Water in the American West:

Finding Clarity through Clashing Perspectives

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One of the most prevalent issues in the American West, and indeed in most of the world today, is the limited and increasingly insufficient supply of freshwater for a growing body of human and non-human needs. In fact, MIT's *Mission 2012: Clean Water* project website cites the "lack of reliable water supplies," used for important processes such as agriculture, industry, and human consumption, as "one of the most serious crises facing us" today (MIT, 2012). The project's website goes on to explain that water in western North America, and particularly major sources such as the Colorado River, are threatened by "human overuse, environmental issues, and poor river management technique." While it would be nearly impossible to tackle the even the basic details of all western water issues in a single paper, a discussion of the various broad perspectives from which water use trends are defined as "problems" will ideally provide insight into the diverse and complex set of issues associated with this precious, life-sustaining resource.

The topic of water use in the American West extends into many spheres, each with its own conception of appropriate use and a consequent set of policy recommendations. Kenney (2003) argues that "most water issues in the region can be summarized by a single word: competition. Two types of competition are most salient: between the agricultural/rural and municipal/urban sectors, and between human/economic uses and environmental/non-market uses" (p. 9). Each sector is not only concerned with simply obtaining *enough* water, but also with ensuring "adequate supplies at desired levels of quality, cost and reliability" (p. 9). This paper will examine the issues associated with water use in the western U.S. through definitions put forth by the following major perspectives, as suggested by Kenney: traditional, municipal,

economic, and environmental. In essence, these definitions represent different and inherently simplified interpretations of issues surrounding western water. Although each perspective inherently privileges a specific management solution, when taken together they provide no single, easy answer to the spectrum of complexities associated with this important resource. Thus, evaluating each of these four perspectives and working toward a holistic definition that provides the most constructive and thorough view of the problem is a vital first step in devising appropriate policy and management solutions.

Traditional Uses: Agriculture, Ranching, and Mining

The allocation of water in the western U.S. has a complex legal history, much of which has stemmed from the rejection of riparian doctrine. The riparian doctrine, which was established in Tyler v. Wilkinson (1827) and still remains the basis for water allocation in many other areas such as the eastern U.S., declares that "every proprietor upon each bank of a river is entitled to the land, covered with water, to the middle thread of the stream" (cited in Hobbs, 1998, p. 28). Basically, this translates into the idea that the residents whose property abuts with a water source have primary rights to use that water, as long as reasonable consideration is given to ensure water for residents further downstream. Western water law makes a significant departure from this method of allocation in the appropriation doctrine, which relies primarily on the policies of "[b]eneficial use and preservation" (Hobbs, 1998, p. 2) and the cornerstone "first in time, first in right" (prior appropriation) rule during periods of drought (Matthews, 2003, p. 40). Under this complex legal doctrine, residents who perfect their water rights may move the water elsewhere through structures such as ditches and canals, even when they run through the property of streamside residents. This legislation allowed for the development of "traditional"

water uses in the West such as agriculture, ranching, and mining, which reap obvious benefits from the ability to move water away from its instream source.

Scholars such as David B. Schorr (2005) argue that principles stemming from historical miners' law and "contemporary radical, agrarian ideals of broadly distributed property and antimonopolism" truly underlie the formation of the West's water allocation system (p. 2) and have thus allowed these "traditional" industries to flourish. Thus, for traditional water users such as farmers, ranchers, and miners, water usage is a deeply rooted historical right tied to their livelihoods and culture. According to the USDA's Economic Research Service, many western states use up to ninety percent of their ground and surface water supplies in agricultural activities (2012). This highly consumptive use of water includes irrigating millions of acres of land to grow alfalfa and other crops for consumption by cattle. For example, "[i]rrigated pastures and hayfields consume more water than any other single crop in California" (Wurthner, 2002). Consequently, diverting large quantities of this increasingly scarce resource for other uses such as municipal services, recreation, or environmental protection presents a major problem for traditional users.

