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Indigenous Approaches to Water Conflict Negotiations and Implications for International Waters

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Abstract. As the literature on international water negotiations continues to grow, one resource of expertise remains untapped – that of indigenous populations who have historically inhabited arid regions throughout the world. This article investigates how indigenous peoples of two drylands regions – the Berbers of the High Atlas Mountains and the Bedouin of the Negev Desert – approach negotiations brought about by water scarcity and fluctuation, and their methods are described in the context of current international hydropolitics. Lessons learned from these indigenous methods for conflict resolution which are applicable to modern problems include the following: 1) Allocate time, not water. Berber water management quantifies water in units of time rather than in units of volume. This method allows for local management of a fluctuating supply, and provides a means for a water market without storage structures. 2) Prioritize different demand sectors. Berbers and Bedouin prioritize demand differently, but each provides a hierarchy of importance. This allows for less important uses to be cut off throughout a valley during low flow regimes, rather than entire down-stream villages, and protects investments in infrastructure. 3) Protect downstream and minority rights. Berbers allow only traditional diversion structures which, through their "inefficiency," allow for flow to continue downstream, while Bedouin concepts of equity address honor and pride, as well as right and wrong. 4) Alternative Dispute Resolution (ADR). Each group has sophisticated mechanisms of dispute resolution, from which modern international management might benefit. Techniques include recognition of a defined water authority, and "shared vision" exercises. 5) The "*sulha*." Both Berbers and Bedouin follow this Islamic practice of a ritual ceremony of forgiveness. Once the ceremony is performed, the dispute may not be discussed – it is as if it never occurred.

Keywords: water resources, Berbers, Bedouin, conflict resolution, indigenous peoples, international waters

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The watersheds of the world's 261 transboundary rivers cover almost half of the land surface of the earth (Wolf et al. 1999). Access to clean freshwater – the only scarce resource for which there is no substitute, over which there is poorly-developed international law, and the need for which is overwhelming, constant, and immediate – has driven its share of political tensions. Water has exacerbated relations around the globe, most-famously in the arid and hostile Middle East, but also throughout Africa and Asia. "Water" and "war" are two topics being assessed together with increasing frequency, and the study of "water conflict resolution" takes on ever-increasing immediacy.

As the literature on water conflict negotiations continues to grow, one resource of expertise remains untapped – that of indigenous populations who have historically inhabited arid regions throughout the world. This paper investigates how indigenous peoples of two drylands regions – the Berbers of the High Atlas Mountains and the Bedouin of the Negev Desert – approach negotiations brought about by water scarcity and fluctuation conflicts.

This work addresses the following questions: Recognizing that delineating water allocations are a major obstacle to successful negotiations, what criteria are used to allocate scarce water resources and who has priority rights when the supplies decrease? Who in the community takes on the role of facilitator, mediator, or adjudicator? What dynamics in negotiations help ameliorate conflict? The answers to these questions are described and applied within the context of current international hydropolitical negotiations.

Methodology

During the summer of 1997, I had the opportunity to spend approximately one month each in the High Atlas Mountains of Morocco, mostly in the M'goun and Bougmez valleys, and in the Negev Desert in Israel. Both these arid regions are the homes of indigenous peoples who have lived in the region for centuries, if not millennia – the Berbers and the Bedouin respectively. My research focused on understanding how each of these communities negotiate over their respective water conflicts, and how these methods might be applied to larger scale water conflicts between modern nations.

My methodology was straightforward – I traveled within each community and asked two sets of questions as widely as possible: 1) What community water disputes are they aware of and how were they resolved, 2) How, using their methods of resolving water conflicts, might they resolve current disputes between nations, such as those along the Jordan, Nile, or Ganges rivers. (For more information on these and other modern international disputes, see the other articles in this special issue, or the annotated bibliography of the Transboundary Freshwater Dispute Database at

<http://terra.geo.orst.edu/users/tfdd/>) I tried to dig beneath the inherent clash between traditional and modern approaches to water management – each community is embroiled in disputes with the nation in which each resides; the Berbers with the Moroccan government, and the Bedouin with the Israelis.

