

# ***Looking Beyond (and Below) Institutions: The Role of Cultural Values in Sustaining Water Resources.***

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Conceptual approaches to understanding water resources management include an emphasis on management, institutions, and environment. Each of these has proven important in stimulating reforms and building capacity for more effective and sustainable water management. A values approach offers a similarly novel way of understanding, and improving, water policies and management practices. The approach applies concepts from environmental ethics and cultural studies to focus on the often hidden values which motivate water behavior. The example of the Santa Fe River (New Mexico, USA) illustrates how deeply held utilitarian values about nature are reflected in policies which are regarded as unsustainable from a scientific perspective. Strong institutions enforce and reward private water rights and exacerbate the unsustainable water practices. Analysis of the Santa Fe case suggests the need for an environmentally-oriented water ethic, but changing values is a complicated process. While there are many potential and complementary ways to influence water values, the most promising avenue is governance arrangements that include a broad range of stakeholders, including environmental voices. By acknowledging values and ethics as an explicit dimension of water management, institutions can function more flexibly and water use might become more sustainable.

KEYWORDS: *culture, ethics, values, environment, governance, Santa Fe River*

## INTRODUCTION

Recent decades have witnessed a dramatic shift in the way water resources are conceptualized and managed. Among the many conceptual innovations that have contributed to more sophisticated, and I think more effective water management, three trends stand out: (1) the rise of management awareness applied to water infrastructure and ecosystems, (2) the development of institutional economics and the concept of social capital, and (3) growing concern about environmental sustainability, particularly in the face of climate change. A fourth trend which may also be emerging, and is the topic of this paper, is an understanding of cultural values and ethics as a driving force in determining human behavior around water, the policies governing water use.

A brief review of the three recent trends will provide a context for describing the Ethics Perspective and why I believe it offers an important corrective to the theory and practice of natural resources management and common property studies.

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*Management.* In 1984 when the International Irrigation Management Institute (now International Water Management Institute) was established in Sri Lanka, its very existence symbolized a shift from the engineering dominance of the past. The application of management science was seen as the missing ingredient which, if properly integrated, would help realize the productive potential of high cost irrigation investments in the developing world (Coward 1980, Wickham 1985, Chambers 1988, Korten and Siy 1988) . The management orientation was a revolution for the irrigation sector, but not for the water supply sector where the principles of business management had long been familiar, if more in theory than in practice. The discipline of “water resources management” which emerged about this same time, provided a framework not only for linking the sectors of water supply and irrigation, but also for legitimizing management principles as a necessary and unifying set of principles. Now the diverse uses of water could be accounted for through a common currency of water volume, within a common spatial framework of the water basin.

*Institutions and Social Capital.* The physical framework of the water basin and the conceptual framework of integrated management could take form due to the theoretical advances of institutional economics and the concept of social capital. World Bank economists sought to “get the prices right” (Dinar 2000; Johannson 2000) while the focus on price incentives was tempered and enriched by the empirical work of Elinor Ostrom and her colleagues documenting the critical roles played by institutional rules and organizational structures (Ostrom et al 1993) e.g., in the design of irrigation associations (Ostrom 1992) These institutional resources were given a short-hand label of “social capital” and drew attention to the rich potential for integrating social and economic development (e.g., see Dasgupta and Stiglitz 2000). The work of Robert Chambers and the Participatory Learning and Action network that he and his associates inspired (Chambers 2007), provided an ethical orientation to work on institutional and social capital, which is an important precursor to the approach I am advocating now.

*Environmental Sustainability.* The emergence of concerns about the sustainability of water ecosystems has lagged behind the fashions of management and institutions, and has, as a result, been shaped by those ideas. The problems can be defined in terms of environmental outcomes, e.g., biodiversity loss, river morphology, water extraction and pollution (Brierley and Fryirs 2008), or socio-cultural outcomes such as forced resettlement, pollution-induced disease and loss of livelihoods (Johnston 1994). The underlying processes giving rise to these complex outcomes can be very usefully viewed in institutional terms. Rather than a tragedy of the commons, or of communities, environmental crises can be seen as tragedies of institutions. The good news has been that the deficient institutions can be reformed, or new ones can be crafted to better address social-ecological systems (Ostrom 2009).

While the reality of environmental degradation can be empirically measured, and contributing behaviors can be identified and observed, the contributing factors, the drivers of unsustainable behavior are not so easily known. Deforestation of a protected area, for example, may be caused by local communities who don't respect the boundaries established by the park managers. Is that because the park was established

without sufficient stakeholder consultation? Is it because the park guards are inadequately trained or motivated? Is it because the adjacent communities have no alternative source of fuel or income?

