

Governing New Mexico's Water: Lessons from the Commons

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"[T]here is no such thing as a common-pool resource. Scarcity is the central issue.... Given ubiquitous scarcity ... a resource ... may exhibit socially pertinent "subtractability" and high exclusion costs, but these ... are a property of the institutional arrangements associated with that resource.... Physical objects (water, trees, fish, cyberspace, highways) cannot possibly have socially and economically pertinent traits apart from the institutional structure that defines individuals with respect to each other [and] to the physical object under consideration. When one focuses on property one focuses on the socially constructed norms, rules, and entitlement regimes that are the proper purview of the behavioral sciences." —DANIEL BROMLEY¹

Abstract

New Mexico's diverse Native American and Hispano *acequia* traditions both inform and complicate the process of crafting institutions for governing the water resources of the state. Before the 20th century, both these cultures (to oversimplify a complex reality) treated their water sources and supplies as commons, governed them at the community level, and made collective decisions about access, uses, and responsibilities of individual users. Near the beginning of the 20th century, the power to decide who had access to a source of water moved to the State Engineer, while determining how water would be used became the province of the individual water right holder, "hollowing out" the authority of the community to make collective decisions.

In the 21st century, as population pressures collide with physical constraints and management regimes that often fail to protect the rights of senior appropriators, officials are trying to balance conflicting values while introducing greater flexibility and efficiency into procedures to move water from historical to new uses. Water planning processes with strong public participation have raised awareness of issues of institutional design concerning "active water resource management" – how much "market" and how much "regulation"?

Both collective and autonomous market choices have roles in institutional arrangements that reflect the multiple values of New Mexicans, but in a situation of growing scarcity, collective choices will predominate. Protecting and strengthening mechanisms for collective choice, particularly at the local level, responds to people's core values, while appropriately structured and regulated markets may allow willing buyers and sellers to transact productive agreements. Negotiation has an important place in a framework for market regulation that accounts for negative externalities of proposed transfers.

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¹ "Let's Focus on the Performance of Alternative Institutional Arrangements." *Common Property Resource Digest*, 67 (April 2004): 4.

Introduction

The common property regimes of the ancestors of Native Americans and colonial Hispanos are remembered and honored by their descendants in scores of New Mexico communities today. Thus, despite the institutional dominance of Anglo-American “Western water law” in the state, New Mexicans may have better options than people elsewhere (at least in the United States) to construct alternative institutional arrangements for governing their water resources. For some it is an article of faith that reviving these older arrangements will produce outcomes that will be environmentally sustainable, culturally and socially just in the present and future, and economically productive.² However, some trends in state policymaking move in the opposite direction, treating water rights as private property and as a marketable commodity.

Naturally occurring water has often been thought of as a “common-pool resource” belonging to all or to no one (a concept analyzed below in this article). However, over the centuries individuals have appropriated water and developed infrastructure and systems to divert and deliver it for various uses. Water clearly has economic value. It gives value to land by making it possible to live and to sustain life in arid climates. In the words of the New Mexico *dicho*: *Sin agua, la tierra no vale nada*. Because of its scarcity, rights to take and use water are in increasing demand as population grows and the values of alternative uses are understood.

Throughout history, changing values and concepts of property have shaped rules for allocating water in New Mexico. People differ in their understanding of who has rights to property, and specifically property rights in water. Cultures throughout the world have historically held a variety of beliefs about water as a “good,” or a thing of value, and about how or whether it can be “owned,” or be someone’s property. These beliefs about the nature of water both shape and are shaped by the institutions (rules and norms) that govern its “ownership,” distribution, management and use.

Historical Understandings of Water's Value in New Mexico

Pre-Hispanic Native American Property Concepts

In what is now New Mexico, before the arrival of the Spanish conquistadors and later waves of settlers, Native American communities lacking explosives and iron-based technologies had developed ingenious methods for harvesting, impounding and delivering water to crops in local situations.³ However, they had limited capabilities to divert major quantities or for large

² See, for instance, José A. Rivera. 1998. *Acequia Culture: Water, Land, and Community in the Southwest*. Albuquerque: University of New Mexico Press.

³ Kurt Anschuetz. 1995. Two sides of a coin: Early Pueblo Indian Farming Practices in the Río Arriba and Río Abajo of the Northern Río Grande. [Conference paper, Minneapolis.] Society of American Archeology. 2, 5-8, 11.

scale capture and storage. Nor did they have means to deny its use to others by appropriating enough to deplete downstream supplies. Water was a gift of nature essential for life itself, but it was undependable, to be used sparingly, and by its nature to be shared.

Although it is tempting to suggest that pre-European native America was somehow a Garden of Eden where harmony with nature endured, the reality of people's relationships to the land and water was more complex. Native property concepts and institutions were adapted to their economic and technological circumstances. For instance, in the Rio Grande valley, the archeological record and early Spanish explorers' reports show that Pueblo communities had built thriving subsistence economies by early in the 16th century. Drawing on archeological evidence, David Stuart concludes that an "extensive" strategy of diversification was a key to their success. Seed selection resulted in dozens of varieties of corn, beans, melons and squashes, planted in different microenvironments using different techniques. The successful pueblos "pursued complex combinations of dry farming and irrigation," but also "clung to adjacent uplands, both to farm and to hunt." Additionally, handicrafts – cotton goods, pottery, jewelry – flourished as trade networks focused on river valley corridors were re-created after the collapse of the Chaco empire. Stuart points out that "social and economic mechanisms internal to each pueblo move[d] a share of the harvest between those who had been fortunate in a given year and those who had not. In most...pueblos it is the act of actually farming an awarded plot for a year that gains someone the right both to continue using the land and to share in others' harvests."⁴

These institutions and strategies (including ritual life and labor organization) were designed to assure "permanence" – the ability of Pueblo communities to endure in an uncertain environment. These strategies relied not on power but on both individual and collective responsibility. Spanish explorers spoke of these settled communities as "peaceful" and "generous." Permanence was not guaranteed; crop failures, raiding, and both intended and unintended consequences of Spanish colonization took a great toll, causing famine, death and the desertion of whole communities.

Colonial Hispanic understanding of property (land and water)

The word "acequia" comes from an Arabic word meaning "to irrigate." North African Berbers and Arabs from Egypt, Yemen and Syria occupied southern Iberia for over seven hundred years. When Conquistador King James I encountered these Islamic irrigation works in the kingdom of Valencia, he prohibited anyone to disturb these systems. In granting land use privileges to the returning Spanish colonists, he authorized taking river water for irrigation

⁴ David Stuart. 2000. *Anasazi America: Seventeen Centuries on the Road from Center Place*. Albuquerque: University of New Mexico Press. 162-164.

purposes “...según que antiguamente era y fue establecido y acostumbrado en tiempo de sarracenos” (as established and customary in the time of the Muslims). A decree in 1238 granted the settlers use of the Valencia acequias: “*Damos y concedemos perpetuamente todas y cada una de las acequias de Valencia ... de modo que podais regar a la manera que de antiguo es costumbre....*” (We grant and concede in perpetuity each and all of the acequias of Valencia ... so that you might irrigate in accordance with ancient custom.)⁵

When Spanish conquistadores set out to occupy and develop the northern frontiers of Nueva España, they were guided by policies known as the *Leyes de los Reynos de las Indias* and the accompanying *Ordenanzas de Descubrimiento, Nueva Población de las Indias dadas por Felipe II en 1593*. Recompiled in 1681, these provided the framework colonists and provincial governors used in planning permanent settlements, though the *ordenanzas* were implemented loosely in response to local conditions and resources available in the immediate surroundings. Spanish policies for occupation and settlement in New Mexico were followed by successive waves of colonists arriving from Zacatecas, Mexico City and elsewhere in Mexico's central valley. The first Spanish-Mexican communities were established on the Río del Norte or its tributaries north and south of Santa Fe from Taos to Socorro.

Constructing the acequia irrigation works was a principal factor in making colonization possible.⁶ In many places, acequias were built in tandem with or even before the local mission, church or presidio. On larger streams, the settlers built wing dams protruding into the river from one of the banks to channel water into the acequias during the irrigation season when natural flows were highest. On intermittent streams they constructed dams (*presas*) from locally available materials across their width to create small reservoirs. Then they excavated the main canal (acequia madre) off one or both banks. Typically, the *acequia madre* was cut perpendicular to the stream source at the upper end of the community and then conveyed water downstream, parallel to the river following the natural slope of the terrain for several miles, enclosing the practical limits of irrigable land. Finally, water was returned to the original stream through a *desagüe* (drainage) channel.⁷

The commons ditch established a distinct place, defining the boundaries of the community, and bonding the irrigators by obligating them to the collective management of the local water system and their corporate village as a whole. The idea of a common property ditch

⁵ Margarita Box Amarós. 1992. El Regadío Medieval en España: Epoca Árabe y Conquista Cristiana. In *Hitos Históricos de los Regadíos Españoles*. Madrid: Ministerio de Agricultura, Pesca y Alimentación. 77.