This then is not a study that tries to place each community within an anthropologic or sociologic construct, nor does it pretend to answer questions larger than those posed. It is rather a request for advice – what can each people offer the international community to help guide co-riparian nations towards hydro-cooperation and away from the dangers of hydro-conflict, while yet recognizing the difficulties inherent in transposing lessons between locations or scales.

Geographic Background[1]

The M'goun Massif lies in the heart of the High Atlas mountains, where peaks range from about 2,500 m to more than 4,000 m, and precipitation rates are about 500–600 mm per year (Benchirifa 1988). Land tenure of the Berber inhabitants of the region is divided distinctly by elevation – permanent villages, with extensively terraced irrigated agriculture, begin immediately below the outlet of permanent springs and generally follow the topography of the resulting streams. The lands above the springs are used mainly for seasonal grazing, because of both steeper slopes and the lack of stable water supplies (see Welch 1996 for more details).

Organization and land-ownership of the villages is by tribe, designated by the prefix "Ait-" (people of), followed by either a common ancestor or a place of origin. The tribal unit is broken into roughly five clans, then sub-clans, and finally to extended families or lineages (see Hart 1984 for more detail). In this setting, the types of water disputes are those that one finds generally in small-scale canal irrigation: allocations between villages which share a main canal, allocations within villages between lineages and/or individuals, timing of irrigation, and maintenance of the canal system.

The Negev Desert is a very different environment, where an average of 100–200 mm rain falls, primarily in flashy winter storms (there is so little rain that in some years, there is more dew than rain) (Abu-Rabia 1994). The desert is 12,500 km^2 in area, comprising 60% of Israel's land surface. The term "Bedouin" refers to a nomadic or semi-nomadic lifestyle based on seasonal migration, cultivation, and animal husbandry within the deserts of the Middle East. The 60,000 or so Bedouin of the Negev Desert, belonging to some thirty tribal units (Abu-Rabia 1994), have been undergoing a process of sedentarization over the past 100 years, with an attendant dramatic shift

in land and water tenure, due both to indigenous and exogenous forces (as documented in Kressel et al. 1991 and by Meir 1996). Traditionally (pre-20th century), grain was grown through dry farming, and grazing land and whatever water was available (winter flash runoff and a few permanent wells) was common, tribal property. The shift from pastoralism to settled agriculture over the past 100 years has seen, along with the formalization of territorialism and private, permanent property, the re-establishment of ancient rainwater harvesting technologies, where as much runoff from winter storms within a micro-catchment as possible is diverted by channels to a series of small agricultural plots, and/or into cisterns, which can then be drawn from for human, animal, and/or crop use (see Bruins 1986 for details).

Different Islamic legal tenets apply to different water sources, basically divided by whether the water is "provided by God" – that is, it is from a natural surface or groundwater source which is available year-round – or whether it is "provided by man" – that is, the human labor which creates a cistern or the attendant canal system. "God-given" waters may not be bought or sold, and their use is available to all equally.[2] Conflicts over these waters, then, have traditionally been not over the waters themselves, but rather over peripheral issues such as the order tribes water at the wells, or the simple tensions inherent when large numbers of people and animals congregate (Kressel et al. 1991; Kressel 1997).

In the case of water collected through human endeavors, there can still be no charge for the water itself, but one may charge for the delivery, treatment, and/or storage of water. Nevertheless, one may never refuse drinking water for human needs from any source whatsoever. Conflicts over stored waters too are rarely over the waters themselves, but rather over property rights to a cistern and its canal system, priority rights to dams or diversions along a wadi, and/or rights to the surrounding property (Maktari 1976; Naff 1993).

Methods of Conflict Resolution

Berber and Bedouin approaches to water negotiations have similarities and differences. At the local level, as in the international realm, the issue of allocations and water rights is one of the most contentious, and consequently provides dangerous pitfalls in water negotiations at all scales. This section, then, describes the approaches each group takes with allocations and rights, as well as negotiation process techniques, with an emphasis on those most directly relevant to international waters. These approaches include: allocating by time, not quantity; prioritizing use; protecting downstream rights; and other process techniques.