## A VALUES APPROACH TO WATER MANAGEMENT

Each of the approaches cited above: management, institutions, and environment, served to re-conceptualize complex, dynamic systems of common property and draw attention to aspects that previous models had underplayed. Each has been labeled a “paradigm shift” (at least by their proponents) to indicate that with this perspective, an irrigation system, an urban water utility, or a forested watershed, could work better and meet society’s needs more effectively. The various approaches represent perspectives that are mutually compatible. A management perspective looks at institutions and environment as part of the management field, but an environmental perspective gives primacy to environmental variables and looks to management strategies and institutional capacity-building as means towards those ends.

The advantages to employing multiple perspectives (e.g., management, institutions, environment) for the purpose of understanding a single kind of thing (e.g., an irrigation system) is similar to the advantages of travelling to other countries for the purpose of better understanding your own society. There is no “right” perspective, although some perspectives provide greater explanatory power and insights than others, for particular questions and in specific situations. A corollary to the “strength in diversity” principle of each perspective contributing to overall understanding is the caution that a single perspective should not be pushed too far. This “magic bullet” syndrome seems especially prevalent in the field of international development, where cultural blinders enable magic to seem very real indeed.<sup>2</sup>

Identifying “values and ethics” as a perspective on the same order as institutions or environment requires a sensitivity to the power of cultural variables that is typically lacking in the “magic bullet” worldviews of hard-line rationalists, and it is perhaps for this reason that ethics as a field of study related to water use is only now taking form (Selbourne 2000, Priscoli et al 2004, Llamas et al 2009, Brown and Schmidt 2010). The centers of ethical studies include academia (Philosophy and Religion departments), business (corporate social responsibility) and law (e.g., bio-ethics and conflicts of interest). Within the domain of ethics as a field of study, environmental perspectives (environmental ethics) constitute a relatively minor component.

Can a minor component (environment) of a narrow perspective (ethics) really have much significance to natural resources management, much less to common property studies? The very fact that environmental ethics remains an arcane topic is itself a function of the cultural values and ethical concepts of Western society and the dominance of so-called rational analysis. Yet there are glimmers of new life in the field of environmental ethics as related to natural resources. The experience of the changing

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<sup>2</sup> The infatuation with private sector market-based solutions to every ill, most recently micro-lending, and earlier programs of privatizing public services, provide fertile ground for analyzing the magic bullet syndrome.

climate, and the reluctant realization that our collective economic behavior is spoiling our own planetary nest, is engendering greater interest in understanding the core values underlying those unsustainable behaviors.

“Ethics” refers to two related but distinct concepts that are often confused. One meaning of the term is a *category of values* comprising a dimension of human experience, and serving as a driver of behavior. The particular set of cultural values that give rise to particular behaviors can be termed “an ethic” while the plural, “ethics” refers to the study of different ethical principles. The important feature of “ethics” in this sense is that it is descriptive (ethics exist) but not prescriptive about which ethic ought to be practiced. The other meaning of *ethics* and the adjective, *ethical*, has to do with a moral code guiding human behavior. In Sandra Postel’s concluding chapter in *Last Oasis* (Postel 1992:183-191) she cites the need for “A Water Ethic,” a point elaborated more recently by Armstrong (2009).

The confusion of these two meanings of ethics brings Postel and Armstrong to jump to the conclusion that we need a water ethic. If we take “ethics” in the more general meaning, as a set of values, then it is clear that we already have a water ethic. The problem then shifts to an examination of the water ethic that is dominant in our society. What we need is a different ethic, and once we identify this as the problem, we can look for ethical systems (i.e., sets of values) that are more consistent with the outcomes that we desire (e.g., sustainability). This issue is examined by Carolyn Merchant (2010, original 1997) who identifies three categories of ethics: *egocentric* (self-interest), *homocentric* (utilitarian social interest), and *ecocentric* (pure environmentalism). What we really need, she concludes, is a hybrid of homocentric and ecocentric ethics which she terms, *partnership* ethics, a “moral consideration for both humans and other species.”

## WORKING WITH ETHICS

Ethics, like institutions, management, or ecosystems, can be changed and, if the process is handled skillfully enough, improved (Feldman 1991, Groenfeldt 2010). We don’t have to accept the predominant cultural values any more than we must accept a corrupt and dysfunctional bureaucracy. With the right understanding, concepts, incentives and methodological approach, we can change, or at least influence the prevailing ethic to support new behaviors that we, the self-appointed change agents, deem to be preferable to the old behaviors.

