Irrigation Communities of the Upper Rio Grande Bioregion: Sustainable Resource Use in the Global Context

by

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ABSTRACT

The Río Declaration in 1992 brought attention to the importance of placing human settlements at the center of planning for sustainable resource management, including the incorporation of the traditional knowledge and practices available from the land-based peoples of the world. There is growing evidence that countries in both the Third World and the West are giving serious attention to alternative models of development that emphasize community-based management emanating from traditional values and institutions embedded in local cultures. A water rights transfer case study from the upper Río Grande bioregion in the western United States illustrates the need for policy-makers and the public at-large to consider cultural values alongside economic and ecologic-environmental factors when planning for a common sustainable future. Also, people's democratic institutions, such as the acequia [ditch] organizations of northcentral New Mexico, need to assert their historic rights to life-sustaining water resources by taking concerted actions to preserve the resource base on which they and other stakeholders in the region depend.

INTRODUCTION

In June of 1992 the Río Declaration brought attention to the importance of placing human settlements at the center of planning for sustainable resource management. Seeking to build on the 1972 United Nations Conference on the Human Environment, the Río de Janeiro agreements called for the establishment of a global partnership which would recognize the interdependent nature of earth's resources across states, key sectors of society, and people. In the very first principle, the declaration proclaims that "[h]uman beings are at the center of concerns

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for sustainable development" and are "entitled to a healthy and productive life in harmony with nature."[1]

Moreover, states should strengthen the capacity of concerned citizens to participate in decision-making processes that affect their local communities. To do so, citizens must have access to technical knowledge developed by public authorities and the scientific community. By the same token, states should incorporate the traditional knowledge and practices available from the indigenous peoples of the world. They too have a vital role to play in the management of environmental resources and the achievement of a sustainable world future.

> States should recognize and duly support their identity, culture and interests and enable their effective participation. The environment and natural resources of people under oppression, domination and occupation shall be protected.[2]

More recently, the President's Council on Sustainable Development endorsed stewardship as an ethic or value to be encouraged by U.S. government policies, especially by recognizing and rewarding local stakeholder approaches to the management of natural resources.[3]

Around the globe, the traditional and political rights of land-based peoples are increasingly threatened by demands placed on the limited resource base and life support systems critical to continued survival. From region to region, sectors of the dominant economic and political order encroach on the grazing lands, river and irrigation canal systems, forests, wildlife areas, fisheries, and other "common-pool resources" that have sustained local cultures over many generations.[4] For the most part, these resources have been renewable precisely because of human adaptation strategies at the time of initial appropriation coupled with a strong conservation ethic to manage the resources in deference to the future livelihoods of heirs born and yet to come. For example, many such communities in arid lands throughout the world somehow manage to eke out an existence in rather harsh environments where human life had not previously existed.

The Río Declaration and other reports on environment and development have created renewed interest in traditional management systems that have withstood the test of time, irrespective of differences in climate, topography, physiographic barriers, or other limitations on

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1. *Río Declaration on Environment and Development*, June 14, 1992, Principle 1, 31 I.L.M. 874, 876 (1992).

2. *Id.* at Principles 22, 23.

3. PRESIDENT'S COUNCIL ON SUSTAINABLE DEVELOPMENT, FINAL REPORT, White House Doc. (March, 1996).

4. *See generally*, ELINOR OSTROM, GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION (1990).

human survival. Though diverse from one geographic setting to another, these practices are highly participatory, requiring stewardship of the community properties by the very cultures that depend on the resource base.

In this way, decisions are made that ensure the continuance of regional peoples who control and manage the property for themselves and future generations. Repeatedly, rural development interventions fail to utilize this reservoir of indigenous knowledge; but there is growing evidence that countries in both the Third World and the West are giving serious attention to alternative models of resources use that emphasize responsibility to the community and which emanate from traditional values and institutions embedded in the culture.[5]

Field research and case studies conducted in the Southern Hemisphere, for example, have documented that sustainability of earth's resources means more than the preservation of biodiversity.[6] Often, rural peoples who live closest to or in the midst of valuable natural resources are economically poor, and have the least to gain from practices which would exploit and consume the environment around them. They have a stake in acting as custodians of the resource base on which their cultures depend. "Excluded from management of their local environment, local people cease to act like stewards, and [may] become poachers."[7] From Ghana to Mexico and the Philippines, development projects aimed at reducing poverty in rural sectors have failed because local environmental knowledge and cultural values were not incorporated, but instead were supplanted with capital intensive technologies ostensibly to "modernize" underdeveloped regions.[8]