Allocate Time, Not Quantity

International water agreements generally allocate shared water as an absolute quantity in volumetric terms. The Transboundary Freshwater Dispute Database includes a collection of 150 water-related treaties (see Hamner and Wolf 1998 for details). Wolf (1999) investigates the 49 of those which delineate a water allocation between nations, finding that nine simply divide water equally while the other 40 have specific volume allocations. This latter arrangement requires that one nation bear the full brunt of a fluctuating supply. In the unratified Johnston arrangements between the riparian states of the Jordan River, for example, Israel was to receive the remainder of the river's flow after each nation had received its set allocations. Generally, it is the upper riparian which receives this burden. It is easier to plan for delivery of a set amount to a lower riparian than it is for an upper riparian to try and consume a fixed amount and deliver the fluctuating remainder downstream.

Bedouins likewise use volumetric quantities in allocating water, especially from cisterns or other containers. A *shiber* is the distance from the outstretched thumb to the little finger, which in turn is divided into finger-width measures. Since these are linear measures, marked off on the sides of a container or along a rope dropped into the water, the corresponding volumes are different for different containers. But it is volume which is measured, allocated between family members and, occasionally, bought and sold.

In contrast, when the Berbers allocate water, they allocate by time, not quantity. This is true whether the allocation is between villages, between lineages (large extended family units), or between individual users. Allocation schedules among the Berbers have been described in detail in the literature by, for instance, Berque (1955) and Welch (1996). Some examples of how this works at different levels: Generally, if two villages share a canal, each village is allocated set days of the week – four days for the upstream riparian and three for the downstream riparian, for example.[3] Alternately, two villages might split days – I was told of a case of two villages where one had rights to divert water until the shadows of the valley wall reached the stream, then rights reverted to the other. Lineages within the villages then generally divide by days. Finally, individual users have irrigation rights for certain hours. These hours, which were measured by the sinking rate of wooden floats with holes of varying sizes before clocks were common, rotate during the day and from day till night.

Allocating by time allows for two benefits. The first is that it relegates micro-management of the fluctuations of the river to the smallest possible management unit – the individual user – thus spreading risk as broadly as possible. For example, when one has rights to one hour of irrigation, the irri-

gator himself plans for greater and lesser supply at the most local level. The alternative method of allocating a set volumetric amount would concentrate risk among those users selected to bear the burden of fluctuation. In a prior appropriation setting, for example, risk would be concentrated among the most-recent irrigators; in an international arrangement, all of the risk would fall to the users of one country.

The second benefit of time- over volume-allocations has to do with the potential of water markets. Economists have long advocated a degree of market structure for water resources to encourage greater efficiency of use (Merrett 1997). Allocating by a riparian rights doctrine, or by a historic rights doctrine with clauses to "use or lose" one's allocated water, provide no incentive for a user to conserve. However, if one is able to sell the portion of one's allocation that is saved through conservation measures for a greater price than the cost of conservation, it is argued that the "invisible hand" can then guide water to its most efficient use.

It is generally argued though, that a prerequisite for such a market is a storage structure that would act as a physical "bank," evening out flows and guaranteeing that supply will meet demand. Ostrom (1992) in fact, has suggested that a market is impossible without a storage structure. This may be true if water is to be bought and sold volumetrically, but it is not true if the market is for time. Risk is inherent in a time-based allocation and thus one can buy and sell time without the need for storage – all parties understand that each block of time will sometimes allow for more water and sometimes less. Other obstacles sometimes prevent the establishment of a market – the Berbers I spoke to felt the idea of buying and selling water was both repugnant (like buying and selling one's children, one interviewee suggested to me), and contrary to the tenets of Islam. As mentioned above, Bedouin buy and sell water from containers or cisterns, but not from a natural well or river. In the Dra'a Valley of southern Morocco, however, a thriving water market does exist and apparently has for some time (Hammoudi 1985). The commodity bought and sold is time, not water, which circumvents both the need for storage and Islamic code.

