the same time reflect the difficulty of drafting universally acceptable codes of international fresh water law. The former Special Rapporteur of the Commission has offered an example: "...the Commission in practice has never found it possible to characterize a given draft as being one of codification or one of progressive development...The result is that, with very few exceptions, neither the commentaries nor the articles themselves contain indications—apart from sometimes extensive citations to supporting authorities—as to whether the provisions of the draft represent proposals for new law or codifications of existing norms."³⁰

Perhaps the time has come to recognize that until all nations agree to invest international law with sufficient transcending authority over sovereign law—as when treaties were given greater force than domestic laws—it will be impossible to write a uniform, universally applicable international fresh water code of law. In the absence of such an agreement, the hydrological and environmental diversity of the world's individual surface and groundwater systems, together with the regional cultural and historical traditions that attach to them, will always overwhelm such efforts, however laudable. It might be more profitable, in the meantime, to encourage the drafting of regional codes by regional actors that reflect local conditions and interests. At the same time, the initiators and ratifiers of such regional agreements (which must perforce be at once legal and political) should be exhorted to create region-wide water institutions or agencies and invest them with sufficient supra-national authority to implement and administer the new laws effectively.

Although riparians who make contentious claims over shared rivers rarely resort to legal measures in international courts of law—in this respect, the Middle East is prototypical—they nevertheless always adopt that particular legal theory that best suits their position on the disputed waterway in order to justify their demands, using it more as a bargaining ploy than serious legal argument. International law as an instrument of regulation on transboundary fresh water issues is at present inconclusive and weak. This circumstance has allowed

riparian water issues to be manipulated as part of the power relationships not only in the Middle East, but in other world regions as well. There is nothing inherently lacking in legal theory or in law itself—Islamic and western—that has produced such a condition. The basic problem—it is precisely at this point that politics and law come together where water is concerned—is the absence of prior formal political agreements—treaties—that govern the general and specific terms of shared waters, together with essential international or inter-riparian oversight that assures compliance among the users.

Worldwide, some 286 international fluvial and other fresh water treaties have been concluded. Of those, about two thirds concern North American and European river systems, the rest are scattered around the globe. In the Middle East region, with one notable exception, international treaties regulating the sharing, use, and quality control of water are virtually non-existent; it follows that there are no legal institutional arrangements either. The exception, the previously cited 1959 Egyptian-Sudanese apportionment agreement on the Nile, involves only two of the ten Nile riparians. Political and ideological rancor or outright hostilities have defeated sporadic efforts to fashion multilateral (or even bilateral) cooperative schemes for the use of the other major river basins in the area, the Jordan, Euphrates, and Tigris. Several commissions have been proposed and a few have actually been born into short, unproductive lives. Well intentioned mediatory efforts by regional and outside parties have withered away as well. These endeavors have produced many reasonable, integrated basin and regional plans for the allocation and distribution of Middle East waters across jurisdictional boundaries which could be fairly and effectively sustained by legal instruments and institutions if the political obstacles to cooperation by treaty could be overcome.

Such agreements are the essential first steps toward transforming legal theory into the institutional application of law. Only with the political agreements in place—whether they are multinational, such as the law of the seas, or simply basin focused, such as the 1959 Egyptian-Sudanese treaty which deals only with a major part of a single river basin—can there be created an adequate array of effective legal instruments for solving disputes that arise over shared water resources. While law cannot provide all the needed answers, and must await political settlements, law is nevertheless indispensable to finding and maintaining legitimate, sustainable solutions.

¹ Dellapena, Joseph, "Water in the Jordan Valley. The Potential and Limits of Law," *The Palestine Yearbook of International Law*, vol. V, 1989, 37; generally, for

this section useful reference may be made to the following: Naff and Matson, *Water in the Middle East*, 158-180; Teclaff, L.A., *The River Basin in History and Law*, The Hague, 1967 and *Water Law in Historical Perspective*, New York, 1885; Teclaff, L.A., and Albert Utton, eds., *International Groundwater Law*, 1981; Utton and Teclaff, eds., *Transboundary Resources Law*, 1987; U.N. (Legislative Series), *Legislative Texts and Treaty Provisions Concerning the Utilization of International Rivers for Other Purposes Than Navigation*, New York, ---; U.N., Natural Resources/Water Series No. 1, *Management of International Water Resources*, 1975 (reproduces the texts of the Helsinki Rules (1966), the Salzburg Declaration (1961) and various treaty texts); International Law Association, *The Helsinki Rules on the Uses of the Waters of International Rivers*, Report of the 52nd Conference, Helsinki, Aug. 14-20, 1966; International Law Commission, *Report on the Law of Non-Navigational Uses of Rivers*, Yearbook of the International Law Commission, A/CN.4/Ser. A, 1971-1988; Saliba, Samir, *The Jordan River Dispute*, The Hague, 1968, 46-70. (Most of the sources for this study were drawn from the AMER (Associates for Middle East Research) database in Philadelphia).