Ethical values about social justice or rights of nature constitute incentives favoring particular behaviors. An ethical outcome (e.g., protecting the ecological health of a river) is the result of behaviors driven by particular values (the river has an intrinsic right to exist). The river’s ecological status might also be protected through economic instruments based on payments for ecosystem services, within the parameters of what Merchant terms “egocentric” or “homocentric” value systems. An environmentally acceptable outcome (a healthy river) can be brought about by different kinds of value systems (ethics), just as a child’s courtesy of serving tea to her grandmother might be

accomplished through an external threat or reward from the parents, or through internalized values about familial duty on the part of the child.

### *Step #1 Identify the Values*

Identifying the operative values underlying particular behaviors is the first logical step in the process of harmonizing values with desirable behavior outcomes. Until we identify the values underlying present behavior, our attempts to change behavior directly will be clumsy and inefficient, though not necessarily ineffective. Using tax incentives and fines to limit pollution does have an effect on real behavior, but targeting the values underlying the pollution might have greater effect. Values are always part of the decision-making dynamic, and warrant the same interest as any other variable in the pursuit of scientific understanding. Policy makers and water managers, who have been trained to think of their decisions as based exclusively on scientific principles, may be reluctant to reassess their actions as having a value dimension, based not only on data (about water demand and supply, rainfall predictions, etc), but also on values and tacit cultural and ethical assumptions about priorities and practices (Espelund 1998). Soderman's analysis of the ideology embedded in neoclassical economic theory offers an instructive lesson on the need for alternative approaches to establishing value (Soderbaum 2008). An implication of this concept is that the ideology inherent in according value to environmental services needs to be debated by society; to do otherwise is undemocratic, constituting the imposition of a particular and unsustainable ideology onto the whole society.

### *Step #2 – Analyze the Values*

Water laws and policies are expressions of economic, political, and cultural values and are a good starting point for trying to isolate values that are essentially cultural. For example, in the Western United States, the value of "economically beneficial use" is of central importance in water laws. Under this system, the environmental benefits of leaving water in the river is not recognized as "beneficial" unless it can also be shown to have an economic value. This materialistic emphasis often interferes with considerations of ecological function which do not have a defined market value. The inconsistencies between the values embedded in water laws and the values of society as a whole, or particular interest groups (e.g., environmentalists) or science (e.g., ecology, economics, hydrology) are indicators that the laws need to be re-examined or, conversely, that conflicting values among different social groups need to be debated and negotiated.

### *Step #3 - Evaluate Alternatives*

Values can be evaluated through comparative analysis or historical cases. Environmental historians document the evolving cultural values underlying resource management and may have valuable insights. For example, David Blackbourn's 2006 book on *The Conquest of Nature: Water, Landscape and the Making of Modern Germany* traces the evolution of engineering standards applied to the Rhine River, from

“command and control” strategies during the first half of the 20th century to more recent ecosystem-based strategies. The cultural assumptions (values) about the interaction of people and nature have shifted. Ecological principles offer a new paradigm of relating to Nature, which shares many features with indigenous animistic traditions which hold Nature as sacred. In a sense, ecology provides the scientific rationale for indigenous cultural values about rivers.

#### *Step #4 - Propose New Policies.*

Policy alternatives can be debated among stakeholders on the basis of desired values and outcomes. Governance issues and participatory mechanisms become critical for reaching solutions that are endorsed by the full range of stakeholders. By clarifying the values that the community (or country) wishes to promote, water policies can be formulated which reflect those desired qualities. [Flourney 2003]