Increased awareness of the importance of local stewardship by world commissions and independent states is not by itself a panacea nor a guarantee that rural poverty will be eradicated and natural resource areas preserved. The threats to traditional life support systems persist and intensify despite multiple world summmits and numerous studies. The real struggles have been and will continue to be at the micro and bioregional levels notwithstanding any variations in ecology, geography, culture or politics from site to site. More research is needed to investigate and compare the context of resource-based conflict around the world. How do indigenous communites themselves react when confronted with the extreme pressures of development or the effects of global markets?

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5. FIKRET BERKES, COMMON PROPERTY RESOURCES: ECOLOGY AND COMMUNITY-BASED SUSTAINABLE DEVELOPMENT 3-5 (1989).

6. MICHAEL REDCLIFT & COLIN SAGE, STRATEGIES FOR SUSTAINABLE DEVELOPMENT: LOCAL AGENDAS FOR THE SOUTHERN HEMISPHERE (1994).

7. *Id.* at 11.

8. *Id.* at 188.

Are their values compatible with the dominant institutions that control or regulate the resource base from the outside? What are the specific roots, public or latent, and the social dynamics of the claims and counter-claims regarding the access to and use of natural resources in the bioregion? How can government institutions validate and empower regional cultures to retain control over the resources they need to survive? Lastly, what action strategies and local initiatives can indigenous organizations themselves undertake to safeguard their roles as stewards and resource managers?

The reservoirs of local knowledge, as well as the potential for conflicts in values, can be found throughout the world, not just in the so-called underdeveloped countries.[9] Natural resource exploitation exists everywhere, as does rural poverty. The purpose of this article is to present the results of field work conducted in the uplands bioregion of the upper Río Grande from 1994 to 1996, related to the acequia irrigation communities located on the Nuestra Señora y Sangre de Cristo Land Grant, popularly known as the Town of Anton Chico Land Grant.[10] For identification, the land grant itself straddles both San Miguel and Guadalupe counties in northcentral New Mexico, while the greater bioregion of the upper Río Grande originates in southern Colorado and plows through New Mexico all the way to El Paso.

Most of the data and analysis included in this portion of the bioregional study centers on the northcentral counties of New Mexico and on the uppermost reaches of the Río Pecos, a tributary to the Río Grande. A case study of this location within the context of a major developed country in the northern hemisphere tests the global issues and research questions raised earlier.

In the next century, the upper Río Grande bioregion and the adjacent border with Mexico will become even more diverse. Population and economic growth will tax the resource base of this arid environment, producing further stresses and conflicts, especially over water use priorities and other value-based questions. Documentation of conflicts, as in the water transfer case reported in this article, hopefully, will foster dialogue and mutual learning across the many boundaries-economic, cultural, and political-that keep the regional constituencies apart.

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9. See OSTROM, *supra* note 4; *see also* BERKES, *supra* note 5; REDCLIFT & SAGE, *supra* note 6.

10. *See* Michael J. Rock, *Anton Chico and Its Patent*, *in* SPANISH & MEXICAN LAND GRANTS IN NEW MEXICO AND COLORADO 86-91 (John R. & Christine M. Van Ness eds., 1980).

The Setting

In the arid uplands physiography of northcentral New Mexico, watercourses and their tributaries appear as the single most defining feature critical to all forms of life, biotic and human. For centuries, this region has been a homeland to the aboriginal peoples: the Pueblo Indians, and the descendants of the first European settlers, the hispano norteamericanos. Both cultures revere water and treasure it as the virtual lifeblood of the community. The upper Río Grande, the Río Chama, the upper Río Pecos and other rivers and creeks stand out as the dominant natural systems of this southern Rocky Mountain province. Nestled within the canyons and valley floors, tiny villages dot the landscape; their earthen ditches, native engineering works known locally as acequias and lateral sangrías, gently divert the precious waters to extend life into every tract and pocket of arable bottomland.

Since the early 1960s, however, water markets and the demographic forces behind them, such as population growth, in-migration and land development pressures, have placed these fragile communities at great risk. No one disputes that emerging water markets, if left unchecked, will sever water from the traditional agricultural uses in the region, and cause economic stress to rural villages. Lesser known, however, are the broader impacts on the regional and state economies that can result if these historic villages literally dry up. Regional economies are based largely upon the cultural tourism business of the state as well as the high-tech industry companies. These businesses often locate in New Mexico because of the cultural, scenic, recreational and other enchanting amenities which the rural landscapes of northcentral New Mexico provide.