How might the shift in allocations from volume to time be applied to the international setting? The suggestion of one villager that, "Ethiopia be allocated one day of Nile River flow and Egypt six (any more for Ethiopia would lead to war)," is clearly impossible. But looking for other ways to share the risk of fluctuating supplies is not. Today, real-time models of watersheds are possible with sophisticated radio-operated gauging stations and monitoring through remote-sensing techniques. Thus, an allocation based on percentages of real flow rather than firm volumes of hypothetical flow is possible, even in large, international basins. A switch to percentages would not only have the

same risk-dispersion effect that a time-based system might have, allowing for management of the river's fluctuations throughout the basin, but it would also allow for markets between users even without storage facilities.

Prioritize Use

As mentioned above, international water treaties generally tend to allocate a fixed amount to each state. Those that do not designate one state to receive a fluctuation in supply simply fly in the face of the hydrologic reality of a fluctuating river. In the classic case of how not to divide a river, the Colorado allocations under-estimated available flow when the river was divided between the upper and lower riparian states, leaving a perpetual shortage in the fixed US obligation to Mexico.

Along with designating one state to accept an uncertain supply, an alternative method of allocating a fluctuating supply is on the demand side – that is to prioritize the use or user. The historic rights doctrine does this by giving progressively lower priority to progressively more-recent users, regardless of how the water is put to use. Prior uses are generally protected in international treaties, although more recent uses are not put at risk of losing their supply.

A method the Berbers use to deal with a fluctuating supply is to prioritize the use to which the water is put. Highest priority is for drinking water for humans, followed by drinking water for animals – both of these uses are sacrosanct and neither may be denied anyone for any reason at any time. The next priority is irrigation water which flows through the canal system. Water to mills is the next priority. In years of low flow, for example, water may be diverted to fewer mills at a time, alternating between them. Families that own a mill which is closed can still have its grain milled at another family's mill, paying in grain for the service. The last priority is irrigation water brought to land through modern means. A villager might use a pump to bring new lands into cultivation for example, but his or her lands would be the first to be cut off in years of low flow.

Bedouin prioritize in a similar manner, where water to quench thirst, is an unalienable right, and may not be refused from any water source. This is followed by domestic use, including watering animals, then irrigation of agricultural lands, and finally commercial and industrial purposes. Misuse or waste of water is forbidden.

For the Berbers and Bedouin with whom I spoke, some results of the lack of prioritizing uses in the international setting seemed ludicrous. On the Nile dispute between Ethiopia and Egypt, for example, it seems difficult to rationalize Ethiopia's not being able to develop its water resources for drinking or food crops so that Egypt can continue to grow cotton for export. In this

context, it also troublesome to justify Israeli swimming pools at the expense of Palestinian drinking water.

International water treaties have prioritized use only occasionally, generally focusing instead on allocating fixed amounts. Only four treaties differentiate between types of use: the Mekong Agreement gives domestic and urban uses a preference, for example. The two sets of boundary waters agreements between the USA and Canada, and the USA and Mexico prioritize differently, probably due to the amount of water available along each border region: the former prioritizes by domestic and sanitary, navigation, and power and irrigation; the latter gives descending weight to domestic, agriculture, electric power, other industry, navigation, fishing, and other beneficial uses. The 1960 Indus Waters Treaty lists its order of priority as domestic, non-consumptive, agriculture, and hydro-power. (Notably absent in all of these lists are any instream or other environmental requirements.)