#### CASE STUDY: SANTA FE RIVER WATERSHED, NEW MEXICO

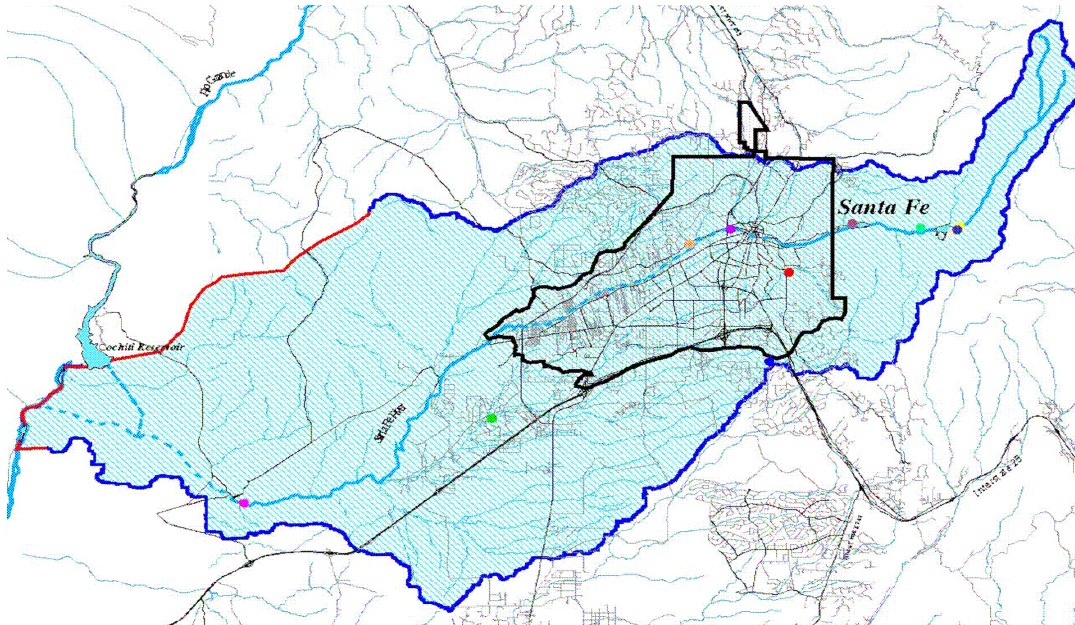
The Santa Fe River emerges from high (3,500m) mountains to the East of Santa Fe City and flows 75kms in a Westerly direction to join the Rio Grande. Two reservoirs in the mountains impound the entire flow of the river for City reservoirs, providing about half the water the city uses each year. The other half of the water comes from deep wells in and near the city, including from the Santa Fe River aquifer. Santa Fe’s water policies are based on 19<sup>th</sup> Century Western US water law and can be summarized in the phrase, “First in time, first in right.” Earlier claims to water trump later claims, other things being equal. The most important of these other things is putting the water to “beneficial use,” which means an economically productive purpose. Omitted from the law is any consideration of the water resource itself. Neither the rights of nature in general or the rights of a river in particular, are accorded a seat at the legal table.

#### *History of Water Use along the Santa Fe River*

The cultural history of the Santa Fe basin reveals a succession of cultures and corresponding values about the Santa Fe River. Indigenous Pueblo Indian tribes were already using the Santa Fe River for irrigation when the Spanish arrived in the late 1500s. With the establishment of Santa Fe as a provincial capitol in 1610, agricultural use of water intensified. The Santa Fe River provided water to a growing network of Spanish canals (*acequias*) which provided the food for the growing settlement. More than 30 acequias were established, irrigating roughly 800 hectares of farmland, and diverting so much water that stretches of the river were dry during the summer months.

Based on the cultural values underlying contemporary acequia agriculture (Rodriguez 2007), it seems safe to suggest that the colonial Spanish viewed the river primarily as a means of cultivating a secure food supply in this semi-arid environment. The rights of nature were implicitly assumed: “The tacit, underlying premise [of acequia irrigators] is that all living creatures have a right to water” (Rodriguez, p. 115). Another core belief

related to water was that it should be shared: “The principle of water sharing belongs to a larger moral economy that promotes cooperative economic behavior through inculcating the core value of respect and gendered norms of personal comportment” (Ibid, p. 116).



The 19<sup>th</sup> Century saw major changes in the cultural orientation towards the river. The United States annexed the territory of New Mexico in 1848. Thirty years later, the first dam was built on the river, to provide municipal water for the newly established Santa Fe Water Company. This event marks the introduction of a new ethic about water and rivers. For the first time in the river’s history, its water took on a monetary value, and ownership passed from communal to private. Initially, the Water Company stored less than 10% of the river’s flow for its customers, but by the mid 1900s, that proportion had increased to nearly 50%. From now on, the river’s water would be used primarily for continued urban expansion, rather than agricultural production.

The river today is operated with the objective of maximizing the water volume stored in the reservoirs, and minimizing water that is “spilled” into the otherwise dry river channel. Property rights to the river’s water were extracted from the Hispanic *acequia* farmers through legal maneuvers over many decades. In the 1990s, the city purchased the water company along with the accumulated water rights. The city’s rights comprise about 85% of the river’s average flow, which is highly variable. An additional 5% is owned by the heirs of the early farmers (now used for urban gardens) and the remaining 10% is unallocated, usually spilling from the reservoirs when the mountain snowpack melts in late Spring. The reservoir dams are operated by City engineers. Water is normally released from the dams in anticipation of Spring floods, and (in a recent policy evolution) for aesthetic purposes during the summer months. During the rest of the year, the river is a dry, heavily eroded ditch. The policy of keeping the river intentionally



dry earned it the designation as “America’s Most Endangered River” in 2007.<sup>3</sup> Partly in response to this negative publicity, the City government, which controls the reservoirs, shifted its policy to allow for summer water releases into the river provided the reservoirs are  $\frac{3}{4}$  full rather than completely full. A year-round minimum environmental flow, however, as required in other countries, is not under serious consideration. The City’s policy remains one of prioritizing storage at the expense of flow.