The main body of this article begins with a background analysis of New Mexico water rights law from the perspective of acequia traditional uses. Next, a case history of an attempted water rights transfer from one of the land grant communities on the Río Pecos illustrates the issues of encroachment and the potential destruction of a way of life. In particular, the case study highlights a need for policy-makers and the public at-large to consider cultural values alongside economic and ecologic-environmental factors when planning for a common sustainable future. Lastly, the article concludes with action strategies and initiatives which can be taken by the acequia communities in concert with elected officials, governmental agencies, voluntary organizations and private foundations.

NEW MEXICO WATER RIGHTS LAW

Since 1891 and later codified in the Water Codes of 1905 and 1907, water resources in New Mexico have been allocated according to the doctrine of prior appropriation prevalent in most western states.[11] Water is a public commodity subject to state regulation and control based on prior use, "first in time, first in right," and the application of water to beneficial use. Unlike the provisions in states that adhere to the riparian doctrine, water rights in New Mexico are based entirely on actual prior use and do not run automatically with any land which happens to border a watercourse or waterbody.[12]

The historic and cultural practices in the acequia communities of New Mexico do not fit neatly into either the modern prior appropriation doctrine or the riparian doctrine. They clash perhaps the most with the doctrine of prior appropriation on the question of severability of water rights from appurtenant lands.[13] Some of the dichos [folk sayings] from the region express this relationship poignantly:

> "La tierra es la madre, y el agua es su sangre."
> [Earth/land is our mother, and water is her blood.]
> "Sin agua, la tierra no vale nada."
> [Without water, the land is of no value.]

Some parts of New Mexico were settled much earlier than the communities located within the Anton Chico Land Grant, the earliest Spanish settlement dating back to 1598 when New Mexico was a province on the northern frontiers of New Spain.[14] Spanning a period of some 400 years, custom and tradition generally provided that neighboring acequias were all entitled to water both for domestic and irrigation purposes, regardless of priority dates or periods of limited water quantities. Even in times of drought, water rotation schedules and other conservation practices insured that everyone would have a turn. To sever water rights permanently from any parcel of irrigable land was unimaginable and counter to the initial principles of settlement and the gravity flow irrigation techniques which made agriculture possible in this arid environment.

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11. IRA G. CLARK, WATER IN NEW MEXICO: A HISTORY OF MANAGEMENT AND USE 43 (1987).

12. DAVID H. GETCHES, WATER LAW IN A NUTSHELL 3-7 (1984).

13. *See* CLARK, *supra* note 11, at 15, 37, 41.

14. MARIA LUISA RODRIGUEZ-SALA ET AL., EXPLORADORES EN EL SEPTENTRION NOVOHISPANO 223 (1995).

Traditional practices have persisted within the acequia communities and so have time-tested technologies and water management institutions. In most villages, the acequia association, made up of three elected ditch commissioners, a mayordomo [superintendent or "ditch boss"], and the parciantes [irrigators] themselves, is the only form of local government at the subcounty level. The ditch rules that govern acequia affairs, and much of New Mexico acequia water law, for the most part simply codify the norms already imbedded in custom and tradition. When internal disputes arise, the acequia commission is the final arbiter. While ditch officials and members are aware of the superimposed (Anglo-American) version of prior appropriation and the related notion that water rights are moveable and severable from the land, historically parciantes have not been forced to choose between the two opposing systems in any legal sense. Until the 1960s, the water markets in New Mexico were not strong or active enough to pose any direct threat to local uses. The business of managing the acequia waters continued much as before: the local ditch rules based on custom and tradition carried the force of law.[15]

Traditional ways and historic statutes have guided the acequia water users in their day to day decision-making and ditch operations. First, the Kearny Code of 1846,[16] adopted when the New Mexico territory fell into United States possession, recognized the existing watercourses and clearly stated they should remain undisturbed in accordance with "las leyes hasta aquí vigentes" [the laws heretofore in force]. Second, the territorial laws enacted by the legislative assembly in 1851[17] and expanded in 1852[18] reiterated and confirmed into law the provisions of the Kearny Code, including the legal force of prexisting ditch "arreglos" or rules:

> Que de las acequias ya establecidas no se embaraze su curso. [That the course of ditches (acequias) already established shall not be disturbed.] (Sec. 8, Rev. Statutes and Laws of the Territory of New Mexico, Art. I, Ch. I, Act of the 20th July, 1851.)
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> Que todos los ríos y corrientes de agua en este Territorio, anteriormente conocidos como acequias públicas, son por este decreto establecidos y declarados a ser acequias públicas. [That

15. For a review of acequia laws and ditch rules, *see* PHIL LOVATO, FOUR CORNERS REGIONAL COMM'N, TECHNICAL REPORT NO. 1, LAS ACEQUIAS DEL NORTE (1974).