⁶ Michael Meyer. 1984. *Water in the Hispanic Southwest: A Social and Legal History*. Tucson: Univ. of Arizona Press. 77.

⁷ Rivera (*supra* note 2). 2-5.

for all irrigators in any new settlement was replicated time and again and was the key to the development and economic survival of local communities. The structure and form of the community acequias as self-governing corporate bodies have adapted to local conditions, as have their customs, traditions and local practices. Most importantly, the acequias were, and remain, communal. "Their construction, maintenance, and magnitude of operations were beyond the capabilities of individual cultivators and irrigators. Ownership in common and the shared responsibilities for the cyclical labor [were] essential to the economic welfare of the entire community."⁸

The annual ritual of cleaning the acequia (*limpia*) at the start of the irrigation season was and remains still an important event. At this time, the officers and irrigators may discuss a range of issues—the condition of the *presa*, any repairs that might be needed, the amount of expected water flows based on the winter snowpack in the sierra, ditch finances, and other items of importance to the irrigators or to the community as a whole. Thus, the *limpia* is also an occasion for the *vecinos* to address other local issues, reconfirming the sense of traditions that undergird the social and political life of the community. In this rite, the *parciantes* renew their attachment to "place."⁹ The *acequias de común* wed their members to a common future and livelihood expressed in the phrase, "Water is the lifeblood of the community."

Pueblos and Hispanos: a rocky road to mutual understanding

The Spanish conquistadors and missionaries who established the first European settlements in *El Reino del Nuevo México* chose deliberately to locate their first communities adjacent to Pueblos both because of available water and farmable land, and "because the native populations clustered there offered bodies to be worked and souls to be saved."¹⁰ Although they carried with them, as we have seen above, strong traditions about the commonality of water, their core values about the relationship of human beings to nature and natural resources were quite different from those of the Pueblo Indians among whom they settled. Moreover, they had the technology to act on their viewpoint. They had come to the New World not to adapt to its exigencies but to change it. Meyer writes: "... Indians were instructed by example... [that m]an was not a part of nature but was somehow set apart from it to use it... Water was suddenly a source of private wealth, of capital, of rent, of income, and most importantly, of human power over one's fellow man."¹¹

⁸ *Ibid.* 52.

⁹ *Ibid.* 98, 147-8.

¹⁰ Meyer (*supra* note 6). 8.

¹¹ *Ibid.* 21.

When Juan de Oñate, conquistador and first governor of Nuevo México, arrived at the confluence of the Chama with the Río del Norte (Río Grande), the Tewa-speaking Pueblo Indians, who had been successfully farming the valley land when the settlers arrived, apparently did not object. Perhaps the Spanish presence seemed small enough not to constitute a serious threat, while the possibility of acquiring the European innovations – metal tools and weapons, horses, sheep (and therefore wool), cattle, and new crops such as wheat and fruit trees – may have appeared a reasonable tradeoff for sharing the land and water with only 200 colonists. At this point, the idea of competing for water may have been unthinkable. Indian pueblo populations in the upper Río Grande Valley were sizeable,¹² and their farming was done on a commensurate scale, but adequate water was available at first for additional diversions.

During the next eighty years, however, the situation for the Pueblos grew drastically worse, leading to the Revolt of 1680. Religious intolerance, the feudal *encomienda* system, and with them a drastic decline in Pueblo population, reached a point beyond which the Pueblos would not be pushed. The Revolt forced the Spanish provincial authorities to re-evaluate and reconstitute the basis for the social order they were trying to establish in Nuevo México. By 1697, in the process of the “peaceful reconquest,” Spanish policy changed from extraction of wealth and tribute to occupation and settlement of land.¹³ The Pueblos in turn accommodated themselves to building a new economy based on intensive, irrigated agriculture. Henceforth they would have to struggle to hold their own as Spanish governors, after the Reconquest, began to award land grants to new groups of settlers recruited from Mexico.

Although there had been some intermarriage between Pueblo Indians and Spanish employees of *encomenderos* during the pre-Revolt period, a good deal more *mestizaje* began to take place as community land grants were made adjacent to Pueblo lands. Mutual acculturation was not dependent on intermarriage, however. Other shared activities were equally important. According to Spicer, “There was much cultural borrowing in craft techniques, food preparation, agriculture, language, curing, [etc.]... under conditions of equality. Here there was probably as much influence from the Indians on Spaniards as the reverse.”¹⁴

¹² Albert H. Schroeder. 1968. Shifting for Survival in the Spanish Southwest. *New Mexico Historical Review* 43. 4. Schroeder estimated 80-92 Pueblo settlements along the Río Grande with a total population of between 20,000 and 100,000 at the time of Oñate's *entrada* in 1598. Spanish colonial sources put the number at 30 to 80 thousand in 150 communities. The extent and causes of the Pueblo population collapse that occurred in the centuries following contact are still not well understood.

¹³ Frank E. Wozniak. 1998. *Irrigation in the Rio Grande Valley, New Mexico: A Study and Annotated Bibliography of the Development of Irrigation Systems*. Ft. Collins, CO: Rocky Mountain Research Station [US Forest Service]. 19.

¹⁴ E. Spicer ed. 1962. *Cycles of conquest: the impact of Spain, Mexico, and the United States on the Indians of the Southwest, 1533-1960*. Tucson: University of Arizona Press. 302.

Jemez Pueblo historian Joe Sando puts it even more strongly. “There developed a culture known as the Pueblo-Hispanic culture, and the Spaniards were insidiously, slowly, and inevitably brought to embrace Pueblo ways, including the subsistence pattern of agriculture.”¹⁵ The feudal *encomienda* system had ended with the Revolt, and in some ways it appeared that the Pueblo peoples and Hispanos had been placed on an equal legal footing. But in both absolute and relative terms, the Pueblos continued to lose ground.

The process of giving grants (*mercedes*) of lands to individuals and groups of settlers initiated after the Reconquest continued throughout the 18th century. According to the formal rules established by the crown and well known in Nuevo México, the *Recopilación de Leyes de Reynos de las Indias* of 1681, Indian lands were to be protected from encroachment, particularly lands that they were farming and irrigating. Throughout the 18th century, when Pueblos complained about encroachments or theft of land or water, results depended on the predisposition of the sitting Spanish governor regarding Indian property rights, the effectiveness of the Indians’ counsel (*protector de Indios*, provided by law), and the Pueblos’ own strategic behavior.¹⁶ One quasi-judicial method for resolving water disputes over distribution water from a single source was the *repartimiento de aguas*. Based on principles contained in the *Recopilación* to assure fair treatment of Indians, the process sought a “fair division of what was available [in a manner] ‘such as to offend no one’.”¹⁷

Anglo-American concepts of property rights to water

During the American “Territorial” period from 1848 up until it became the 47th state admitted to the union in 1912, New Mexico experienced a quiet revolution in terms of both the constitutional basis and the operating rules for governing and managing its water. The Indian Pueblos and Hispano acequia communities that had controlled the water locally and had developed among themselves institutions for its equitable allocation ceased to be the only appropriators of surface water from the Rio Grande and its tributaries. These widely scattered irrigation communities had worked out systems of rules, grounded in custom and tradition and in practical knowledge of the local landscapes, that had for at least a century and a half enabled

¹⁵ Joe S. Sando. 1992. *Pueblo Nations: Eight Centuries of Pueblo Indian History*. Santa Fe: Clear Light. 44.

¹⁶ Malcolm Ebright, (1996). *Advocates for the Oppressed : Indians, Genísaros and their Spanish Advocates in New Mexico, 1700-1786*. *New Mexico Historical Review*, 71. 4. The Pueblos themselves were sometimes in the market to repurchase or regain lands they had lost. Ebright writes: “By 1749, Governor Vélez de Gauchupín and his bureaucracy of local officials began to show more concern for protecting pueblo land and water. Procedures for... appraising and accounting for land sold to the pueblos by Spaniards were refined and expanded.... The Indians became adept at preserving evidence and biding their time before bringing a lawsuit until a favorable result could be reasonably expected. They realized that landmarks were likely to be moved, so they sometimes placed a hidden landmark underground so that a boundary could be relocated even if the above-ground marker was moved.” 332.

¹⁷ Meyer (*supra* note 6). 135.

them to survive, balancing use with supply, and sharing shortages in times of drought. The rules had been designed for a subsistence way of life. They required appropriators to monitor each other's behavior, and to sanction those who took more than their share or failed in their responsibilities to the collective that was the source of their limited rights to the resource they termed the "lifeblood of the community."