### *What’s a River For?*

Santa Fe’s municipal government has a permit from the State water office to utilize 5,040 acre feet (6.2m m<sup>3</sup>) of water annually from the river, equivalent to 80% of the river’s average, but highly variable, water yield. The permit, granted in 1926, specifies that the water is to be used for drinking water supply and “other municipal uses.” The interpretation by City’s lawyers, who have been well trained in New Mexico water law, is that “other municipal uses” includes irrigating parks, golf courses, and both public and private landscape irrigation, but does not include water for the river itself in the form of environmental flow. If a portion of the city’s water rights were to be deliberately left in the river to provide environmental benefits (i.e., a flowing river), this “use” of the water might violate the terms of the 1926 license, and in any case would subject the City to a challenge by municipal water users.

What about leaving water in the river as a means of aquifer recharge, and then pumping the groundwater to obtain the equivalent volume of permitted water? This approach, known technically as “aquifer storage and recovery” (ASR) would provide an environmental flow under the legal cover of storing the water in the aquifer. Here too, the water lawyers found legal obstacles. The water deliberately guided into the aquifer (through the natural mechanism of the flowing river) would need to be measured as it went into the aquifer, and physically traced in the aquifer, so that the water pumped out could be shown to be the same water that infiltrated in. In the absence of foolproof aquatic accounting, the ASR program could not be legally certified.

Peeling away the legal constraints we can expose a layer of ethics that is otherwise obscured. The willingness to accept the City’s legal entitlement as an adequate justification for dewatering the river implies consent with the principle of water as a commodity that can be freely owned and traded. The environmental ethic being expressed is that water is a resource that should be utilized for extractive purposes (golf courses) but not for environmental purposes (flow). A corollary to the “water-as-resource” principle is that the ecological context of the water (river, lake, aquifer) lies beyond the concern of resource management. In terms of environmental ethics, the municipal government of Santa Fe is complying with the ethical code underlying state water policies. While individual resource managers might privately prefer natural river flow to green golf courses, they are not willing to challenge the state water law. Similarly, the municipal government could instruct its water lawyers to seek an exemption to the terms of the 1926 water permit, but there would be the risk of unknown

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<sup>3</sup> The designation was made by American Rivers, a national environmental groups based in Washington, DC. For details, see: [http://www.americanrivers.org/assets/pdfs/mer-past-reports/mer-3\\_28\\_07c76c.pdf](http://www.americanrivers.org/assets/pdfs/mer-past-reports/mer-3_28_07c76c.pdf).



consequences should that request be rejected. Taking unilateral action to keep an environmental flow in the riverbed without legal authority from the state, would entail even higher risks that the released water would be hijacked by downstream users, or worse, the City's water permit could be jeopardized.

During the past several years of normal and above-normal precipitation, river flow has been maintained (through dam releases) for between 60 and 120 days each year. Water is released when the reservoirs approach capacity and would otherwise spill. Until recently, city water managers released extra water as quickly as could safely be released into the stream, but bowing to popular pressure, a new "living river" policy has been adopted: When water needs to be released due to reservoirs approaching capacity, the water is released slowly over a longer period of time. This new policy, while hardly creating an ecologically alive river, is a response to popular demand for a flowing river for aesthetic and recreational reasons.

What are the values being expressed by City officials who are unwilling to allocate any portion of their municipal water rights as environmental flow for the Santa Fe River, yet acknowledge through the "living river" policy that there are benefits in stretching the period of dam releases so the river can flow a bit longer? Clearly, the city officials place a high value on complying with state water law. Both the old policy of quick releases from the dam, and the new policy of slow releases to extend the period of flow, comply with state law. The more telling revelation about values, however, is in what is NOT done. By refraining from seeking a legal clarification from the state authorities aimed at allocating part of the quantum of the municipal water license for the purpose of environmental flow, the city authorities are reinforcing the default value that the river water is serving a "beneficial use" only when it is diverted out of the river. The logical corollary is that water remaining in the river brings no benefit.