Unfortunately, this conception of water use advocated for by many traditional users has not adapted much over the years to include new concerns about both human and non-human environments. In essence, the definition is not context-sensitive. It fails to recognize that the "West has grown faster than the country as a whole for much of the last century, and is likely to outpace national growth for the foreseeable future" (Travis et al., 2005, p. 2). In fact, "despite the traditional image of the rural westerner, the distribution of the region's 63 million people is highly concentrated in cities—particularly in the 'Sunbelt' cities of the Southwest (e.g., Los Angeles, San Diego, Phoenix, Las Vegas)—making the West the most highly urbanized region

of the United States" (Kenney, 2003, p. 3). Travis et al. (2005) estimate that an additional 39.5 million people will move to the West by 2040, which is a 65% increase over the 2000 census statistics (p. 3). This "residential and commercial growth...spreading across the landscape," which includes both urbanization and "exurban" sprawling development, is significantly altering land use—and consequently water use—patterns (p. 2). Specifically, "development is carved predominantly out of lands used for agriculture," which is typically seen as a lower value land use by developers; thus "it also inevitably reflects a reduction of the agrarian and pastoral economy and culture that once formed the core of Western rural society" (p. 2). For these reasons, the definition of western water issues set forth by traditional users lacks context, largely disregarding the emerging trends in population growth and land use, and consequently failing to include the values of other resource users.

In the first chapter of *The Oxford Handbook of Contextual Political Analysis* appropriately titled "It Depends," authors Tilly and Goodin (2006) delve into the importance of always remembering the larger context of the issue at hand when making policy decisions. They argue that "[v]alid answers [to political questions] depend on the context in which the political processes under study occur" specifically "with regard to understandings built into questions, with regard to the evidence available for answering the questions, and with regard to the actual operation of the political processes" (p. 6). The recognition and incorporation of context in this sense, therefore, provides insight into why traditional users define the issue of water in the West in a specific way and may consequently exclude the designations promoted by other groups.

Inherent within this "traditional" definition of water use is a sense of blame directed at groups representing the "New West" community—defined by Winkler (2007) as "residents wearing Patagonia fleeces and western jeans, telecommuters, and professionals with laptops able

to work remotely...retirees seeking a lifestyle tied to the natural environment and the slower pace of country living,...[and] seasonal residents who divide their time between city and country"—for "causing" the issues associated with increasingly limited water supplies (p. 479). Most traditional users of water instead relate to the ideology of the "Old West" community, defined by images of "ranchers, horses, and dusty cattle drives." Based on this definition, "New West" residents are more likely to be concerned with services industries and recreation than with the historical industries that the West was built upon, such as mining, ranching, and agriculture. Thus, a large increase of New Westerners is likely to shift water and other natural resource use away from traditional uses and instead toward industries that fulfill more "modern" desires and applications, which could threaten the livelihoods of those whose occupations are deeply rooted in agriculture, ranching, and mining.

Finally, many traditional users fail to address environmental concerns brought forth by New Westerners and environmentalists alike. Kenney (2003) argues that the premise of prior appropriation that traditional users rely on "generally [does] not recognize any values in, or societal obligations to, the environment," and in fact, "it can actively encourage environmental impacts by creating incentives for rapid and complete development of water supplies" (p. 10). Also, because western water law requires that unused water be forfeited, "this policy also discourages parties from improving efficiency, as any water saved (or 'salvaged') is deducted from the original right" (p. 5). Thus, a water right holder may "waste" water in order to maintain a complete water right, causing shortages for other uses such as instream flows. However, if these use patterns continue, especially in the context of impeding changes in the climate, traditional users that have become dependent on accessing large quantities of water will not be able to obtain enough to meet their needs while simultaneously putting pressure on the supplies

of other sectors.

Overall, the perspective of traditional users fails to address changing social and political circumstances such as explosive population growth in the West and the various value shifts that come along with these changes. Consequently, it fails to accurately evaluate the facts underlying present and future water shortages. Although this perspective closely aligns with the legal governance structure of western water, it typically lacks a sustainable and cooperative management alternative for the future. While this view on water may be appropriate in specific places—such as those where there is significantly less competition with other resource users—it ultimately does not provide a solution to the imminent water issues of the modern American West.

Municipal Uses: More Water for More Residents

Many modern conceptions of water use in the West come from the realm of municipal water use. Perhaps this is due to the fact that many residents of the western U.S. know that they can turn on their tap at any moment and receive a consistent flow of potable water. However, physically delivering this water to residents involves complex layers of governance and management. For instance, Colorado's intricate system of municipal water suppliers includes Water Conservation Boards, Conservation Districts, and Conservancy Districts, among others, who each serve a different function in the process of attaining, managing, and distributing water. The municipal sector served by these processes is expanding quite rapidly. In fact, while municipal use only accounts for 15% of total Colorado River use (as compared to 70%, which goes to agriculture), "municipal deliveries are the fastest growing sector, driving demands for additional water supplies, placing pressure on a river system that is over-allocated and facing a

supply-demand imbalance, as well as the prospect of long term declines in run-off due to climate change" (Pacific Institute, 2011, p. iii).