Clearly, quantifying various uses in the international setting over the life of a treaty would be extremely difficult. Drinking water for example, is determined by population, which constantly changes at various rates depending on birth, death, immigration, and emigration rates. Nevertheless, those treaties that do prioritize use show that it is possible. Even fixed allocations might acknowledge uses of lesser and greater importance. Gleick (1996), for example, defines basic human needs, regardless of climate, as 50 liters per capita per day for personal use alone (18.25 m^3/yr.). Shuval (1992) argues for a minimum baseline allocation in a possible treaty between Israel, West Bank Palestinians, and Jordan, based on a per capita allotment of 100 m^3/yr. for domestic and industrial use plus 25 m^3/yr. for agriculture. Wolf (1993) likewise advocates a needs-based approach for the Jordan River watershed, giving drinking water the highest priority for allocations. He plans for total urban needs of 100 m^3/yr. per person, and extrapolates to the point in the future where all of the basin's 2,500 MCM/yr. has to be allocated first to these needs, or, in other words, when the regional population reaches 25 million.

Incorporating prioritized uses across international boundaries would address a critical issue in transboundary issue in allocations – the question of equity. As mentioned above, as quantity fluctuates from year to year, one country is usually designated to take on the full risk of fluctuating supply. By prioritizing uses, Berber and Bedouin management has shown that risk can be distributed more-equitably by allowing critical uses *among all parties* to have high priority in times of fluctuating supply.

Protect Downstream and Minority Rights

In the absence of a treaty, upstream riparian states have a hydrological advantage in developing a river. In the absence of political constraints to

the contrary, these upstream states have occasionally abused this advantage. India was able to divert a disproportionate amount of the Ganges River to flush the port of Calcutta for years for example, even to the objection of downstream Bangladesh. Similarly, the Turkish Southeast Anatolia Project on the Euphrates and US development of the Colorado proceeded despite the objections of downstream riparians on each respective stream (Beach et al. 2000).

Among the Berbers, two villages often share one major irrigation canal and entire series of villages depend on single streams. Similar to the international setting, these situations allow for the potential abuse by upstream villages, particularly given the recent introduction of new technologies for diversion such as artificial pumping and cement canal construction.

This abuse does not appear to occur, at least not in the area of this research. The *hak'm*, or regional judge of the M'goun valley explained to me that valley residents are very aware of the potential for abuse by an upstream riparian, and measures are taken to prevent abuse. When two villages share a major canal for example, the canal itself is manifestation of an agreement where delivery to the downstream village is explicit – downstream investment in irrigation infrastructure clearly depends on a guarantee of future deliveries. As mentioned above, the villages divide water by time – perhaps four days per week for the upstream village, three days to the downstream village. These agreements are so imbedded in history that deviation from them would be immediately apparent, harmful and, consequently, completely at odds with tradition.

The flow to downstream villages of water in a stream is protected in a very different way: the use of modern materials for a canal intake is quite simply forbidden by regional law. Even though cement may be used for a canal itself to prevent seepage, only traditional methods of piled rocks may be used for the intake itself. The inherent "inefficiency" of these traditional intakes guarantees that a substantial portion of the stream will reach downstream villages.

In the traditional Bedouin system of watering at permanent wells, "downstream" translates as smaller or weaker. A common expression is, "count your men before you get to water," reflecting that larger tribes generally watered first (Kressel 1997). Small redoubts overlooked many wells, where fighters watching over the process would be far enough away not to be seen, but close enough to assist the tribe if needed.

Yet the concept of equity and the protection of the rights of the weak are regular and recurrent themes in Bedouin narratives of traditional practices. One story I was told described how, after two brothers divided a parcel of land, a well was found on one of the parcels. When the well-less brother

insisted on a portion of the water, the two brought their plight to a local judge who found that, while the well belonged solely to the one brother, they should share the water for the sake of peace in the family. This tale was used to explain to me that solutions are not solely about right and wrong, but also about preserving honor, pride, and peace amongst all the disputants.

Of the people I interviewed in both Morocco and Israel, Turkish and Indian activities on their respective rivers did not make good sense.[4] This is generally true in the international community as well. Recognition and protection of downstream rights is present in most treaties – abuse generally comes about only in the absence of an agreement. Nevertheless, Berber and Bedouin practices remind us that downstream and minority rights not only protect investment in water infrastructure, but are manifestations of the fundamental question of equity in shared water resources.