The recent policy adjustment of extending the river flow, and giving this policy the misleading label of a "living river" policy indicates that there is some value placed on water in the river, but not as much value as for water stored behind the dam. City officials have adopted the language of environmentalism, but have redefined the terms to accommodate their existing behavior. In the words of the city's chief hydrologist:

"...a healthy Santa Fe River corridor (and eventually, hopefully, the entire urban watershed) provides significant ecosystem services. Vibrant riparian vegetation will armor the stream banks against the erosive power of large storm flows that can exceed base flow by a factor of 500, thus protecting property and reducing long-term maintenance needs. A healthy riparian ecosystem may also slow the urban flood pulse and increase streambed infiltration. The infiltrated streamflow, whether from storm or bypassed flows, helps recharge the local aquifer" (Borchert et al 2010).

What is missing from the vision of a healthy riparian ecosystem is any mention of water flowing in that ecosystem, or changes in behavior to reduce water demand, or meeting the demand through available technologies of water harvesting or greywater recycling.

Santa Fe's official pronouncements of a living river carefully avoids committing to the principle of maintaining a minimum "environmental flow," a principle considered absolutely fundamental to sustainable water management (Dyson et al 2003, Hirji and Davis 2009). Yet by endorsing an unspecified commitment to a "living river", city officials have so far been successful in countering environmental appeals for substantial reforms.

## **The Role of Institutions**

The institutional context of the Santa Fe River Watershed reveals a set of laws and government agencies that are common through the Western United States, where in the famous words of Mark Twain, "Whiskey is for drinking and water is for fighting". The cultural meaning of this humorous proverb is that water is viewed as private property, and the institutional, and indeed, ethical incentives call for acquiring as much of it as possible and, if necessary, fighting to acquire and maintain that property. The institutional infrastructure, which creates an enabling environment for expressing a "winner take all" water ethic, includes state water law, federal regulations, inter-state water sharing compacts, the New Mexico Office of the State Engineer (who has licensing authority over water use, but within the legal parameters of prior rights of appropriation and beneficial use), and the Santa Fe municipal water utility (overseen by the City Council and Mayor). Orbiting around the institutional power arrangements are educational support systems (e.g., the University of New Mexico Law Faculty which produces most of the state's water lawyers), business organizations eager for water that can support continued economic development, and nonprofit environmental organizations, including the Santa Fe Watershed Association<sup>4</sup> which has a mandate, but lacks authority, to protect the watershed ecosystem.

The water-specific institutions, e.g., the Office of the State Engineer (which is a dedicated water agency) but not the New Mexico Environment Department (which monitors and enforces water quality as one small part of its diverse functions) are committed to the protection of existing property rights and the regulation of new ones. Concern about the sustainability of the state's water ecosystems, such as the Santa Fe River, its aquifer and its watershed, stem not from an environmental mandate, but from a water delivery mandate. The only reason, institutionally speaking, for the State Engineer to protect the ecological health of the Santa Fe River would be if private water rights holders would be benefitted as a result.

Within the institutional worldview of the Santa Fe River, the fact that the river is dry most of the time is irrelevant. If anything, the dry river bed is an indication that the concerned water institutions are performing well. Unless it is a wet year and there is extra water that has no rights attached to it, a dry river bed means that the water allocated to its various owners had been duly diverted from the river and is on its way to providing a legally defined "beneficial use". The institutions that regulate and manage water are functioning according to plan. Moreover, the plan is generally reflective of, and supported by, the majority of local citizens. The evidence is indirect, but highly consistent, that the same unwillingness to commit to a permanent environmental flow

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<sup>4</sup> The author served as Executive Director of the Santa Fe Watershed Association from 2006 through 2009.

that is shown by city council members is also supported by many of their constituents. Statements made by the public at Council meetings, for example, generally endorse these positions.

The democratically-created institutions set up to allocate and manage water in the Santa Fe River are reinforcing policies which are unsustainable and inconsistent with scientific best practice, e.g., environmental flow. Not only are those institutions doing the wrong thing, in terms of sustainable water management, but they are so well integrated with mutually-enforcing incentives, that institutional reform appears impossible. Even the environmental community has adopted the position that the fundamental water principles of “prior appropriation” and “beneficial use” cannot be challenged in the short term, however harmful the environmental outcomes.

### **Values to the Rescue?**

Strong water institutions which become immune to environmental reforms, as I am suggesting to be the case in New Mexico, shift from offering a “solution” to water management to becoming a “problem” for sustainability. New Mexico’s water laws and public agencies have solved the problem of legal uncertainties surrounding water use, but that very success is driving the state’s water resources towards environmental disaster. The very success of the institutions in meeting their (limited) objectives, is interfering with the needs of adaptive management to address sustainability.