"Anglo" newcomers arriving in the last half of the 19th century challenged these traditional arrangements. They viewed the ecological adaptations to arid lands on which these institutions were based as primitive. They embodied an ethic based on America's "manifest destiny," fueled by the belief that they could and, by right, should bend nature to human will.¹⁸ They promoted ambitious ideas about what could be accomplished by irrigation agriculture in New Mexico's Rio Grande and Pecos river valleys. After 1879 they arrived by railroad, and in the thirty-year period between 1880 and 1910 the state's population jumped by over 170%.¹⁹

To these entrepreneurs, local control of the state's water by small-scale irrigators meant waste and inefficiency. The acequia system was too entrenched for the territorial legislature to replace it directly. Instead, legislators created new mechanisms – water companies, irrigation districts, and later conservancy districts – through which control of major tracts of land and, more importantly, of the water rights appurtenant to them, moved from community control into private hands, while authority to allocate such rights was centralized in the office of the Territorial (now State) Engineer. Passage of the Reclamation Act by Congress in 1902 ushering in the "water development" period aided and abetted these trends.

As inadequate as the American government has been in respecting the property guarantees of the Treaty of Guadalupe Hidalgo for both Hispanos and Indians, early on it did recognize the acequias' importance. In 1851, the legislative assembly acknowledged the legitimacy of customary and traditional acequia rules in the first water laws of the territory. Successive territorial assemblies both expanded acequia authorities and limited their autonomy. By the end of the 19th century, acequias had been designated quasi-public corporate entities. But their real power rested in their control of access to water. They could decide whether water was "unappropriated" and available to be put to new use. They assigned preference to different uses in times of shortage. They gave the community access to water not as a property right but in exchange for members' acceptance of the political rights and responsibilities of participating in

¹⁸ For a discussion of utilitarian views of the environment in American social thought, see generally Jeanne Nieranber Clark and Hanna J. Cortner. 2002. *The State and Nature: Voices Heard, Voices Unheard in America's Environmental Dialogue*. Upper Saddle River, NJ: Pearson Education, Inc. [Div. of Prentice-Hall].

¹⁹ John O. Baxter 1997. *Dividing New Mexico's waters, 1700—1912*. Albuquerque: Univ. of New Mexico Press. 81.

ditch governance.²⁰ Enactment of New Mexico's water code in 1907 and a series of decisions over the next decade in state courts resulted in the loss of these community acequia powers.

The power to decide who would have access to a common source of water was... sent up to a state bureaucrat, the New Mexico State Engineer.... [T]he power to rank uses was sent down to individual irrigators. So long as the use was "beneficial" (and almost all uses were), then the choice [was better left to individuals]. Finally, water rights became property rights – the expression of individual ownership – and not the corporate political will of a community ditch association.²¹

Twentieth century "Anglo" values were embodied in Steve Reynolds, New Mexico's State Engineer from 1955 until his death in 1990. Reynolds' philosophy, as Hall notes,

... was based on an instrumental view of nature in general and water in particular. Natural processes were good ... only by virtue of what they could do for man. Water that was left in a stream helped no one and water that was left in the ground remained hidden. [He] fought the increasingly popular notion that water in rivers—"instream flows"—deserved legal protection because he believed so fundamentally that the operative term in "beneficial use" was "use."²²

To a great extent, patterns of water allocation and use throughout New Mexico are governed by these recent, superimposed, institutional arrangements and by the values they reflect. Yet among acequia communities and the Pueblos in el Norte, the old institutions and values persist, and the new arrangements are still adapting to them.

Values and property concepts shape water management institutions

Many "stakeholders"; many values

How a society allocates water is shaped in large part by its institutions, including its distribution of property rights. This is why we have described the evolution of water institutions in New Mexico in some detail. But underlying institutional arrangements are deeply held values, including cultural beliefs, including beliefs about nature, the relationship of human beings to each other, and the place of human beings in the world.

Our central concern in this section is to consider how (on what basis) people choose to use a scarce and unpredictable supply of water. First we consider the multiple values people hold about water. Following this, we take up how concepts of property rights affect how these values are translated into decisions about allocation and use.

²⁰ G. Emlen Hall. 2000. Tularosa and the Dismantling of New Mexico Community Ditches. *New Mexico Historical Review* 75:1. 78-9.

²¹ *Ibid.* 79.

²² G. Emlen Hall. 2002. *High and Dry: the Texas-New Mexico struggle for the Pecos River*. Albuquerque, University of New Mexico Press. 118.

When it comes to water, everyone is a “stakeholder.” Individuals have many different “stakes” in water, and multiple value perspectives. As an example, significant differences in value orientations might be expected between residents of New Mexico who live in rural and urban environments. (One may rely on a domestic well for water; while another pays a city utility bill. One may irrigate a few apple trees and pasture grass from a Middle Rio Grande Conservancy District irrigation ditch; another may water a few flower pots with tap water.) Attitudes about water are shaped to a great extent by people’s experiences, including their understandings about its scarcity.

Farmers’ values might be expected to favor economic uses, in particular agricultural production; “non-farmers” – particularly urban residents seeking connections with nature – might on the other hand be thought to have stronger orientations toward environmental and esthetic values. The tension between the two is embodied in the ways popular media define the allocation problem when water is short: for instance, as a struggle between “fish and people.” But this greatly oversimplifies and distorts the range of values that people bring to bear in assigning importance to different water uses.

Research into public opinion shows this clearly. In the spring of 2000, the UNM Institute for Public Policy (IPP) conducted a telephone survey of the attitudes and preferences about water of residents of the Middle Rio Grande (MRG) region and of the state generally.²³ Overall, New Mexicans assigned high value to green landscapes along New Mexico’s rivers and streams, even though half the respondents to the survey said they had spent no time within the past year “along any of the rivers or streams in New Mexico.” Table 1 shows that both MRG and “Rest of State” residents placed high value on both the “natural” landscape (i.e., the bosque and riparian habitat) and irrigated farmland (all within the top tier of valued uses).

²³ J. R. Brown *et al.* 2000. Attitudes and Preferences of Residents of the Middle Rio Grande Water Planning Region Regarding Water Issues. Albuquerque: Univ. of New Mexico Institute for Public Policy.

		MRG	Rest of state
# 76. Indoor use in existing homes	Mean	8.17	8.32
	Median	9	9
# 84. Preserving the native cottonwood forest and vegetation along river banks known as the bosque, that creates habitat for a variety of different animal species	Mean	7.69	7.50
	Median	8	8
# 72. Irrigation for farms	Mean	7.59	7.99
	Median	8	8
# 82. Providing food and refuge for fish, birds and other animals	Mean	7.54	7.56
	Median	8	8
# 78. Indoor use in new housing developments	Mean	6.62	6.94
	Median	7	7
# 83. Cultural and religious uses in some villages and pueblos	Mean	6.38	6.34
	Median	7	6
# 74. Recreation, such as fishing and rafting	Mean	6.14	6.40
	Median	6	6
# 81. Community parks and sports fields	Mean	5.66	5.52
	Median	5	5
# 75. New industrial uses, such as manufacturing processes	Mean	5.29	5.41
	Median	5	5
# 77. Watering existing yards and landscaping	Mean	4.40	4.57
	Median	5	5
# 79. Use for yards and landscaping in new developments	Mean	3.82	4.14
	Median	4	4
# 73. Watering golf courses	Mean	3.18	2.93
	Median	3	2
# 80. Swimming pools for individual homes	Mean	2.68	2.58
	Median	2	2

Table 1: Values respondents assigned to various uses of water [Scale: 0 (don't care whether water is available for that use) to 10 (want to be sure that water is available for that use)].²⁴

The survey also asked respondents "...how important you think it is to keep water in New Mexico's rivers and streams in dry years." The MRG and "rest of state" (ROS) samples were divided into households that farm irrigated land and those that do not. Analysis of the data shows that among the MRG sample, both groups assigned about the same importance to instream flow. However, in the ROS sample, while irrigators assigned instream flow an importance well above the midpoint on the scale, respondents who do not grow crops gave instream use a statistically significant greater importance. This is shown in Table 2 on the following page.

²⁴ Source: Brown (*supra* note 23). 11.

Using a scale from zero to ten where zero means not at all important and ten means extremely important, how important do you think it is to keep more water in the river in New Mexico's rivers and streams in dry years?		Irrigators that grow crops (for personal consumption, sale or both)	Non-farmers (remainder of sample)	Mean difference	p-value
	MRG	7.70	7.59	.11	.7495 (not significant)
	ROS	6.77	7.66	.89	.0081

Table 2: Differences in values farmers and non-farmers assign to instream flow.²⁵

This example provides evidence supporting the proposition that although a person's economic livelihood may make a difference in her values with regard to water uses, it is far from being the only factor. Besides attitudes toward the environment, people may both have value differences and share common ground in thinking about social, cultural, spiritual, recreational, and public health aspects of water use. A person can identify with more than one "stakeholder" interest (e.g., might be a farmer, a fisher, a birdwatcher and a parent), while every stakeholder has not one, but multiple value perspectives.