Alternative Dispute Resolution

Alternative Dispute Resolution (ADR) refers to "a wide variety of consensual approaches with which parties in conflict voluntarily seek to reach a mutually acceptable settlement" (Bingham, Wolf and Wohlgenant 1994). It generally seeks to move parties away from zero-sum, or distributive solutions, towards those in which all parties gain – positive-sum or integrative. The term ADR, and the methods generally described, are no more than twenty years old in western dispute resolution literature. In defining the methodologies for ADR, indigenous processes are rarely drawn upon. Both Berbers and Bedouin have apparently been practicing ADR for centuries. Some of the "modern" techniques that they use include.

A clearly defined water authority

ADR distinguishes between unassisted negotiations – those between the parties of a dispute alone – and assisted negotiations, where an individual is designated as the facilitator, mediator, or adjudicator. Both Berbers and Bedouin societies include members who assist in the process of conflict resolution.

Berque (1955), Gellner (1963) and others describe the *marabout*, a Berber mediator/facilitator respected for wisdom, holiness, and the ability to resolve conflict. While the *marabout* have disappeared as a dominant force in Berber dispute resolution, clearly defined authorities at all levels of water conflict management continue to function. Within each village, an *a'alam* or *naib*, is chosen to manage the irrigation schedule and to resolve internal disputes. Within the Bougmez and M'goun valleys, this authority is chosen generally through their ability to resolve disputes equitably, and rotates from family lineage to family lineage. (I did hear of one case where the *a'alam* was chosen

for charity reasons – the candidate had lost an arm in an accident and the village felt that he could benefit from the small portion of grain which came with the job.)

If two villages are in a dispute, initial attempts at resolution are between the *a'alam* from each village. If necessary, the heads of each lineage will also gather to help. If this group is unsuccessful at resolving the dispute, appeal can be made to the regional *hak'm* – a traditional judge who adjudicates using a combination of Islamic law and Berber tradition. If either party is unhappy with the resolution worked out with the *hak'm*, an appeal can be made to the regional court system and the modern Moroccan legal structure.

The Bedouin justice system is quite similar. Kressel (1993) describes three aspects of relevant law – customary, religious, and civil. Traditionally, a judge (*qadi*) was not a permanent position, but was appointed as his particular expertise was required. Other Islamic societies nearby designate *nawbas* specifically to adjudicate water rights, but since traditional pastoralism relied on permanent wells and not the allocation of flows, such a position did not exist among the Negev Bedouin.

One of the greatest gaps in international water dispute resolution is the lack of just such a recognized authority. Wescoat (1992) describes the elaborate process by which the International Law Commission, the United Nations legal body, has taken to design a draft code for international waters. The 24-year effort, only recently approved by the General Assembly, includes terms defined by politics rather than science, vague and contradictory doctrines, and no enforcement mechanism. Even when approved, international law applies only to States, and therefore ignores many of the ethnic minorities who might claim water rights. Furthermore, the International Court of Justice requires not only that both parties to a dispute agree to the Court's jurisdiction, but also that they agree to the specific point of law to be decided. Given these constraints both on legal guidelines and on the venue for legal resolution, it is hardly surprising that water treaties are rarely explicitly informed by general legal principles, or that the International Court of Justice has decided only a single case regarding international water law.[5]

How might the international community adopt a clearly defined water authority? Obviously, some Berber approaches are not feasible on an international scale. One *a'alam*, when asked why his authority was accepted, told the story of how a villager was brought before him for refusing to pay a fine for irrigating during another villager's time. The *a'alam* licked one finger and held it up to the wind. "You will pay the fine by the time my finger is dry," he told the villager, "or we will burn down your house." Similarly, the Bedouin

concept of the largest tribes approaching the well first may not translate quite in the way we might wish.