Faced with powerful water institutions working effectively to do the wrong thing, and successfully marginalizing alternative environmental voices, what can be done? This is the challenge confronting environmental groups around the globe, as they seek to overturn long-standing policies that are wreaking havoc on natural resources and traditional communities. In the case of the Santa Fe River, a values analysis would reveal discrepancies between the values expressed in water laws and policies on one hand, and the values held by many local citizens on the other. For example, a city-commissioned task force recommended in 1995 that river flow be maintained year-round, a sentiment echoed in a 2007 Town Hall Meeting. The vision articulated in 2007 included a restored riparian ecosystem with native fish and vegetation that is visually appealing and supportive of recreation and wildlife. The values underlying this vision are clearly incompatible with the policy of impounding the river flow in upstream reservoirs.

How can we move from acknowledging discrepancies in values to a constructive policy debate to harmonize those discrepancies? First we have to recognize the importance of the values that we care about, and how they conflict with the values embedded in a law or policy. “Unless we have a sufficient grasp both of our own values and of how a law or decision or action affects something we care about, we will not respond. The process of gaining clarity, of discussing the values at stake, may itself promote more reasoned thinking. Deliberation may promote ethical development” (Flournoy 2003:64).

While this process may sound tautological, it is not the only tool in the arsenal to reform cultural values about water and to promote a more sustainable water ethic. Other approaches include: (1) the application of science both directly (bring in experts) and indirectly through education, (2) new models and conceptual frameworks, such as Integral Theory (O'Brien and Hochachka 2010), (3) using visual and/or performance art to communicate through aesthetic and emotional channels (Irland 2007), (4) political action whether aggressive (e.g, Greenpeace) or diplomatic (e.g., WWF), and (5) governance arrangements that incorporate environmental and cultural stakeholders.

Of these approaches, the last, governance arrangements, may hold the greatest short-term promise in reforming unsustainable water ethics and resultant water policies. Thanks to the development of sophisticated institutional approaches to water management, governance is an acknowledged priority for policy makers and water managers. Principles of participation and stakeholder involvement are well understood (if not always followed) and the slogan of "Making Water Everybody's Business"<sup>5</sup> has been widely communicated. Significant progress could be achieved simply by implementing these concepts more vigorously so that a broader set of stakeholders is included in water decisions.

In New Mexico, water policies were developed by lawyers, entrepreneurs, and engineers. Although elected representatives have ultimate authority, in practice, they go along with the recommendations of the technical water managers. In cases where stakeholders are given official voice, as in a levee reconstruction project along the Rio Grande in central New Mexico, the role of "stakeholder" is defined on the basis of the existing water policies, with the interpretation that only a water rights holder has a "stake" in what happens to the river. This type of governance arrangement precludes environmental organizations (unless they happen to own water) and the vast majority of local residents.

A more generous interpretation of "making water everybody's business" would suggest expanding the concept of stakeholder to include interests beyond the economic shareholders to include Indigenous Peoples, environmental voices, and disciplinary perspectives from the arts, humanities and sciences, as well as from engineering and law. Values, after all, are held by people, both as individuals, and as cultural groups. For full representation of values, the people and groups holding those values need to be included as stakeholders.

Governance reform to expand the definition of stakeholders is only one part of the ethics puzzle, but it may be the keystone that enables complementary approaches (science, models, art, and policy) to take effect. Values do evolve; we can see this in the history of water development from raw conquest of nature to more peaceful co-existence. But values need to change faster than ever before to keep up with the climatic changes around us.

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<sup>5</sup> This was the subtitle of the World Water Vision presented to the Second World Water Forum in The Hague, March 2000.

## CONCLUSIONS

Values are everywhere, and if we make the effort to look for them, we can begin to utilize values as a tool for crafting sustainable water (and other) policies. The crisis of climate change adds an urgency to the task of “getting values right” but that crisis also provides experiential lessons about the difference that values can make. The many behavioral changes that could relieve pressure on natural ecosystems depend on changing values. Perhaps the new values that could make a real difference to the calculus of sustainability constitute true paradigm shifts of not just values here and there, but a whole system of values, or “ethics.”

The potential for behavioral change through changes in values and ethics presumes that values can be changed, and that we have some reasonable ideas of how to go about it. I have argued that the first and most important step is to acknowledge the existence of values hidden within water policies and practices, and only then can we apply creative approaches to transforming those values along the lines we feel would be desirable. The outcome is, in my view, much less important than the process of identifying, analyzing, and debating alternative values and their implied behaviors. It is critical to maintain a discourse around values and not only around behaviors, because behaviors need to be held accountable to the values they express.

When values are addressed and debated through an open and democratic process, there is little risk of the resultant behaviors being anything but sustainable. The danger comes not from democracy (in the ideal sense) but from ossified institutions which lose their resilience to respond to new situations, and then deny the value dimension of their own policies. Values as a concept and as a moral guide to practical behavior (ethics) serves to lubricate the otherwise sticky gears of institutions. What is commonly regarded as bureaucratic behavior can also be explained as the inevitable result of rules (institutions) excluding values in guiding behavior. We need institutions, but we also need values. The good news is that both are always present; we just need to look.