Non-market values and concepts of water as "property"

The dominant values in a society may be reflected in changes in the ways its people choose to use water. Because water is scarce in New Mexico and surface supplies are fully (or over) appropriated, there are practically speaking few applications for "new" rights to appropriate unspoken-for water. Instead, interested parties usually apply for permits to transfer water from existing uses to new places and purposes, and often from surface to groundwater.²⁶

Decisions about reallocating water are usually made either through (a) political (or collective choice) or (b) voluntary market-like transactions between willing buyers and sellers. Non-market values such as those discussed above do not get represented well in market decisions. (This truth is embodied in the famous New Mexico saying, "Water flows uphill to money.") When money talks, people who believe in the importance of securing or preserving environmental, cultural, or other "public interest" uses of water often find it more effective to use

²⁵ Source: University of New Mexico Institute for Public Policy. 2000 (Spring). Public Opinion Profile data set (on file with author). Additional analysis performed by author.

²⁶ New Mexico Office of the State Engineer and Interstate Stream Commission. *2001-2002 Annual Report*. This is true for surface water, but because of perverse incentives in New Mexico statutes, not true of groundwater. Domestic and stock well applications comprised the bulk (5,708) of all new applications to appropriate groundwater in FY 2001-02. See page 6-3 and Tables 6-3 and 6-4. In most cases an application for a domestic well permit (allowing the withdrawal of 3 af/yr) cannot be denied by the State Engineer.

political arenas to express their views and get policy makers to pay attention. (Political arenas include legislatures, administrative regulatory bodies, intergovernmental negotiations, and of course, courts.)

Political processes often fail to acknowledge the importance of values that can't be quantified and expressed in "dollar" terms.²⁷ But reallocating water through market transfers is even more problematic. This is partly because of specific attributes of water. Unlike land, water is hard to "own." Because it flows, evaporates and seeps, it is hard to capture, and fails to respect boundaries. Surface supplies are highly variable and uncertain, and surface-groundwater interactions are difficult to measure.

Owning and marketing *which* water?

It is important to distinguish the characteristics of the physical thing or the abstracted concepts we call, generically, "water." There are at least five different things we may mean when we refer to water, and most of them are at least partially the product of human artifice (Table 3).

Things meant by "water"	Relevant characteristics
Water the substance – "wet" water	Increasing scarcity; variability of supply; subject to diversion and capture; subject to anthropogenic effects on quantity and quality.
The water resource "system"	The sources of a community or region's water supply, including watersheds, underground aquifers, climate, etc. Subject to anthropogenic influences on its sustainability.
"Water rights" – or "paper water"	Socially constructed rules permitting use and transfer water (state licensed), and subject to conditions imposed by law as well as by nature.
"Human right" to water	An internationally (but not universally) recognized entitlement to a sufficient amount and quality of water the substance needed for survival and health.
Water services	Operation and maintenance of systems that collect, treat, and deliver water to homes, businesses, farms, etc., making water available for use.

Table 3: Meanings assigned to "water"

²⁷ Jack Moss et al. 2003 (March 10). *Valuing Water for Better Governance*. Kyoto, Japan: Business and Industry CEO Panel for Water [Third World Water Forum]. 34-35.

The several aspects of water as a “good”

Though it is important – as the epigraph at the top of this article warns – not to confuse our social constructions of reality with the “essential” nature of things, it is useful to think about each of these aspects of water as possessing different characteristics. Each can be thought of as a different kind of “good,” producing individual or collective benefits. An extensive literature in welfare economics has developed that distinguishes between collective goods and private goods on the basis of two defining characteristics, exclusion and jointness of use or consumption.²⁸ Exclusion is the ability to deny a good to potential users unless they agree to the terms (e.g., the price) demanded by the seller, and is essential for that good to be supplied through the market. Where the cost or technical difficulties of exclusion make it infeasible, “free riding” is likely, and the good is supplied to any or all regardless of whether entry conditions are met. In the case of a vital natural resource, when the supply is abundant this creates no problem.

“Jointness” obtains when a good can be used or enjoyed by one person without denying its use to others. To the extent that many people can use a good without degrading it (breathing the air, for instance, or fishing in a stream), that good in that use exhibits a high degree of jointness. Many natural resources are, however, at least partially subtractible, in that each person’s use, once a certain threshold is reached, begins to subtract from its use and enjoyment by others, through degradation, crowding, etc.

In considering various aspects of water as a “good” it is helpful to treat exclusion and jointness of consumption as independent characteristics. Though in real cases they seem to vary by degree, rather than being absolute, they can be presented as a simple four-cell matrix (next page, Figure 1). Into this matrix it is then possible to array, for purposes of analysis, various aspects of “water.” It should become clear that in deciding in which cell each “belongs,” institutional choices, more than inherent attributes, are largely determinative.

Measurable quantities of wet water can be owned, bought and sold in specific instances. (For example, one can buy a half-liter plastic bottle of it in a convenience store for the equivalent of about \$2.6 million per acre-foot!) Water in plastic bottles can be considered a private good, as shown in the top left cell of the matrix. Like a pair of shoes or a doctor’s services, it is consumed individually, not jointly, and people unwilling to pay what it costs may easily be kept (excluded) from using it.

²⁸ This discussion draws extensively from Vincent Ostrom and Elinor Ostrom [1977]. *Public Goods and Public Choices*. Reprinted in McGinnis, M. D., ed. 1999. *Polycentricity and Local Public Economies: Readings from the Workshop in Political Theory and Policy Analysis*. Ann Arbor: University of Michigan Press. 75-103.

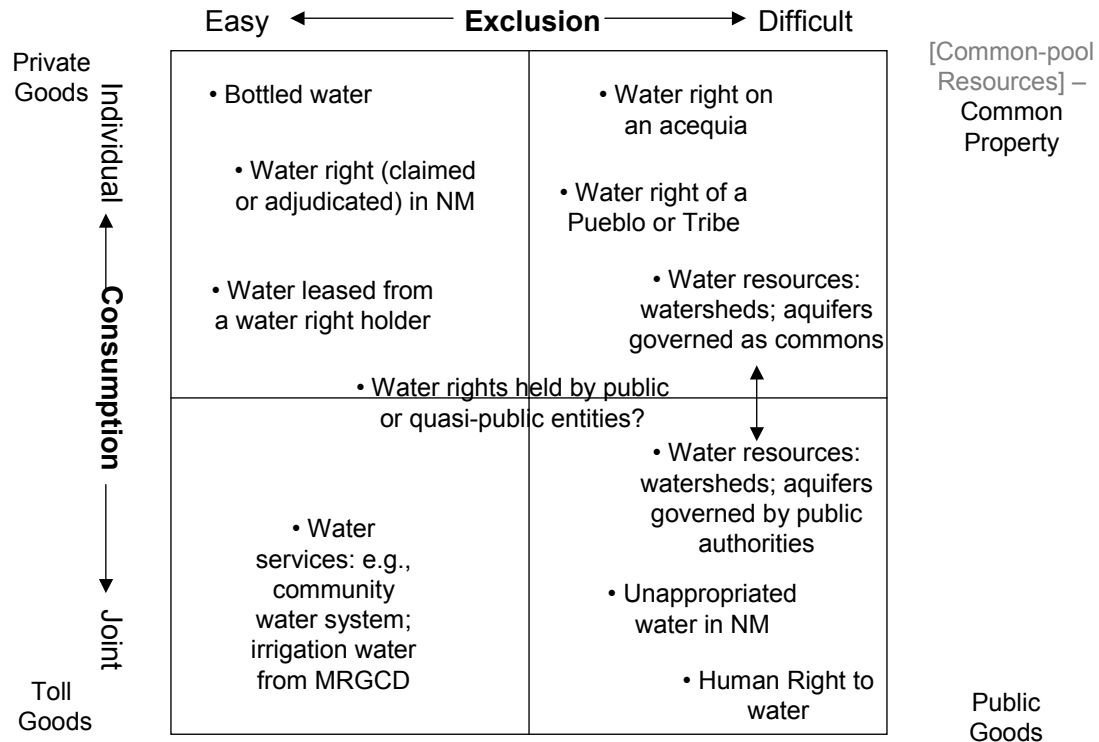


Figure 1: Consumption and exclusion characteristics assigned to various meanings of “water”

The lower-right cell of Figure 1 shows a “human right to water” as a public good. Specification of the meaning of a human right to water is clearly a matter of public policy, and a reflection of the value a society may place on such a right. The amount and quality of the water to which all persons may be entitled as a matter of right would be a matter of collective choice. Ensuring that the right is implemented would also require decisions about how to pay for and enforce it.