16. ORGANIC LAW FOR THE TERRITORY OF NEW MEXICO COMPILED UNDER THE DIRECTIONS OF GENERAL KEARNY, *in* OCCUPATION OF MEXICAN TERRITORY, S. Doc. No. 896, 62d. Cong., 2d Sess. 10,175 (1912).

17. N.M. REVISED STATUTES AND LAWS (Studley 1865).

18. *Id.*

> all rivers and streams of water in this Territory, formerly known as public ditches (acequias), be, and are hearby established and declared to be public ditches (acequias).] (Sec. 9, Act of 7th January, 1852.
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> El arreglo de las acequias que ya están trabajadas quedar establecido tal como se hizo y permanace hasta hoy . . . . [The regulations of ditches (acequias) which have been worked, shall remain as they were made and remain up to this day . . . .] (Sec 21, Act of 7th January, 1852.)

More recently, the New Mexico legislature added water conservation and public welfare criteria to the New Mexico water transfer statute. The State Engineer is now instructed by this 1985 statute to endorse and approve permit applications only if the proposed transfers do not impair existing water users "and are not contrary to conservation of water within the state and not detrimental to the public welfare of the state."[19]

The statute also stipulates that potentially affected water users, such as political subdivisions and agencies of the state, have standing to protest proposed changes or transfers,[20] as the Anton Chico Land Grant acequias did in the case study which follows. The case study is based on field work conducted during the summer of 1994, the last few months of the conflict. Other sources of data included a community survey of water values, newspaper accounts, interviews, acequia organizational papers and analysis of published and unpublished secondary data.

CASE STUDY: WATER RIGHTS TRANSFER ON THE UPPER RIO PECOS

In the summer of 1987 the Office of the State Engineer notified the Pecos River Learning Center, Inc. (PRLC), based in Santa Fe, that the water supply wells for their international retreat and executive training compound located in adjacent San Miguel County were overdrafted and would have to be shut off unless PRLC acquired more water rights beyond their allocation of 6.0 acre feet per year drawn from two domestic wells. As of July 8, 1987, just six months into the water year, PRLC had already drawn 13.64 acre feet, more than twice their annual entitlement.[21]

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19. N.M. STAT. ANN. § 72-5-23 (Michie 1978, Repl. Pamp. 1985 & Cum. Supp. 1996) (appropriation and use of surface water).

20. *Id.* § 72-5-5.

21. NORTHERN N.M. LEGAL SERVICES, SUMMARY OF EVENTS RELATING TO THE ACQUISITION OF WATER RIGHTS BY THE PECOS [RIVER] LEARNING CENTER (1992) (on file with N.N.M.L.S.).

PRLC was fairly new to the area, having opened its training facility in 1983. PRLC assisted corporate clients to prepare for and perform competitively in business environments of the future. The firm owned and operated the Pecos River Ranch and Conference Center, 45 miles outside of Santa Fe, where the training activities took place. Occupying some 1,600 acres nestled in the foothills of the Sangre de Cristo mountain range on the highway to Las Vegas, New Mexico, the Ranch compound included conference rooms and facilities, a restaurant, and hotel accommodations for 50 guests. To supply the needs of the Ranch and its conference participants, the two wells on site pumped groundwater from an aquifer which is hydrologically connected to the Río Pecos.

By the mid-summer of 1987, the Ranch had exceeded its water allotment of 6.0 acre feet of water. As an emergency, PRLC obtained some 31 additional acre feet through an arrangement for surface water rights leased from two property owners in the neighboring farm village of San José, a few miles south of the PRLC Ranch in San Miguel County.[22] The State Engineer Office approved the leases through a five year period from 1987 through 1991, sufficient time for PRLC to develop a permanent source of water rights. But PRLC waited until just three and a half months prior to the lease expiration date of December 31, 1991, before initiating a process to purchase additional water rights.