The municipal sector must eventually face the reality of distributing an increasingly insufficient water supply to a rapidly expanding population living in a warmer, drier climate. However, many water organizations often feel that they have no other choice but to maintain the status quo in their operations in order to "ensure efficacy in organizational capacity and infrastructure" (Lach, 2005, p. 2053), especially within such a complex governance structure. Resorting to this method of "incremental and marginal innovation" has resulted in conservative water organizations that are resistant to change and lack the resiliency to deal with impending issues (p. 2027). In fact, a primary definition of success for a municipal water organization is "not being noticed" and having the ability to "stay well below the radar screens of the press and environmental groups" (Rayner, 2005, p. 211).

Overall, from the municipal perspective, consistently delivering water to customers is the top—and in some cases, only—priority. Thus, any restrictions on smoothly obtaining water to meet this goal are defined as major problems by this sector. However, this view of water use and management in the West proposes a problem definition that is also quite incomplete. By dealing with water limitations through "business as usual" approaches until catastrophe hits, the municipal sector disregards important values and uses supported in other definitions of the problem, such as those put forth by traditional users and environmentalists.

Just as the traditional users' approach largely ignores the trends in population and land-use change, the municipal perspective disregards the major historical water uses and the ideology behind them upon which the region was founded. In this case, municipal water organizations display their own self-interest: while determining how to best distribute an increasingly limited

water supply to a growing population is a difficult task, the continual urbanization of the West is a source of economic benefit to municipal water organizations. This conception of management resonates with many modern users: "most community leaders continue to see growth as success, and to view any decline of housing starts or jobs as somehow a 'failure,'" which requires that more water be consistently delivered to municipalities than ever before (Travis, 2005, p. 14).

In addition to disregarding traditional uses, this perspective often fails to adequately address the environmental aspects of managing entire ecosystems in the arid West with a limited supply of water. Because water is a non-renewable resource, the strategy of always being able to provide more water for more residents, especially when they live further away from the main water source or distribution center, inherently requires that other uses of water are limited. One potential consequence is the reduction of instream flows in rivers near development projects caused by increased diversions for municipal use. For instance, Denver Water and Colorado's Northern Water Conservancy District have recently proposed to increase the storage of Gross Reservoir, which would divert additional flows from the Fraser River, reducing it to almost twenty percent of its natural flow. A statement by the Colorado Division of Wildlife acknowledges that this proposed project will reduce instream flows, raise water temperatures, and potentially "reduce the ability of the river channel [to] maintain hydrologic function" and "trout and other aquatic wildlife" in the long term (Colorado Division of Wildlife, 2011). While this project would guarantee additional, more reliable water supplies for Colorado residents and is therefore strongly supported by municipal water organizations, it does so at the expense of maintaining the integrity—or at least the current state—of the natural environment.

Moreover, municipalities must comply with legislation enacted to deal with future issues of drought, which may come in the form of contingency plans. Because water organizations have

become increasingly rigid in their management, conforming to these contingency plans will present unexpected future challenges. For example, the U.S. Bureau of Reclamation (2007) "initiated a public process to develop interim operational guidelines that can be used...during drought and low reservoir conditions" for the Colorado River. These plans become increasingly complicated when coupled with the unpredictable effects, such as timing and severity of events, associated with climate change. In cases like these, strategies such as adaptive governance appear to be particularly useful. Adaptive governance promotes "the adaptation of policy decisions to experience on the ground as real people interact with each other and the soil, waters, plants and animals in specific contexts" (Brunner and Steelman, 2005, p. 19). In essence, this style of resource management endorses continual monitoring and adjusting of governance practices in order to best deal with uncertainties that may arise at any time, using both scientific and other types of knowledge. This strategy is particularly effective when dealing with complex realities "in which facts are uncertain, values in dispute, stakes high and decisions urgent" (Koetz, et al., 2010, p. 2).