The end of the 19th and first half of the 20th centuries saw major public (and some private) investments in infrastructure to deliver water, at first for irrigation, and later for municipal and industrial uses, throughout the western United States. These produced benefits both for individuals and for the public at large. Though nominally intended to encourage small family farms, public subsidies promoting settlement of the West also provided incentives for the development of agriculture at an industrial scale, while the gargantuan size of construction projects required to dam and divert the flows of major rivers spawned the growth of corporations like Bechtel that could mobilize the resources to build the massive works. The public benefits, such as improvements in public health as a result of water and sanitation systems, are

undeniable, but this infrastructure has also produced public “bads,” or “negative externalities,” including reduction in stream flows and environmental degradation.²⁹

Though these impacts are nowhere near fully accounted for, American taxpayers at large subsidized the initial costs of these large projects and are still paying for subsequent remediation of their negative effects (through more recent environmental laws and regulations). But it is users who pay for the current operation and maintenance of the infrastructure that delivers water and takes away and treats wastewater in most communities. This is why water services can be classified as toll goods (the lower left cell in Figure 1). The people served jointly use the benefits, but users who don't (or can't) pay may have their water turned off. (Strict application of this rule, however, would violate the norms – the shared values – of any society that holds there is a human right to water.)

The most complex aspects of what we call “water” have to do with water resources and licensing rights to their use. How to characterize “the water resources of the State” is problematic. The multiple sources of New Mexico's water supply do not lie entirely within New Mexico, and the state has obligations under interstate compacts and treaties to pass through water to other states and Mexico. Though the typology of goods might suggest that the water resources, generically, should be considered “common-pool resources” (upper right cell in Figure 1), I take Bromley's point (with which this paper begins) as suggesting that *how* to classify water resources depends on the institutional arrangements people have individually or collectively chosen to govern and allocate those resources.

As the historical discussion above has suggested, although individuals are the appropriators and beneficiaries of resource flows, by acting jointly (collectively) people sharing a watershed or groundwater basin can become co-producers of a sustainable resource system.³⁰ As Ostrom has noted, no one can extract resource units—the flows—if the system is not being sustained. It follows that unless appropriators of a resource agree to operate according to a set of rules that provide a “fair, orderly, and efficient method for allocating resource units,” the resource system will fail to produce predictable benefits. And if the system in question fails to allocate benefits predictably, appropriators will have less motivation to contribute to its provision.³¹

²⁹ In New Mexico these include degradation of water quality, groundwater depletion, habitat destruction (and extirpation of native species), inundation of agricultural land and sites sacred to Native cultures (as at Cochiti), and in the case of the large irrigation projects, the loss of small riparian-based farming communities.

³⁰ “Co-producers” means those who—together with nature herself—construct and maintain a resource system, or who take actions that assure the long-term sustainability of a common-pool resource or other collective good.

³¹ Elinor Ostrom. 1990. *Governing the Commons*. New York: Cambridge University Press. 33.

IASCP members worldwide have been instrumental in demonstrating empirically that in many cases resource-dependent people in interdependent situations are capable of organizing themselves and crafting locally appropriate rules that enable them to take collective action to achieve joint benefits (i.e., the sustainability of the resources they depend on over time). This is so even though as individuals they all face temptations to “free ride, shirk responsibility, or otherwise act opportunistically.”³² We have seen above how New Mexico's self-governing acequias and Indian pueblo communities, by adopting cooperative strategies for sharing shortages, were successful in sustainably governing water resources prior to the imposition of Anglo-American institutions in the latter half of the 19th century and the early part of the 20th. For this reason I have relabeled this cell as common property to indicate that placing “water resources” here reflects collective choices about water governance.

The advent of New Mexico statehood coincided with the assertion that “all natural waters flowing in streams and watercourses” (which I take to include the resource system, rather than just flow units of wet water) “belong to the public.” Moreover, federal laws including the National Environmental Policy Act, the Endangered Species Act, the Clean Water Act, and others also assert public interest in the sustainability of the resource system. This is why water resources are also treated in the matrix (Figure 1) as public goods, whose benefits are “consumed” jointly by all, regardless of ability to pay. “Publicness” is thus in part a function of scale. (It's also possible for individuals to have private property interests in water resource systems, but because of the public interest in sustaining the resource base, the private uses are regulated by governments.)

As control over water resource allocations shifted from acequia communities to the state in New Mexico, so also did the allocation of water rights move from community-based regulation to assignment by the state to individuals. Like most western states, in asserting public ownership of “all natural waters flowing in streams and watercourses,”³³ New Mexico makes these waters “subject to appropriation for beneficial use.”³⁴ Thus unappropriated water can also be classified as a public good.³⁵

³² *Ibid.* 29.

³³ Groundwater basins and aquifers, as well as surface water, are also public. N. M. Stat. Ann. §72-12-1.

³⁴ N.M. Const. art XVI §2; N. M. Stat. Ann. §72-1-1.

³⁵ It is theoretically available for consumption jointly, but difficult for authorities to exclude access to, because of the variability in the amount supplied by nature, and because of ignorance about how much exists (poor measuring and monitoring). Most people agree that statewide there is no net surplus of water that can be termed “unappropriated,” though in some places in New Mexico there may be unappropriated groundwater resources, as in the Salt Basin.

Water rights are recognized or (since 1907) permitted by the state on the basis of the doctrine of prior appropriation: "Priority in time shall give the better right."³⁶ The "basis, measure and limit" of such rights is "beneficial use," with all such uses being treated equally.³⁷ Thus a water right is a right to use (usufruct), a license or permit from the state allowing the holder to use a certain amount of water (if it is available, and depending on priority in time that the right was established), for only as long as the holder is putting it to beneficial use. Physical water acquired under that permit (or right) may be leased. Once vested, the water right itself is inheritable, and it may be transferred (without losing priority of right) to another party who intends to put the water to beneficial use.

Water right transfers are subject to certain conditions. Water rights first put to use for irrigation are "appurtenant" to the land irrigated, and can only be "severed from the land" with the landowner's consent. A transfer may change the point of diversion or purpose of use of the water, but any change must be "without detriment to existing water rights" (non-impairment), "not contrary to conservation of water," and "not detrimental to the public welfare of the state."³⁸ Thus a water right is usually viewed as a somewhat restricted private property right, a private good enjoyed by an individual, who is able to exclude others from its enjoyment. So also may be an allotment of water (the substance) leased from a water right holder.

Many property rights regimes

To complete the notes on common property in Figure 1, the water rights of Indian Pueblos and tribes are not subject to state laws, but are federally guaranteed. Though individual members are beneficiaries of water apportioned under these rights, they are held by the community, and are governed as common property. Likewise, owing to recent state legislation (discussed below), water rights of acequia *parciantes* are once again subject to community control (as they were before 1907), and are also governed (to an extent) as local commons.

Besides having an interest in carrying out environmental laws, as noted above, the federal government asserts a variety of claims on water in New Mexico related to its property interests, including national forests and ownership interests in dams and irrigation works controlled by the

³⁶ N.M. Stat. Ann. §72-1-2; see also N.M. Const. art XVI §2.

³⁷ N.M. Const. art. XVI §3. In New Mexico beneficial use has historically been thought to require the diversion of water for an economic purpose. The idea that "instream flow" for the benefit of the ecological system or the health of specific species might be considered "beneficial" has only begun to win grudging acceptance. No New Mexico law recognizes such a "use" of water, but a New Mexico Attorney General's opinion in 1998 suggested that nothing in the New Mexico Constitution, statutes or case law would preclude it. Opinion of Tom Udall, Attorney General, Opinion No. 98-01, March 27, 1998.

³⁸ N.M. Stat. Ann. §72-5-23.

Bureau of Reclamation. Another federal interest is in the state's compliance with interstate compacts for water delivery on all New Mexico streams that are shared with other states.

Figure 1 and this discussion highlight the fact that many different property rights regimes and institutions govern the allocation of water, and make transferring water from one use or "owner" to another a complicated proposition.

Ownership, rules, and the operation of markets

What we may own, and what ownership means, are defined socially. The idea of "belonging to" means different things in different cultures at different times, and the "bundle" of rights and responsibilities that constitute "owning" something varies with circumstances, and seldom invests absolute control in the "owner."³⁹ Rules in every society govern these rights and responsibilities and the operation of markets. Classic conditions for successful markets include:

- the trade of discrete goods and services (pure "private" goods),
- in a marketplace of many buyers and sellers (where both have choices),
- where buyers and sellers are fully informed about what is being bought and sold, and
- where it isn't necessary to consider the effects of the transaction on other parties.

Most of these conditions do not usually apply to transactions in water. In a market, individuals determine value through autonomous choices (the price they are willing to pay, or to sell something for). Though non-market values (for instance, cultural, esthetic or moral preferences) may enter into an individual's decision-making, a potential buyer's wealth (ability to pay) can give him or her an advantage over competing buyers in a marketplace. Market outcomes tend to favor the preferences of the wealthy over those of the poor, and those with better access to information over those without such access.