² On the history of international riparian law and on the various principles and theories summarized below, the following sources are best consulted: Teclaff, L., *The River Basin in History and Law*, The Hague, 1967; Caponera, Dante, *Principles of Water Law and Administration, National and International*, Rotterdam, 1992, 212-27, and *The Law of International Water Resources*, Legislative Study No. 23, FAO, U.N., Rome, 1980; Garreston, A.H., Hayton, and Olmstead, C.J., eds., *The Law of International Drainage Basins*, New York, 1967; McCaffrey, Stephen C., *Seventh Report on the Law of the Non-Navigational Uses of International Watercourses*, International Law Commission, 43rd Session, 29 April-19 July, 1991, U.N. A/CN.4/436, and Supplement N. 10, (A/46/10); Bilder, R.B. "International Law and Natural Resources Policies," *Natural Resources Journal*, vol. 20, July 1980, 451-86; Bourne, C.B., "The Development of International Water Resources: The Drainage Basin Approach," *The Canadian Bar Review*, vol.47, no.1, March 1969, 62-82; Institut de Droit International (IDI), *Annuaire de l'Institut de Droit International—Session de Salzbourg*, Basle, 1961; U.N., Report of the Panel of Experts, *Management of International Water Resources: Institutional and Legal Aspects*, Natural Resources/Water Series No. 1, NY, 1975.

³ ILC, *Report of the ILC on the Work of its Forty-Third Session, 29 April-19 July, 1991* (Henceforth *Report*, 1991); Barberis, Julio A., *International Groundwater Resources*

Law, FAO, Legislation Branch, Rome, 1986, 38-39 (henceforward *Groundwater*); Schwebel, S.M., *Yearbook of the International Law Commission*, 1982, vol. II, Part One, 103 (henceforward *Yearbook*, 1982.); Caponera, *Principles*, 133-160, 183-197.

⁴ U.N., *Yearbook of the International Law Commission*, A/CN.4/Ser.A/1988/Add. 1.

⁵ Barberis, *Groundwater*, 49.

⁶ See McCaffrey, "Water, Politics, and International Law," in a forthcoming publication, *Water in Crisis*, Peter Glieck, ed., Oxford, 1993; McCaffrey, former Special Rapporteur of the ILC, cites in support of equitable utilization, among many sources, 14 multilateral treaties and a considerable body of evidence of customary international law; a leader in the debate to make equitable utilization the paramount relevant principle is Charles B. Bourne—see his "The International Law Commission's Draft Articles on the Law of International Watercourses: Principles and Planned Measures," *The Colorado Journal of International Environmental Law and Policy*, vol. 3, no. 65, 65-92. Professor Bourne is the chair of the ILA Committee on Water Law, and as such is something of a guardian of the Helsinki Rules.

⁷ For further discussion of these two principles and the debate surrounding them, see Bourne, "Watercourses," *passim*, and Dellapenna, J., "Building International Water Management Institutions: The Role of Treaties and Other Legal Arrangements," unpublished conference paper, courtesy of the author, 54 pp (Henceforth "International Water Management"). I am indebted to my colleague Professor Dellapenna (Villanova School of Law) for his guidance and insights on how the law functions—including his ideas on the Egyptian case study—which have strengthened this chapter; he is, of course, in no way responsible for any of its shortcomings.

⁸ Bourne, "Watercourses," 90.

⁹ Dellapenna, "International Water Management," 8-9, and Bilder, R., "Some Limitations of Adjudication as an International Dispute Settlement Technique," *Virginia Journal of International Law*, 1, 1982, 23 (cited by Dellapenna).

¹⁰ ILC, *Report*, 1991; Barberis, *Groundwater*, 48-50; Schwebel, *Yearbook*, 1982, 91.

¹¹ ILC, *Report*, 1991; International Law Association, *Report of the Fifty-Second Conference—Helsinki*, ILA, London, 1967, 480, 486-89. See also Miriam Lowi,

"International Rivers Law and Riparian/Co-Basin State Rights," unpublished paper (courtesy of the author, for which thanks), 10-12.

12 I was instructed in these matters by my colleague Prof. Dellapenna in various communications.

13 ILC, *Yearbook*, 1988, vol. II, Part Two, 105; EC, *Official Journal of the European Communities*, 26 January, 1980, no. L, 44 (cited in Barberis, 33).