It is less far-fetched to envision an international water dispute authority, perhaps with the financial clout of the World Bank and the legal authority of the United Nations, with staff trained both in water resources and in dispute resolution. With real authority and authorization to resolve conflicts in other than the win-lose context of a legal setting, such a body could be a critical component in international water management.[6]

ADR process techniques

Alternative Dispute Resolution theory describes a toolbox of "process techniques" – the methods by which a facilitator or mediator helps guide negotiations through to an acceptable agreement (see Kaufman 1996 for background and details). Many of these techniques, generally described in the ADR literature as modern Western methods, have apparently been used by indigenous people for centuries.

The *hak'm* for the M'goun Valley, who sits at the *qaidate* in Qa'alat M'gouna for example, told me that water disputes reached him only rarely, and that he remembered only one appeal which went beyond his office. He attributed this to a series of process techniques, including "shared vision" exercises.

One method by which ADR practitioners help shape the direction of a negotiation is to begin by asking participants to share their individual views of what the future might look like if negotiations were both successful and unsuccessful (Kaufman 1996). These "shared visions" can then be referred back in the course of negotiations to remind participants how critical it is for them to reach agreement.

The *hak'm* at Qa'alat M'gouna uses these exercises regularly, both in water and non-water negotiations. He told me that the exercises are useful to defuse anger when disputants first come into the room; that the first thing each wants to do is to vent, usually in quite emotional terms, about their respective grievances. Through shared visions, the *hak'm* puts the dispute in the larger context of their shared histories and values.

Threat of "BATNA"

Fisher and Ury (1981) coined the term "BATNA" – the best alternative to a negotiated agreement – and argue that anyone involved in negotiations should be aware of what their alternatives might be through alternative venues. If one has a good chance of reaching their objective cost-effectively in court for example, their incentive in riding out the difficulties of negotiations may not be high enough to see the process through.

The *hak'm* at Qa'alat M'gouna uses the BATNA concept in the opposite sense, that is to keep parties involved in negotiations. He told me he often reminds disputants that the alternative to reaching agreement in his office is to appeal to the regional civil court in Ouarzazat. In the modern Moroccan structure, he reminds them, the solutions are not only zero-sum – that is, one party's gain would be the other party's loss – but that judgment and agreement my not be based on Berber tradition. Keeping disputants aware of this BATNA, as the *hak'm* suggests, regularly gives them new incentives to continue through difficult negotiations.

In Bedouin agreements too, it is important to maintain a critical balance between rights and honor.[7] By focusing strictly on rights as in a Western court, "someone always loses." An official in the Bedouin land court system described similar experiences as the *hak'm*, where the disputants who appeared before him would go to great lengths to keep the matter from proceeding to the Israeli justice system – a fact that the official could use to help induce cooperation.

The sulha

According to Islamic practice, once a wrong has been committed, a ritual ceremony of forgiveness, a *sulha*, might be performed. Both Berber and Bedouin communities share this Islamic custom, which consists of private, often mediated negotiations of redress between the affected parties, followed by a public declaration of forgiveness and usually, a festive meal. Once the *sulha* is performed, the slate is wiped clean – it is as if the dispute never happened. The agreement is legally binding on both the individuals and on the community. Grudges are dissuaded and reference to past disputes may not be made to gain position in a current conflict (see Smith 1989; Irani 1999 for more detail).

The international community seems to be lacking in just such a ritual ceremony of forgiveness. The negotiating process of many transboundary agreements is secret – at best, a televised signing ceremony may take place – and accord over an issue such as water, generally considered un-newsworthy, may take place without any public notice at all. A public ceremony would allow the community affected by a dispute – the stakeholders on both sides – to celebrate its resolution and thereby take ownership of seeing to its implementation.[8]

Conclusions

This work investigates the water negotiation practices of the Berbers of the High Atlas Mountains and the Bedouin of the Negev Desert, in the search

for guidelines to help resolve water conflicts between modern nations. While doing so, I fully recognize that transposing such guidelines from location to location or from the local to the international setting has inherent limitations: these approaches to resource management were developed within particular social constructs and physical environments; they apply to small scale local settings where near-total transparency prevails; and they are adhered to by relatively homogeneous populations with widely shared values – none of which is true of international basins. Nevertheless, I feel that these experiences are useful to add to the global record of approaches to problem solving, such that they might be drawn upon and modified where appropriate.