Though they may be considered private goods, property rights in water are limited by public understanding of non-market values associated with water discussed above. Policy makers, too, understand that market-based transactions fail to take these fully into account. A "free, unfettered market" to facilitate transfers of water rights between willing buyers and sellers risks ignoring "third-party effects," including social and economic impacts on communities from

³⁹ A bundle of ownership rights to water might include some or all of the following: diversion, non-consumptive use (fishing, swimming, boating), consumption, improving, degrading, excluding others, leasing, and selling or disposing of one's interest. A society's rules may assign concurrent responsibilities, such as "beneficial use," not polluting or cleaning water used, and returning unused water to the resource system. Cf. Edella Schlager and Elinor Ostrom [1992]. "Property Rights Regimes and Coastal Fisheries: An Empirical Analysis." Reprinted in McGinnis (*supra*, note 28). 87-113.

which water rights are moved, and effects on stream flow, riparian habitat and water quality, among others.

Scarcity, water transfers, and institutional choice in New Mexico

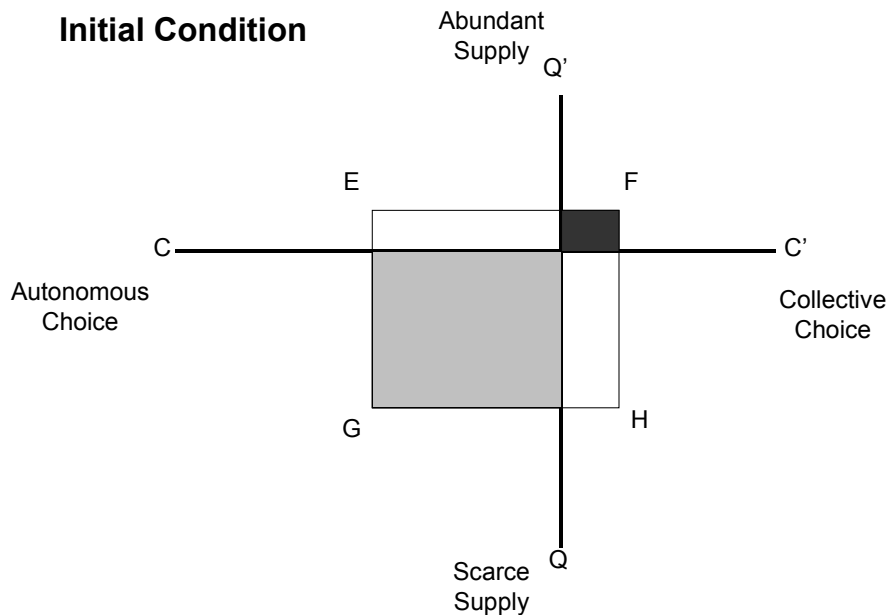


Figure 2a: Autonomous v. collective choice? Initial condition.

Institutional choices are constrained by scarcity (a function of population growth, “new” demands, and a likely long-term decrease in supply), and as scarcity increases, the relevance of market solutions for reallocating water rights is diminished. The diagrams, Figure 2a and 2b, illustrate two situations. In the first, domains of autonomous (market) choice and collective choice are represented along a horizontal line segment (C, C’), separated by an intersecting line segment Q, Q’, representing the available renewable supply, ranging from scarcity to abundance. The rectangle E, F, H, G defines the “arena” of available institutional choices.

In the “initial condition” Figure 2a, supply is fully adequate to meet demands, and markets between willing buyers and sellers can operate (light gray area) without hindrance to third party interests. The area of collective choice (dark gray) is small, and limited to necessary regulation of the market to protect the rights of other water right holders. A balance between autonomous and collective choice is found at X.

Figure 2b illustrates a mutually reinforcing process: greater scarcity produces non-market demands for alternative institutional arrangements, which may in some cases limit or even redefine property rights in water, shifting the intersection of Q with C to the left (Q_1). At the same time, assertion of non-market values (cultural, environmental, “area of origin” protections,

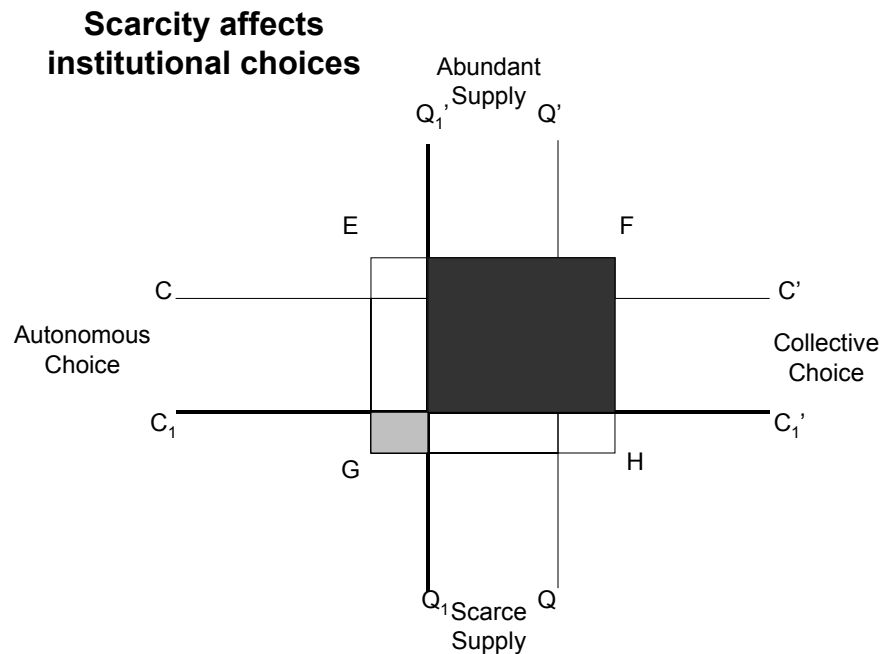


Figure 2b: Autonomous v. collective choice? Condition of scarcity.

and the like) adds to demands on a constrained supply, effectively increasing scarcity, shifting C downward with respect to Q (C_1). This decreases the area of autonomous choice.

As our case shows, this occurs because these non-market values are not effectively expressed through market transactions, but can be made effective by strengthening and institutionalizing collective choice processes. This may occur through legislation or regulation. But it can also include state support for local and regional autonomy, citizen and stakeholder participation, ability to assess transaction costs, and encouragement of negotiated resolution of disputes. Figure 2b shows that institutional choices under conditions of scarcity expand the area of collective choice, decrease the area of autonomous choice, and produce a new balance at Y.

Institutional dimensions of scarcity

Though wide variation and unpredictability in precipitation amounts from year to year are facts of life in the Southwest, only in recent years has it become obvious that water use is rapidly approaching the physical limits of the resource. The growth of cities as major users has engendered new conflicts among competing uses and jurisdictions. The scope of water demand is

no longer limited to the water rights of consumptive users; it has broadened to include growing public concerns about issues of water quality and about the health of riparian environments.

The broadest rules governing river management (including conjunctive management of groundwater) aim principally at achieving overriding federal policy purposes; they include interstate compacts and international treaties and a variety of environmental laws. However, except for federally reserved water rights applicable to federal installations and Indian tribes, water rights are recognized by (or created through) the State of New Mexico. Reallocations to meet federal demands take water from holders whose appropriative rights are based in state law.

An additional source of complexity in New Mexico is disparities between the formal system of rules governing the administration of water rights and informal rules based on custom and tradition. Though water rights are based on a holder's ability to establish beneficial use more or less continuously from a priority date, New Mexico has a strong tradition that senior rights based on irrigation are attached to "appurtenant" land, and that transfers should not be too easy. (This is further complicated by the fact that an estimated 85% of water rights claims remain unadjudicated.) Both individual and community interests have been asserted in successful objections to water right transfers from agricultural uses, creating uncertainty, making transfers more costly, and slowing the development of markets for water rights.

In the last decades of the twentieth century, as demands on the state's waters began to outstrip the annually renewable available supply, it appeared that the existing regimes for managing and allocating New Mexico's waters would be inadequate to balance the state's needs effectively. These tensions first resulted in the piecemeal enactment of legislation intended to correct particular problems or respond to local issues, and subsequently to a statute authorizing "regional water planning" efforts throughout the state.

Public Welfare, Planning and Participation

The impetus for these changes was a lawsuit brought by El Paso, Texas, in the early 1980s, against the New Mexico State Engineer's denial of its application to appropriate groundwater from New Mexico. A federal district court ruled that a state statute barring export of its groundwater violated the U.S. Constitution's interstate commerce clause. The Supreme Court ruling on which the court relied held that though a state may limit water exports to protect its citizens' health and well being, its laws must "regulate evenhandedly to effectuate a legitimate local public interest."⁴⁰ In response the NM legislature in 1985 strove to create a constitutionally valid rationale to prevent the "uncontrolled" transfer of water out-of-state.