14 Virtually any introductory geology textbook will provide a definition of groundwater or aquifer; for more specialized treatment see Bredehoeft, J.D., Papadopoulos, S.S., and Cooper, H.H., "Groundwater: The Water-Budget Myth," and Siever, R., and Stumm, W., "Quality of Water—Surface and Subsurface," in *Scientific Basis of Water-Resource Management*, 51-71; U.N., Dept. of Economics and Social Affairs, *Groundwater in Africa*, New York, 1973, 1-12; regarding groundwater in Jordan, see El-Naser, H., *Hydrogeologie und Umwelt/ Groundwater Resources of the Deep Aquifer System in Northwest Jordan*, Wurtzburg, 1991, 6-38, and Salameh, E., Rimawi, O., and Bannayan, H., *Groundwater Artificial Recharge in Jordan*, University of Jordan, Water Research and Study Center, Amman, April 1991, 1-20; and for more general treatment see Postel, S., *Last Oasis. Facing Water Scarcity*, Norton, New York, 1992, and Hillel, D.J., *Out of the Earth. Civilization and the Life of the Soil*, New York, 1991.

15 On groundwater law, see the following sources: Barberberis, *Groundwater*, 1-64; Caponera, *Principles*, 153-4, 247-59; Tecklaff, L.A., and Tecklaff, E., "Transboundry Groundwater Pollution: Survey and Trends in Treaty Law," *Natural Resources Journal*, vol. 19, 1979, 629-667; Tecklaff and Utton, A.E. *International Groundwater Law*, London, New York, 1981, *passim*; Hayton, R.D., "International Aquifers and International Law," *Water International*, vol. 6, 1981, 158-65, and "The Law of International Aquifers," *Natural Resources Journal*, vol. 22, 1982, 71-93.

16 *Transboundary Groundwaters: The Bellagio Draft Treaty*, revised and augmented by R.D. Hayton and A.E. Utton, *Natural Resources Journal*, summer 1989, 663-722—this is a full authoritative copy of the Draft with extensive commentary; ILC, *Report*, 1991; McCaffrey, S.C., "Background and Overview of the International Law Commission's Study of the Non-Navigational Uses of International Watercourses," *Colorado Journal of International Environmental Law and Policy*, Vol. 3, No. 1, Winter 1992, 17-29 (henceforth "Overview"); *The Bellagio Draft Treaty Concerning Transboundry Groundwater* (a second copy of the treaty for collating purposes was made available to the author by Dr. Boulos Kefaya, Ministry of Planning, Jordan, for which the author wishes to express his appreciation).

17 This summarized treatment of Islamic water law is based largely (but not exclusively on the following sources: Mawardi, Ali b. Habib al-Basri, *Al-ahkam al-sultaniyya*, Cairo, Dar Ashabab li Tibaa^c, 1983 (Henceforth *Al-Ahkam*); Al-Rahbi, ^cAbd al-^cAziz b. Muhammad, *Fiqh al-muluk wa mitlah al-ritaj al-mursad*, Al-Irshad Press, Baghdad, 1973 (Henceforth *Fiqh al-muluk*); Al-Nabban, Muhammad Faruq, *Al-itijah al-jama'ci fi'l tashn'ci al-iqtisadi al-Islami*, Dar al-Fikr Press, Cairo, 1970 (Henceforth *Al-itijah*); Adam, Yahya Ben, *Kitab al-kharaj*, A. Ben Shemesh, ed. and tr., Brill, Leiden, 1967; Caponera, D.A., *Water Laws in Moslem Countries*, FAO, I, irrigation Papers No. 20/21, 1973, and *Principles of Water Law and Administration, National and International*, Rotterdam/Brookfield, 1992; Teclaff, L.A., *Water Law in Historical Perspective*, New York, 1985; Wilkinson, J.C., "Muslim Land and Water Law," *Jouranal of Islamic Studies*, I, 1990, 54-72 and "Islamic Water Law With Special Reference to Oasis Settlement," *Journal of Arid Environment*, i, 87-96 and *Water and Tribal Settlement in Sourheast Arabia*, Oxford, 1977; Watson, A.M., *Agricultural Innovation in the Early Islamic World*, Cambridge, 1983; Lambton, A.K.S., *Landlord and Peasant in Persia*, Oxford, 1969 and "Aspects of Agricultural Organization and Agrarian History in Persia," *Handbuch der Orientistik. Wirtschaftsgeschichte des Vordern Orients in islamischer Zeit*, pt. 1, 264-79; Mazaheri, A., *La Civilisation des Eaux cachees . Traite de l'Exploitation des eaux souterraines compose en 1017 a.d. par (Mohammad al) Karagi*, Universite de Nice, 1973; Norvelle, M.E., *Water Use and Ownership According to the Texts of Hanbali Fiqh*, M.A. thesis, McGill University, 1974; and Schacht, J., *An Introduction to Islamic Law*, Oxford, 1965 (second impression); EI², "Ma"; Saliba, S.N., *The Jordan River Dispute*, The Hague, 1968, 46-112.