PRLC decided to move forward with what it thought would be a routine market transaction: to acquire permanent water rights from a surface water user who owned land some 40 miles downstream from the training compound. However, the implications of this transfer for the community were intolerable. The transfer would sever water rights from 45.35 acres of irrigated farmland located on the largest, still-functioning community land grant in the Hispanic American heartland, the Nuestra Señora y Sangre de Cristo [Our Lady and Blood of Christ] grant at Anton Chico.

When PRLC took the initial steps, in the fall of 1991, toward the purchase of 45.35 acre feet of water rights from Mr. Amadeo Tenorio who held water rights on one of the ditches on the land grant, the Bado de Juan Paiz Ditch located in Dilia, the surrounding communities rose in protest. From the perspective of the acequia communities, this potential transfer of surface irrigation water rights out of the land grant area was unprecedented. For over 160 years of continuous occupation, water and land uses within the grant had remained whole and intact. At stake were more than the 45.35 acres of farmland that would lie fallow permanently.

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22. *Id.* at 2.

The entire land grant economy was threatened. If the transfer was approved and the sale went through, perhaps other water right owners in need, now or later, would sell out. The folk wisdom of the local culture spoken in the native dialect, captures the idea:

> "Si se cai un grano de maíz del saco, se cai todo." [If one grain of corn drops out of the sack, all of it falls out.] "Si se rompe el corral y se sale una cabra, se salen todas." [If the corral is broken and one goat slips out, they all escape.]

A few months following publication of the transfer notice, area residents vehemently expressed their opposition to the proposed transfer at a public meeting held in April of 1992. They expressed the following concerns: the severing of water rights from ancestral farmlands goes against local customs and values; the transfer would prevent the gravity flow techniques of acequia irrigation which require sufficient flow and head from the river; the transfer from one parcel would break the link in the chain, creating a domino effect of other sales and threatening the social fabric of the community.

The concern over volume of water flow was especially worrisome to these downstream acequia users. The PRLC application had been for ground waters. The Tenorio water rights would function as an even swap, i.e., the retirement of surface (irrigation) water rights downstream in order to offset the increased water that the applicant would be permitted to pump upstream. But the acequia users to the south were not convinced. The extra pumping, they reasoned, would lower the watertable and reduce the quantity of water in the river. The decline in water flow volume would adversely impact the ancient gravity flow ditches. The result would be that the lower water levels in the river might not be sufficient to "push" the water into and through the acequias and their lateral sangrías.

A short time after the community meeting, PRLC decided not to pursue the purchase of Mr. Tenorio's water rights. Instead, as in 1987, PRLC opted for renewal of the lease with one of the San José farms, this time for 23.87 acre feet. The State Engineer approved their lease renewal and PRLC temporarily withdrew the water rights transfer application.

A year and a half later, on October 22, 1993, Mr.Tenorio and PRLC resurrected their efforts toward a water sale for permanent transfer. Mr. Tenorio applied for a permit to change the point of diversion and also the purpose of use from surface to groundwater. The impacted acreage was reduced from 45 to 30 acres. The legal notice stated that these would be a transfer of water rights that had heretofore been "diverted from the Pecos River via the Bado de Juan Paiz Community Ditch" and that this transfer would occur "by ceasing the irrigation of 30 acres of land described as Dilia . . . of the Anton Chico/Preston Beck

grant . . . ."[23] If approved, the Pecos River Learning Center would purchase the water rights for the purpose of supplementing "the current use of household and other domestic use, drinking and sanitary purposes" and the watering of the landscape "incidental to commercial enterprise purposes within the Pecos Ranch Partnership . . . ."[24]

The refiling of the application prolonged the controversy. The reduction in impacted acreage from 45 down to 30 acres did not allay the fears of the acequia water users from Dilia and the other Anton Chico Land Grant communities. The protestations continued. Ditch officials and other users would not accept any arrangement that would sever water rights from properties within the land grant. They were not opposed to Mr. Tenorio exercising his right to sell, if only he sold the land along with the water rights. They were adamant that the water rights remain in the community, as tradition and custom had always dictated.