In summation, the problem definition proposed from a municipal perspective lacks comprehensiveness: it focuses solely on water needed for human uses, which is only one facet of water use in the West. Because of this focus, the municipal perspective typically disregards values of most other interested parties, particularly those of traditional users and the environmental community. Moreover, the conception of always being able to provide more water to more people is unfeasible, as many places across the West are already struggling to meet current demand, much less finding ways to secure water for future needs under conditions of climate change and continual urbanization. Under the inflexible management strategies typical to this perspective, any unexpected water shortage will be a major challenge.

Economic Perspectives: Creating Efficiency through Water Markets

A recently released study by Protect the Flows (2011), an organization of over 500 businesses throughout the seven basin states that rely heavily on the use of the Colorado River, estimates that the Colorado River creates approximately $26 billion in economic output per year. Furthermore, according to the study, nearly a quarter million jobs are supported by the river. Protect the Flows (2011) claims, "if the Colorado River were a company... [it] would be the 19th largest employer in the Fortune 500." This data is just one example of how water is an important economic driver in the western U.S. for industries other than the traditional agriculture, ranching, and mining industries. Without the ability to control the storage, transport, and release of water, major economic activities such as hydroelectric generation and even recreation would not be possible.

According to Boland et al. (2009), "since World War II economics has received increasing weight in the planning for and management of water resources" (p. 1). Proponents of the economic perspective "argue for the treatment of water as an economic commodity, subject to largely unconstrained market exchanges driven by private decisions" (Kenney, 2003, p. 11). In his discussion of the benefits of the water market structure, Matthews (2003) argues, "water would move from agricultural uses to urban uses," therefore "reducing waste by improving efficiency" (p. 41). Moreover, according to the economic perspective, a market system promotes equitable transactions "between willing buyers and sellers" (p. 41), which could potentially encourage more conservative water use by new buyers because their commodity becomes increasingly expensive as competition for it grows. Thus, from this perspective, the problem of limited water supplies lies in inefficient use of water, which could be prevented by transitioning

toward a free "water market" system with a competitive pricing structure.

However, the economic perspective on the issue of western water directly conflicts with some of the major arguments and priorities presented by traditional users. For example, the "first in time, first in right" principle of allocation—although it does allow for some limited trading of water rights—clashes with the premise that water rights should be handed over to the highest bidder. In this view, reallocating water in a market structure essentially fails to recognize the cultural and historical value behind traditional uses of western water such as agriculture and ranching. In fact, the economic perspective often takes this one step further by circumscribing the causes of current water shortages to traditional users, accusing them of being "wasteful" because the water they use could be sold for more or used more efficiently in other sectors. For example, economists may mention the fact that in "most parts of the West, reallocating just 10 percent of agricultural water to municipal uses is generally sufficient to boost municipal supplies by 50 percent" (Kenney, 2003, p. 3). This clearly demonstrates the water-intensiveness, and to some extent the inefficiency, of agricultural use, but leaves out any mention of its cultural and historical significance.

Additionally, while selling water rights in a market structure may lead to increased efficiency in certain cases, it can drastically affect the economy of an agricultural area: "water exports [through the transfer of rights to other uses] can mean economic collapse for all businesses designed to support agricultural production, which in turn can undermine local tax revenues essential to support schools and other governmental services" (p. 10). Basically, many communities have become dependent on agricultural production in a variety of ways that are not directly part of the production process; therefore, transferring water from this traditional use could provoke many unexpected, non-linear results.

This market-based system may also diminish the amount of water set aside for environmental uses such as instream flows. For example, selling water to the highest bidder may encourage the buyer (an individual or organization) to use their highly-priced commodity wisely; on the other hand, wealthy organizations such as big oil and gas companies may be able to afford to buy large water rights and continue to use them as inefficiently, if not more so, than they had been used before in order to maintain their right to the water (as discussed in the critique of the traditional perspective). Either way, this market system necessitates intervention from the federal governmental or environmental groups who can protect or even purchase the rights to the water necessary to protect an array of environmental interests.