⁴⁰ Bokum, Consuelo. 1996. Implementing the Public Welfare Requirement in New Mexico's Water Code. 43 *Natural Resources Journal* (citing *Sporhase v. Nebraska*). 681, 693.

The legislature amended several statutes, adding “conservation” and “public welfare” to existing requirements for non-impairment, as mandatory tests for approving or denying applications for new appropriations or water right transfers. Whether a proposed appropriation or transfer is deemed “not contrary to the conservation of water ... and ... not detrimental to the public welfare” applies to all applications, both interstate and within New Mexico.⁴¹ The legislature did not define “public welfare,” or establish priorities among uses.

Although the legislature intended to signal that not every “beneficial” use should necessarily be regarded as consistent with the public welfare, 80 years of precedent had sanctified the idea that property rights in water were based solely on “priority in time” – i.e., the value of a water right is to be measured only by its seniority, rather than any other measure of priority. Two years later, in passing the law that established a process and authorized funding for regional water planning, the legislature again ducked this issue, requiring only that planners give “an adequate review of water conservation and the effect on the public welfare.”⁴²

Competing claims on an increasingly scarce supply led to heightened awareness, among both traditional stakeholders and advocates for “non-consumptive” environmental and recreational interests, not only that the water supply was over appropriated, but also that the existing institutions for managing water were inadequate to resolve the conflicts apt to arise in any situation of shortage. Neither prior appropriation, nor its logical outgrowth, reliance on markets for reallocating senior water rights based on willingness to pay, appeared to offer a socially acceptable basis on which to craft new arrangements that could address these conflicts in a way that took political expressions of such public preferences seriously into account.

The 1987 legislation that authorized regional water planning reflected legislators’ recognition that values about water vary widely among regions within the state, and authorized regions to craft their own solutions in response to what they deemed a real threat to New Mexico’s water supply. The law itself provided little policy direction beyond asserting that the state’s “future water needs... can best be met by allowing each region... to plan for its water future,” and requiring that self-defined planning regions contain “sufficient hydrological and political interests in common to make water planning feasible.”⁴³ Slowly, a variety of organizations took shape as individuals with diverse water interests sought to accommodate each other and reconcile conflicts. By 1994, the Interstate Stream Commission and a number of

⁴¹ See N. M. Stat. Ann. §§72-5-6, 72-5-7, and 72-5-23 1978 comp. Citations are to the most recent updates to New Mexico Statutes Annotated, 1978 compilation. URL: <http://www.michie.com/resources1.html>.

⁴² N. M. Stat. Ann. §72-14-44C (6).

⁴³ N. M. Stat. Ann. §72-14-44D.

volunteers produced a Regional Water Planning Handbook,⁴⁴ including a “template” of elements to be addressed in all regional water plans. From an institutional choice perspective, the Handbook is significant in two respects.

First, most regional water planning groups had understood broad-based public participation to be necessary in creating any plan that might have a reasonable chance of being implemented by public authorities. The Handbook recognized these “rules-in-use” and included flexible but extensive requirements for stakeholder participation. The idea that public participation is essential, not only to local legitimacy but to a proper understanding of “public welfare,” thus became no longer simply a working assumption of regional planners, but an accepted tenet of state water policy making.

Second, the template requires regional planners⁴⁵ to gather and assimilate information about the physical, economic, demographic and historical characteristics of the region and its water uses; to understand and document the legal and institutional constraints affecting the region; to assess the water resources available in terms of the sources and amounts of water supply and its quality; and to document current uses and project future demand by a 40-year planning horizon. The requirement to develop shared time-and-place-specific information about these matters was explicitly intended to contribute to participants’ common understanding of the collective action situation facing everyone in the region. Thus, both the state’s mandates and its flexibility helped to structure the “action situation” faced by participants in each region.^{46 47}

As the urgency of the “drought” conditions and the State’s concern about meeting interstate stream compact requirements and federal mandates grew after 1996, political pressure mounted for creating an overarching State Water Plan. Though there isn’t sufficient space here to trace the evolution of the plan, both the process used to develop it and the major emphasis of its content support our institutional choice hypothesis. Building on the regional water planning process, the state legislature in 2003 mandated a strong public participation in the development

⁴⁴ New Mexico Interstate Stream Commission [NMISC]. 1994. Regional Water Planning Handbook.

⁴⁵ The Handbook uses the term “planner” broadly to refer to whoever is involved in any regional water planning process. The term does not imply a preference for leadership by a cadre of planning professionals. Instead, the Handbook emphasizes the interest of regional participants in its creation for encouraging “local people to express local concerns and discuss the difficult decisions faced by every community in New Mexico.”

⁴⁶ The elements of an action situation that affect actors’ choices of strategy are complex and involve an “epistemic element – the place of common knowledge and communities of shared understanding in decision situations.” Vincent Ostrom. 1997. *The Meaning of Democracy and the Vulnerability of Democracies: A Response to Tocqueville’s Challenge*. Ann Arbor: University of Michigan Press. 102.

⁴⁷ For a fuller discussion of the regional water planning process see John R. Brown. 2000. “‘Whisky’s fer Drinkin’; Water’s fer Fightin’! Is It? Resolving a Collective Action Dilemma in New Mexico.” *Natural Resources Journal* 43:1. 185-221.

of the plan, and though an initial plan was completed in less than nine months later, substantial public involvement (including consultations with tribes and acequias, regional water planners, and community members throughout the state) took place.

Substantively, a key strategy of State Water Plan, labeled “active water resource management” (AWRM), deviates markedly from the State Engineer’s historic emphasis on administration of water rights. One policy component of AWRM is that the State “promote water markets that enable the efficient movement of water rights...in accordance with applicable and legal safeguards.” To accomplish this, the State Engineer is to develop a strategy to enact statutes, promulgate regulations, and develop policies “to achieve efficient, localized water markets.”

Elaborating, the plan says that the State “must develop well-defined voluntary water rights markets that will allow the identification and dedication of existing water rights to new uses either on a temporary or permanent basis. As water demands ...increase, the demand for marketing of water through these voluntary transfers of existing water rights will grow.” But water markets are not just about water rights; the term encompasses “local, temporary shifts of use within an ... acequia; temporary following agreements for conservation and efficiency purposes;” acequia water banks; water banks “to provide a temporary ‘soft landing’ for junior users facing priority administration;” “expedited transfer policies” and water banks for providing reliable community water supplies; and finally, “efficiently functioning markets through which permanent transfers to new uses can be accomplished.”

Finally, the discussion notes that markets are “subject in their operation to many statutory safeguards and protections,” including evaluation of every proposed transfer for issues concerning impairment, conservation and the public welfare, and the plan acknowledges that “while effectively functioning markets are necessary... the State should ensure that effective regulations and policies exist that will protect ... the customs, culture, environment, and economic health and stability of the state’s diverse communities.” Additional language in another section of the plan elaborates on the need for these protections, including processes that provide for “full public notice and opportunity to protest.”⁴⁸

Recent New Mexico legislative initiatives

Actions by the New Mexico legislature in 2003 demonstrate a mixture of attitudes toward treating water rights as marketable private property. These examples illustrate that point.

⁴⁸ NMISC. 2003. *2003 State Water Plan*. Accessed at <http://www.ose.state.nm.us/water-info/NMWaterPlanning/2003StateWaterPlan.pdf>. (Last visited May 11, 2004.) 13, 16-17, 44-45.

1. The State Engineer is prohibited from approving an application to transfer a water right out of an acequia or community ditch if the acequia has enacted a bylaw to that effect and acequia commissioners have determined that the change would be detrimental to the acequia. The commissioners' decision can be appealed to district court.⁴⁹ This act, limiting the "private property" water rights of *parciantes* (members) on an acequia by strengthening the authority of its (presumably) democratically elected commission to deny transfers that could harm the acequia, restores some of the power once vested in acequia communities to assure local control over their water resources.
2. Acequias and community ditch associations are allowed to establish local water banks for the purpose of temporarily reallocating water "to augment the water supplies available for the places of use served by the acequia or community ditch." The law recognizes the customary water sharing arrangements of acequias by providing that no application to the State Engineer is needed and that banked water rights are not subject to loss for non-use.⁵⁰ It requires that reallocations of water take place within the acequia community, serving community interests, while making an acequia water bank and its operations not subject to approval by the State Engineer.
3. A process is established for water right holders in a single irrigation district in southern New Mexico to make 40-year leases of water to municipalities and other public and semi-public entities that form "special water users associations." The law allows transfers of leased water outside district boundaries for municipal use in Dona Ana County and for meeting compact delivery requirements to Texas. It restricts the State Engineer's jurisdiction to establishing criteria for lease applications, and limits his review to applicants' compliance with those rules, rather than reviewing each lease on its own terms. The district board has final approval authority for applications found to be in the interest of the district. Only irrigation district members have "standing" to object to a lease, and the grounds for objection and appeal are limited to compliance with the rules.⁵¹ Providing for long-term leases of water through a quasi-market mechanism provides a way for transacting parties to accomplish semi-permanent transfers while allowing a water right holder (the district itself or a member) to benefit financially from the lessee's use of the right. Limits on protests and appeals (who has standing, and on what grounds) shrink the basis for considering third-party effects, reducing

⁴⁹ Laws of New Mexico [Laws] 2003 ch. 135 and 82.