18 Lloyd, Dennis, *The Idea of Law*, London, 1966, 201-2; Maktari, *Water Rights*, 6-7; Wilkinson, "Muslim Land and Water Law," 54-56.

17 On this issue see Caponera, *Principles*, 61-2, 73-4, 80-84, 98-100, 139-44, 159-60, 183-86, 201-03, 212-13; Clark, S.D., "Tensions Between Water Legislation and Customary Rights," (henceforth "Customary Rights") *Natural Resources Journal*, vol. 30, Summer 1990, 503-20; McCaffrey, "Water, Politics, and International Law."

20 Clark, "Customary Rights," 506 for the quotation and examples; on this issue see also IDI, *Annuaire de l'Institut de Droit International*, vol. 49, Part Two, Salzburg Session, Sept. 1961, Basel, 1961, 381-84 and vol. 58, Part One, Athens Session, Sept. 1979, Basel/Munich, 1980, 197ff.

21 On the international dimensions of *sharia*, see Muhammad b. al-Hasan al-Shaybani, *Sharh kitab al-siyar al-kabir*, Salah al-Din al-Munajjid, ed., 3 vols. Cairo, 1958-60, which is a standard classical work on Muslim law and international relations; on what makes *sharia* compatible with modern international law and the Muslim adoption of western systems of foreign relations, see T. Naff, "The Linkage of History and Reform in Islam: An Ottoman Model," *In Quest on an Islamic Humanism*, A.H. Green, ed., Cairo and London, 1984, 123-138; "The Ottoman Empire and the European State System From the Fifteenth to the Nineteenth Centuries," *The Expansion of International Society*, Hedley Bull and Adam Watson, eds., Oxford, 1984; and "Reform and Diplomacy in the Reign of Selim III," *Journal of the American Oriental Society*, vol. 83, no. 3, July-Sept., 1963.

22 Wilkinson, "Muslim Land and Water Law," 56.

23 Sura xxi, 30, in A.J. Arberry, *The Koran Interpreted*, London, vol. II; on the hadith see Mawardi, *al-Ahkam* Cairo, 158; Yahya Ben Adam, *Kitab al-kharaj*, 76; (both the sura and hadith are cited by Maktari, *Water Rights*, 22); references to water in the Quran are in Water Authority of Jordan, *The Qur'an and the Water Environment*, selections from the Quran, distributed by the Royal Scientific Society of Jordan (cited also by Brooks, D.B., "Adjusting the Flow: Two Comments on the Middle East Water Crisis," *Water International*, vol. 18, no. 1, March 1993, 35-39)

24 *al-Ahkam*, 156; also, Yahya Ben Adam, *Kitab al-kharaj*—Yahya Ben Adam added that in the case of the Mahsur torrent, the Prophet ruled that palm tree owners had a right to the water to the depth of two heels, and that sowers have a right to water as high as two straps of the sandal, after which the water is sent to those lower down, 71-72; on springs, rivers, and selling surplus water, see 71-76.

25 al-Rahbi, *Fiqh al-muluk*, 636-638, 646-48; Al-Nabhan, *Al-itijah*, 247; (in the *hadith* the word "Muslims" is used instead of "mankind," but it is commonly taken to connote the latter and is so used); also regarding common or communal ownership of water, see Wilkinson, "Muslim Land and Water Law," 60-62, and "Islamic Water Law," 87-89; Maktari, "Water Rights," 13-16; EI², "Ma'," 860-61.

26 Ruxton, F.H., *Maliki Law*, Luzac, London, 1916, 255-56; al Rahbi, *Fiqh al-muluk*, 651; Yaha Ben Adam, *Kitab al-kharaj*, 75-77.

27 This profile is based on the sources contained in notes 14-24 above.

28 On this issue see Dellapenna, "International Water Management."

29 Wilkinson, "Muslim Land and Water Law," 64-67; see also EI², Ma', 860-61, 878.

30 McCaffrey, "Overview," 22-23, 28; see also McCaffrey, "The Law of International Watercourses: Some Recent Developments and Unanswered Questions," *Denver Journal of International Law and Policy* vol. 17, 1989. Stephen McCaffrey was a member of the International Law Commission and Special Rapporteur of the ILC until 1992.