Finally, scholars such as Bonnie Colby (1990) suggest that the costs embedded within the operations of this market structure, known as "transaction costs," may be "inefficient and unnecessary impositions on the market" (p. 1184). While some transaction costs can be diminished through the use of continually advancing technology such as the Internet to find willing buyers and sellers and negotiate on prices, more "expensive" transaction costs in western water markets may include things like "ascertaining the characteristics of water commodities," and "obtaining legal approval for the proposed change in water use" (p. 1184). Therefore, while the creation of a water market may aid in replacing inefficient uses with more efficient ones through the transference of water rights, the market structure has some inherent issues that would be a challenge to successfully implementing it.

While the economic perspective is fairly accurate in its evaluation of where water could be used most efficiently, it largely disregards the values of traditional and environmental users. Moreover, the policy alternative of reallocating water to the most highly valued or efficient sources may cause certain industries and communities to collapse, rendering this definition non-

comprehensive, as it only focuses on specific parts of the problem such as reducing waste while others are left unsolved. Overall, some parts of this definition may provide appropriate ways to promote efficient use of a scarce resource, but other parts inappropriately discount the values of other resource users.

Environmental Perspectives: Quantity and Quality for All

Environmental conceptions of the issues associated with water in the West often arise from every living thing's need for water. A primary concern for many environmentalists that has been mentioned throughout this paper is that water is not always specifically allotted for non-human uses, such as for the maintenance of instream flows. Travis (2003) claims that stream flow is "the most obvious, and most focused on" resource need in efforts to protect biodiversity (p. 35). Various riparian habitats and the species that live within them, especially in the arid West, are constantly threatened by decreasing flows caused by warming temperatures and increasing withdrawals of water.

However, the priority of maintaining the appropriate quantities of water within streams, especially in the arid western U.S., often appears to conflict with development and other economic interests described above. This disagreement originates within western water law itself, where the "diversion requirement is based on the historic assumption that all legitimate 'beneficial uses' are off-stream," such as agriculture and industry (Kenney, 2003, p. 5). Some property-rights advocates, politicians, and analysts even go as far as to claim that legislation such as the Endangered Species Act has "thwarted development" (Travis, 2003, p. 32). Furthermore, "[e]ven if in-stream flows are protected, riparian habitats may not be" due to the increasing proximity of streams and other waterways to roads, railroads, and settlements (p. 37). This

argument can potentially make instream flow conservation seem like a "lose-lose" situation in cases where stream health or water quantity could possibly be reduced as a result of different external factors, providing other interests with a reason to argue against protecting instream flows in the first place.

A second concern from the environmental perspective is the quality of available water for both domestic and ecosystem use. While the Clean Water Act of 1972 created wastewater standards for industry and "water quality standards for all contaminants in surface waters" (U.S. EPA 2012), unregulated substances still diminish the quality of the limited western water supply for humans and ecosystems alike. One particularly important issue in the quality of western water is acid rock drainage, or "[a]cidic, metal-rich water draining from rocks high in sulfide minerals" (Todd et al, 2012, p. 1). When the acidification is exacerbated by abandoned mining sites or mining materials, it is specifically called acid mine drainage. Both the natural and human-induced causes of this problem result in a polluted water supply.

In addition, securing "quality" water supplies may mean very different things to different interest groups aside from being "clean." For example, while "agricultural water suppliers must deliver water that is not too saline for crops," those concerned about instream flows "must be certain that water is the right temperature for fish" (Rayner, 2005, 210). One particular case of water management in the Klamath River dealt with this point exactly: even though it was recommended that extra water be diverted from agricultural uses to instream flows in order to protect fish livelihood, the water (which would be released from shallow nearby reservoirs) could potentially exceed the lethal temperature for the fish in question (Brunner and Steelman, 2005). This case demonstrates the importance of considering the nuances in management contexts, even when the initial management suggestion appears to benefit the environment.

Another situation where the concept of guaranteeing a specific level of water quality has become extremely important concerns the Colorado River water that is delivered to Mexico. In 1944 in the Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande Treaty signed by the U.S. and Mexico, Mexico was allotted 1.5 maf of the Colorado River's flows, "slightly more than 10 percent of the river's average annual flow" (Pitt *et al*., 2000, p. 827-829). However, this water was often highly saline and quite polluted after it traveled all the way south and eventually across the border, especially due to the highly managed and engineered nature of the Colorado River with its various dams and reservoirs. The levels of salinity not only made the water undrinkable, but also had negative impacts on the delta ecosystem that was traditionally fed by much larger, unrestricted flows (p. 824). Thus, in 1973, the treaty mentioned above "was amended with Minute 242, which established salinity standards for water delivered" to Mexico (p. 834). Again, simply receiving an established quantity of water was not enough to meet the needs of all parties in this situation, so "quality" had to be defined in legal terms for this specific context.