⁵⁰ Laws 2003, ch. 132 and 54.

⁵¹ Laws 2003, ch. 369.

costs of transacting the lease arrangement. Because it must approve any lease, the district, in essence, holds a monopoly position. This law promotes transfers, but not market competition.

4. The State Engineer is required to adopt rules to administer and enforce priority rights in stream basins where water rights adjudication has not been completed to stem overuse in such basins. He is also required to issue rules to promote expedited marketing and leasing of water in areas affected by priority administration, but these rules do not apply to acequias or to water rights on an acequia.⁵²

Both pieces of acequia legislation move in a policy direction quite different from the promotion of commodification embodied in the last two new laws described above.

Externalities, transaction costs, and the public welfare

An “externality” is a benefit or a cost that occurs as a byproduct of some economic activity that isn’t accounted for by the entity that produces it. A negative externality is a cost borne by third parties as a consequence of the production of some good, for which the producer is not required to pay as a cost of production. Water rights transfers can cause impacts to other individuals, communities, or the environment, for which the transacting parties bear no responsibility.

The State of New Mexico limits the types of externalities that can be considered in deciding whether to approve a water right transfer (or a lease of allotted water pursuant to a water right), by limiting who has standing to protest the change and the grounds for that protest. Any “person, firm or corporation or other entity” having a water right and arguing that approval of an application will impair that right has standing. But anyone objecting that granting an application “will be contrary to the conservation of water...or detrimental to the public welfare of the state” is required to show that she will be “substantially and specifically affected” by its approval.⁵³ Because “public welfare” in New Mexico water law has not been defined, it is unclear under what conditions a potential protest might qualify. However, it is clear that water right holders claiming impairment do not represent the full range of values and interests of stakeholders “who benefit from water resources and who experience losses as a result of water transfers.”⁵⁴

⁵² Laws 2003, ch. 63.

⁵³ N.M. Stat. Ann. §72-5-5. A 1985 amendment (N.M. Stat. Ann. §72-5-5.1) “affords standing for those asserting *legitimate concerns* involving public welfare and conservation of water *in a manner which avoids unduly burdening the administrative and judicial processes.*” (Emphasis added.)

⁵⁴ Bonnie Colby. 1995. Regulation, Imperfect Markets, and Transaction Costs: The Illusive quest for Efficiency in Water Allocation. In Daniel W. Bromley, ed. *Handbook of Environmental Economics*. Malden, MA: Blackwell. 481.

Raising transaction costs

Bonnie Colby argues that “The heterogeneous nature of water rights and changing social values associated with water make instantaneous, faceless and standardized transactions in water improbable and undesirable.”⁵⁵ As transfers have become more complex, “nowhere could such transactions be characterized as a ‘free market’,” because “every western state imposes conditions” on them. She argues that the goals of public policy should not be to minimize the cost of reallocating water. Instead, “appropriately structured transaction costs” can be used as a policy tool to “giv[e] transacting parties an incentive to account for social costs of transfers.”⁵⁶

Transaction costs (in this instance) are the costs to both the water right seller and buyer (or owner and lessee), of “doing the deal.” They may include hiring attorneys and engineers to develop information and help with the application, providing notice to potentially affected parties, responding to protests, negotiating changes in the application to mitigate impacts, and appealing unfavorable decisions. Some of these costs are imposed by public policy in regulating the market. “The ability to impose transaction costs, conferred by legal standing to file a protest, is crucial in determining which impacts will be considered. . . . Those interests that have no legal standing to file a protest generally do not have a seat at the bargaining table.”⁵⁷

For Colby, the attributes of the water resource and the multiple values competing for water use changes “confound attempts to define property rights in water ‘once and for all.’” She suggests settling “[d]isputes over the nature, magnitude and transferability” of water rights in specific situations “through negotiation among affected parties,” finding that “transaction costs created by potential objectors provide incentives for transfer proponents to consider potential externalities and resolve conflicts over the proposed transfer.”⁵⁸ She concludes that transaction costs imposed by state policies “are not arbitrary hindrances imposed on the marketplace,” but a reasonable means to account for the social costs of water transfers because they vary with the market value of the water rights being considered for transfer and the externalities associated with the transfer.⁵⁹

Defining “the public welfare of the state”

Using transaction costs as a tool of public policy assumes that objectors to a transfer who have “public welfare” concerns will have standing to raise valid protest issues, that they will

⁵⁵ *Ibid.* 482.

⁵⁶ *Ibid.* 483.

⁵⁷ *Ibid.* 480.

⁵⁸ *Ibid.* 485-6.

⁵⁹ *Ibid.* 499-500.

have timely information about the proposed transfer, and that the substance of their concerns will be fully considered. The fuzziness in New Mexico law about what constitutes “the public welfare of the state” and the reluctance of the Office of the State Engineer (OSE) and the courts to address this issue are impediments to building a coherent body of policy through a case-by-case process.

Although the 2003 State Water Plan only provides a framework for further policy development, including legislative proposals, the continuing planning process itself offers opportunities for dialogue among stakeholders with diverse and competing interests and value perspectives. The plan is intended to be a “strategic management tool” providing principles and criteria to guide the development of substantive content of policies (including “water rights transfer policies that balance the need to protect the customs, culture, environment and economic health and stability of the state’s diverse communities while providing for timely and efficient transfers of water”).

Conclusion: The Future of New Mexico’s Institutions for Governing its Water

Negotiating Water Rights⁶⁰

A water right is not just a license by the state recognizing a property interest in the flow of water from the resource system, but more fundamentally about relationships among people that determine how the resource is used. Likewise, water allocation⁶¹ and reallocation – even when they are ostensibly market transactions – involve elaborate processes of negotiation among individuals or entities with differing interests.⁶² These processes impose costs on buyers and sellers, as well as on third parties affected by changes who wish to raise objections to those changes. As we have seen, streamlining market arrangements is thought by some to be the key to making transfers of rights more efficient and flexible. But this runs counter to a significant body of non-market values held by New Mexicans, and risks ignoring important negative externalities.

Viewing reallocation as negotiated processes that bring all affected parties to the table, and allowing a broader set of interests and a wider array of externalities to be considered, may

⁶⁰ This section benefits from Bryan Bruns and Ruth Meinzen-Dick, eds. 2000. *Negotiating Water Rights*. New Delhi: Vistaar Publications [for the International Food Policy Research Institute]. 359.

⁶¹ Allocation – deciding who gets the right to use how much water (and in what order) – is accomplished through adjudication. Though embedded in a legal framework requiring litigation by the state against a water right claimant, it is increasingly a process intended to arrive at a negotiated settlement of a claim.

⁶² See Colby (*supra* note 54).

make some water transfers more expensive. Nonetheless, it provides a productive and flexible arena for conflict resolution.

Negotiation processes may be useful on many scales: individual applications for water right transfers; consideration of broader policy changes like “area-of-origin” protection; or large potentially involuntary reallocations to respond to Endangered Species Act or interstate compact requirements. In some negotiations, it is likely that the parties may have very unequal power and information. It is important to put in place procedures that reduce these asymmetries by providing everyone affected with access to relevant information or the resources to acquire it. Though potentially expensive, such processes are likely in the long run to incur fewer costs than result from the litigation that often follows from “command” decisions, or from private transactions involving only buyers and sellers.

More Collective Choice

As New Mexico's scarce water resources come under increasing pressure, more rather than less collective choice is likely to be built into its institutions for allocating and reallocating water to respond to multiple needs. This does not necessarily mean more State regulation, but can include State support for local collective action, as in the State's restoration of some acequia powers. As we have seen, institutional innovation has come in response to the political articulation of non-market human values, including the requirements of natural systems.

The State's strategy of active water resource management must adapt to these institutional changes, some of which decrease the authority of the State Engineer. The State's role is more likely to involve engagement in continuing processes of dialogue than establishing mechanisms for administering and recording autonomous market transactions. From the perspective of advancing democratic self-governance in the management of natural resources, it is advantageous for disputes – including protested transfers – to be settled through agreements negotiated among the disputants, who can bring to bear their own knowledge and creativity to craft solutions to their particular concerns. Strengthening all parties' negotiating capacity and recognizing the legitimate interests of all stakeholders – including advocates for public interests – in having a voice at the table must accompany any initiatives to make use of market approaches to facilitate transfers.⁶³

⁶³ Bruns and Meinzen-Dick (*supra* note 60). 37.