## REFERENCES

Armstrong, A. 2009. Viewpoint: Further ideas towards a water ethic. *Water Alternatives* 2(1): 138-147.

Blackbourn, D. 2006. *The conquest of nature: Water, landscape, and the making of modern Germany*. New York: Norton.

Brierley, G. and Fryirs, K. 2008. *River futures: An integrative scientific approach to river repair*. Washington, DC: Island Press.

Brown, P. and Schmidt, J. (eds.), 2010. *Water ethics: Fundamental readings for students and professionals*. Washington, DC: Island Press.

- Chambers, R., 1988. *Managing canal irrigation*. New Delhi: Oxford & IBH.
- Chambers, R., 2007. *From PRA to PLA and pluralism: Practice and theory*. Institute for Development Studies Working Paper 286.
- Coward, E.W. Jr., 1980. *Irrigation and agricultural development in Asia: Perspectives from the social sciences*. Ithaca: Cornell University Press.
- Dasgupta, P. and Serageldin I., 2000. *Social capital: A multifaceted perspective*. Washington, DC.: The World Bank.
- Dinar, A., 2000. *The political economy of water pricing reforms*. New York: Oxford University Press.
- Dyson, M.; Bergkamp, G. and Scanlon, J. (Eds). 2003. *Flow: The essentials of environmental flows*. Cambridge: International Union for Conservation of Nature (IUCN).
- Espelund, W. N., 1998. *The struggle for water: politics, rationality, and identity in the American Southwest*. University of Chicago Press, Chicago.
- Feldman, D., 1991. *Water resources management: in search of an environmental ethic*. John Hopkins University Press, Baltimore.
- Flournoy, A. 2003 *Building an environmental ethic from the ground up*. *Environmental Law and Policy Journal* 56:53-80.
- Groenfeldt, D., 2010. *The next nexus? Environmental ethics, water management, and climate change*. *Water Alternatives* 3(3): 575-586.
- Hirji, R. and Davis, R. 2009. *Environmental flows in water resources policies, plans, and projects: Findings and recommendations*. Washington, DC: The World Bank.
- Irland, B., 2007. *Water library*. Albuquerque: University of New Mexico Press.
- Johansson, R., 2000. *Pricing irrigation water: A literature survey*. World Bank Policy Research Paper 2449.
- Johnston, B.R., 1994. *Who pays the price? The sociocultural context of environmental crisis*. Washington, DC: Island Press.
- Korten, F. and Siy, R., 1988. *Transforming a bureaucracy: The experience of the Philippine national irrigation administration*. West Hartford: Kumarian Press.

Llamas, R., L. Martinez-Cortina, & A. Mukherji. (Eds.), 2009. *Water ethics: Marcelino Botin water forum 2007*. CRC Press: London.

Merchant, C., 2010. Fish first! The changing ethics of ecosystem management. In Brown and Schmidt (eds) 2010, pp 227-240.

O'Brien, K. and Hochachka, G., 2010. Integral adaptation to climate change. *Journal of Integral Theory and Practice*, 5(1), pp. 89–102.

Ostrom, E., 1992. *Crafting institutions for self-governing irrigation systems*. San Francisco: ICS Press.

Ostrom, E., 2009. A general framework for analyzing sustainability of social-ecological systems. *Science* 325: 419-422.

Ostrom, E., Schroeder, L., and Wynne, S., 1993. *Institutional incentives and sustainable development: Infrastructure policies in perspective*. Boulder: Westview Press.

Postel, S., 1992. *Last oasis: facing water scarcity*. W.W. Norton & Company, New York.

Postel, S. and Richter, B. 2003. *Rivers for life: Managing water for people and nature*. Washington, DC: Island Press.

Priscoli, J. D., Dooge, J., & Llamas, R., 2004. *Water and ethics: overview*. Paris, UNESCO.

Rodriguez, S. 2006. *Acequia: Water sharing, sanctity, and place*. Santa Fe: School for Advanced Research Press.

Selborne, [Lord], 2000. *The ethics of freshwater: a survey*. UNESCO, Paris.

Soderbaum, Peter 2008. From mainstream 'environmental economics' to 'sustainability economics'. On the need for new thinking. *Journal of Environmental Monitoring* 10, 1467–1475

Wickham, T., (ed.). 1985. *Irrigation management: Research from southeast Asia*. New York: Agricultural Development Council.