With that in mind, the following questions were addressed within each community: What criteria are used to allocate scarce water resources? Who has priority rights when the supplies decrease? Who in the community takes on the role of facilitator, mediator, or adjudicator? What dynamics in negotiations help ameliorate conflict?

Lessons learned from these indigenous methods for conflict resolution which are applicable to modern negotiations along international waterways include the following: 1) Allocate time, not water. Berber water management quantifies water in units of time rather than in units of volume. This method allows for local management of a fluctuating supply, and provides a means for a water market without storage structures. 2) Prioritize different demand sectors. Berbers and Bedouin prioritize demand differently, but each provide a hierarchy of importance (ie. water for drinking, flocks, irrigation, and mill generation). This allows for less important uses to be cut off throughout a valley during low flow regimes, rather than entire down-stream villages, and protects investments in infrastructure. 3) Protect downstream rights and the rights of the weak. Berbers allow only traditional diversion structures which, through their "inefficiency," allow for flow to continue downstream. Modernization of inflow is not allowed, specifically to protect the downstream user. Bedouin solutions are based on concepts of equity, balancing right and wrong with peace and honor. 4) Incorporate the tools of Alternative Dispute Resolution (ADR). Each group has sophisticated mechanisms of dispute resolution, from which modern international management might benefit. Techniques include recognition of a defined water authority, and "shared vision" exercises. 5) Incorporate a ceremony of forgiveness. Both Berbers and Bedouin follow the Islamic practice of a ritual ceremony of forgiveness, a *sulha*. Once the ceremony is performed, the dispute may not be discussed – it is as if it never occurred.

Given the lack of any international water authority, the poorly-developed nature of international water law, and the decreasing availability of an adequate and clean water supply, we might learn much from the indi-

genous people of drylands who have spent millennia developing sophisticated methods for managing their scarce and fluctuating water resources.

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Notes

1. All aspects of the two communities, their geographies, histories, anthropologies, and systems of rights, are infinitely more complicated than presented here. Again, the emphasis of this work is international water; the reader interested in more information about Berbers and Bedouin is urged to look up the referenced literature for more details.
2. The famous first scene in *Lawrence of Arabia*, which seems to have shaded the perceptions of many vis-à-vis Middle East water tensions, in which a hapless traveler is shot for drinking from another's well, simply would not have happened. The well and its water would have been accessible to anyone.
3. A stream will be at the lowest elevation of a valley, and, from the point of diversion, an irrigation canal has to move regularly closer to the stream to maintain flow by gravity to the fields below it. Because one can only irrigate between the canal and the stream, a downstream village would usually have less irrigable land than an upstream village sharing the same canal.
4. It should be noted both that Turkey, Syria, and Iraq have recently renewed negotiations on the Euphrates, and that India and Bangladesh signed a treaty on the Ganges in December 1996.
5. The ICJ came into being in 1946, with the dissolution of its predecessor, the Permanent Court of International Justice. That body did rule on four international water disputes during its existence from 1922–1946. The one case decided by the ICJ was a 1997 ruling on the Gabcikovo Dam on the Danube.
6. It should be noted that authority is only one problem in international water management. As important, is the fact that there is not enforcement mechanism for agreements which are reached. Of the treaties in the Transboundary Freshwater Dispute Database, 80% have no enforcement mechanism whatsoever (Hamner and Wolf 1998).

7. Smith (1989) draws wonderful imagery of these two concepts, as personified in the Talmud by Moses, the strict legalist, and his brother Aaron, the peace-seeking adjudicator. In Smith's text, as in the Talmud, "Aaronic" mediation is preferred.
8. To some degree, this concept is being introduced to the international community. Irani (1999) describes a *sulha* which was carried out between the Christian and Muslim communities in Beirut. The interviewees in Smith (1989) argue that, while the problems between Israelis and Palestinians are too great to be dealt with in a simple ceremony, the principles of *sulha*, balancing rights with honor, might be applied.

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