However, solutions proposed by environmentalists to solve an array of water quality/quantity issues—such as the removal of various dams throughout the western U.S. to restore natural stream flows—could potentially be destructive to existing infrastructure and development according to some critics. Across the country, residents have become accustomed to building residential structures in floodplains that would be inundated if a nearby dam were removed. Moreover, infrastructure has become dependent on the current management system. For example, barges that transport agricultural and industrial projects in the Columbia River system need the deep waterways created by dams to navigate. These dams may also produce low-carbon, hydro-generated energy. Organizations such as Americas Rivers (2012) argue,

"removing these dams and updating existing energy and grain transportation systems presents an opportunity to improve the efficiency and reliability of these systems, as well as save taxpayer and electric ratepayer money." However, removing the dams and restoring natural flow would at first limit the efficiency of this distribution process and consequently reduce the economic benefits derived from it until the new system was fully integrated.

Finally, when intervening in these types of controversial issues, environmental groups may be perceived as elitist, particularly when they tend to rely strictly on science at the cost of disregarding the various values intertwined in a situation. Especially when considering issues of water management in the West, environmentalists are typically viewed as new comers or "New Westerners" (as described in the analysis of the traditional user view) who may not fully understand or value the history of the region. Perhaps most ironic is the dissonance that many environmentalists and New Westerners feel after "reinventing themselves" in the West: "Westerners watch these [land-use] changes and grieve over lost open space while simultaneously appreciating the benefits of economic and population growth, and the land development, expanded services, and property value appreciation that naturally follows" (Travis et al., 2005, p. 2). While many of those who value the environment move to the West for benefits such as open space, they also bring along—and to a certain degree expect the fulfillment of—their "New Western" values, which obviously conflict with the values of other groups in the region.

Overall, the environmental perspective may perhaps be the most accurate and reliable perspective with regard to scientific data about the increasingly limited supply of water and consciousness of a sustainable future. It is also fairly comprehensive in that it attempts to account of all parts of the problem, including human and non-human needs. However, it fails to

consider that other perspectives may value development and human satisfaction above all else and is therefore not typically convincing enough to become the dominant perspective on its own.

Conclusion

While none of these perspectives are completely comprehensive on their own, nor do they represent the values of all users and organizations within the general user group, each brings up a number of important priorities to consider when assessing the issues of water allocation and use in the American West. While the traditional perspective values the uses of water upon which the West was developed, the municipal perspective prioritizes the major resource needs of the highly urbanized "New West." The economic perspective taps into ideas about efficiency but often ignores the historical, cultural, and environmental importance of some "low-value" uses. Finally, the environmental perspective focuses on achieving proper quantities and qualities of water, which is highly context dependent and sometimes comes at the expense of limiting water use by some sectors.

One way to potentially begin integrating these four competing perspectives is to step outside traditional modes of governance. For instance, Kenney (2003) argues that major strides in the management of water issues in the West have been made through governance that breaches typical boundaries of scale: at the "federal level [there] have been passage and enforcement of environmental legislation;" "at the state level, incremental refinements to prior appropriation have brought a broadened definition of beneficial use" to include protection of uses such as instream flows; and at the local level, management has been scaled-down to the watershed level (12-14). This nested organizational structure can help internalize the externalities—the seemingly unrelated "outside costs" that may affect others—of water

management. Furthermore, Kenney (2003) claims that the most necessary reforms needed to deal with the complex water issues in the West are "those that discourage excessive use, promote conservation and efficiency, and that facilitate the reallocation of water from low-valued (mostly agricultural) to high-valued (mostly municipal) uses, all while remedying past environmental abuses" (p. 15).

Obviously, this is a high bar to meet. However, each of the four perspectives examined in this paper provides clues about how best to achieve cooperation while simultaneously promoting a sustainable supply of water to a region that is likely to become more urbanized as it becomes more arid. By coupling the historical and cultural factors innate to traditional water uses with the more recent concerns about population growth, economic efficiency, and environmental resilience made salient through the other perspectives, a collaborative and adaptive plan for future management of western water resources is possible.

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