Settlement within the Anton Chico Land Grant boundaries had been made possible by the presence of the waters on the Río Pecos. At the time of conveyance to the initial group of petitioners in 1822, Alcalde Manuel Baca had stipulated that the grant should be held in common for themselves and for future settlers, and furthermore, the first labor of the town should include the digging of the ditches and other works for the common good.[25] Today, the land grant boundaries still include the east and west banks of the Río Pecos, making the river function much like an acequia madre [mother ditch] with ability to irrigate a wide physiographic area. Diagonally from northwest to southeast, the river flows through the grant for a distance of some 50 miles. From the time of first occupancy to the present, the land base and the availability of water have been essential to survival. For example, at a community meeting in the summer of 1994, while the Pecos River Learning Center was still in pursuit of Mr. Tenorio's water rights, the acequia officials were clear about this symbiotic relationship. If water rights are transferred out of the community, they said, all will be lost[26],

> También la merced, porque si no hay vacas, para qué se usa la merced? [Including the land grant, because if we have no cows, what good is the grant?]

When asked how the merced commons and the water rights from the Río Pecos worked together to support the communities, again their

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23. State Engineer, *Legal Notice*, GUADALUPE COUNTY COMMUNICATOR, Nov. 25, 1993, at 9.

24. *Id.*

25. ROCK, *supra* note 10, at 87.

26. Interview with acequia officials at La Loma Community Center in La Loma, New Mexico (July 23, 1994).

responses were unequivocal. The merced is 130,000 acres [the commons portion] and surrounds all the villages for use as a pasteo de animales [grazing land for livestock], they said. All of the land grant heirs have access to these lands, primarily for use as summer grazing for el ganado [livestock]. But in the wintertime, the livestock are fed bales of hay which are grown on the irrigated private lands of each heir, initially a total of 8,000 acres across the land grant. The ditch water is essential for the production of hay as wintertime feed. Another community use of river water occurs during periods of drought when the livestock have to be brought down from the open pasteo in order to provide them with drinking water right at the river; or water is taken to them by truck in tanks. "In drought years, you can see the cowboy trucks line up on the river banks; they take turns going up the hill."[27] Later in the fall, the rastrojo [stubble] from corn or other crops serves as supplemental forage out in the irrigated fields. Alternately, some families plant a winter cover crop as a source of food for the livestock.

The high value placed on the connection between land and water resources was widely shared by the land grant heirs and their other acequia neighbors. Their unrelenting opposition to the proposed transfer of water rights out of the grant boundaries ultimately resulted in a compromise solution satisfactory to them. In August of 1994, the State Engineer denied the request for the transfer of the 30 acre feet that had been pending; instead, he approved the continuation of the leasing agreement with the lessor from the community of San Miguel, this time for 10 acre feet.[28] The lease would be in effect for two more years; the Pecos River Learning Center would have to apply for a new permit beyond that period should it continue to need additional water for its enterprise activities. Appropriately for the protestants, a newspaper byline which reported the final outcome, read: "State nixes water-rights sale: Move protects Anton Chico."[29]

POLICY ISSUES AND ACEQUIA PERSPECTIVES

The PRLC applications described above are valuable case studies. Anton Chico and other acequia communities can learn from the PRLC controversy to fashion public welfare testimony for similar future applications for water transfers. These public welfare arguments are illustrative only and are not meant to provide any conclusive evidence nor legal advice. The next application for a water transfer may be very

27. *Id.*

28. Aaron Baca, State Nixes Water-Rights Sale, THE NEW MEXICAN, Aug. 31, 1994, at B3.

29. *Id.*

different from the PRLC case, and therefore may involve a different set of issues that need more detailed analysis and appropriate testimony.

Also, the acequia users should not rely solely on protestant objections. Direct community actions in the long run may in fact best express and demonstrate the public welfare values peculiar to the historic acequia communities of New Mexico. Examples of some pro-active strategies and initiatives are provided later. Next, however, this article highlights three public interest perspectives generated from the upper Río Pecos case study and other related water resources research: the cultural aspects of water resources, the protection of keystone communities, and acequia sustainable development.

The Cultural Aspects of Water Resources

The notion that water as a natural resource has a public value and justifies governmental regulation is not new. Environmental laws and other government policies already intercede in the market to protect certain plant and animal species that depend on water habitats. Also, a battery of environmental laws and regulations prohibit water pollution and contamination. Other interventions mandate conservation practices. Furthermore, government programs exist to subsidize some sectors and industries which require large amounts of water for their operations.[30]

Market interventions have been designed in support of three basic values: economic, ecologic-environmental and social. Of the three, economic values have been the most often asserted, are most easily quantified, and have been the most subsidized. Hydropower infrastructure, which supplies huge amounts of energy required to stimulate industrial, municipal, and agribusiness expansion is a good example of economic intervention. Starting in the 1930s, cost-benefit models have provided decisionmakers with the favorable ratios needed to justify large public expenditures for dams, irrigation waterworks, and other river basin development projects, especially in the western states. However, the era of these large scale projects financed by the federal government has ended, as the debate over water policy has now shifted from the historic preoccupation with development to the inclusion of other values.

Next in the order of quantification are ecologic and environmental values: stringent controls against water pollution, protective measures to safeguard water habitats necessary for plant and wildlife species, and other similar environmental protection programs still growing in scope

30. *See* Charles T. DuMars & Michele Minnis, *New Mexico Water Law: Determining Public Welfare Values in Water Rights Allocation*, 31 ARIZ. L. REV. 815, 828-30 (1989).

and enforcement resources. The Clean Water Act,[31] the National Environmental Policy Act,[32] the Wild and Scenic Rivers Act,[33] and the Endangered Species Act[34] all intervene to support environmental values. At the state level, most western states, not including New Mexico, by now have enacted statutes requiring a minimum amount of instream flows designed to support ecologic values by keeping water conveyance channels (rivers and streams) wet year round.

Social values in water policy and law, being much more diverse and the least understood, are the least quantifiable of the three values. Nevertheless, various policies and laws that protect social values have been in effect for a long while. Interestingly, they are not usually thought of as expressions of social policy or as market interventions. For example, water rights allocations awarded by the federal government to reservation areas such as national parks and Indian territories probably serve as the best examples of an early type of water policy with broad social purposes. Other social values often are obfuscated because they are actually secondary results from projects which espouse other values. For example, hydropower installations also provide recreational uses incidental of the primary benefits to agribusiness, manufacturing industries and municipalities. However, when communities seek regulatory support for social values independent from other values, support is more difficult.

Perhaps the most difficult social values to assert are precisely those that the acequia communities of the Anton Chico Land Grant were attempting to have protected: historic and cultural values. With increasing development pressures and the emergence of new water markets, transfers of water use from agricultural to municipal and industrial uses in New Mexico threaten to dry up the farmlands of the state. The greatest pressures will be on the so-called "lower-value uses" such as the subsistence and small scale farming practiced by the majority of acequia water users. Market efficiency proponents support these water transfers because "[t]hey reallocate water from low-value crop production or meadow irrigation to more valuable second home developments, snowmaking, new suburbs, and other uses for which individuals are willing to pay far more for the water than its value for crop production."[35]

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31. Clean Water Act, 33 U.S.C. §§ 1251-1387 (1994).

32. National Environmental Policy Act, 42 U.S.C. §§ 4321-4370 (1994).

33. Wild and Scenic Rivers Act, 15 U.S.C. §§ 1271-1287 (1994).

34. Endangered Species Act, 16 U.S.C. §§ 1531-1544 (1994) .

35. NATIONAL RESEARCH COUNCIL, WATER TRANSFERS IN THE WEST: EFFICIENCY, EQUITY, AND THE ENVIRONMENT 174-175 (1992).

The public policy challenge is to find a better way to account for the historic and cultural values of traditional water uses in the region. In numerous surveys and case studies[36] they conducted, F. Lee Brown and Helen Ingram conclude that westerners from arid states as a group value water beyond its material worth and that cyclical droughts and water shortages motivate stakeholders to gain control of available supplies in order to secure water for future needs.[37] "This community value of water is particularly strong among many Indians and rural Hispanics" who perceive water as a symbolic resource beyond its material utility and ought to "assert their community values politically through elective and agency processes."[38]

But, how do state water officials and politicians evaluate the importance of community and other intangible values which cannot be accounted for in market efficiency terms? Should water policy mitigate impacts that threaten social cohesion, family support structures, or the ancestral farms of an endangered regional culture? Precedent for such controls exist in New Mexico. The rural villages of New Mexico historically have provided a "community safety net" to individuals and families in times of need. The extended family structure and the subsistence agro-pastoral economies many times have buffered downturns in the outside economy. Furthermore, the acequia association functions as a problem-solving and decision-making institution in the absence of any other public body in the immediate vicinity. For example, the annual cleaning of the community ditch not only marks the beginning of the agricultural season in early spring, it is also an occasion to address other local issues, reconfirming the sense of place, belonging, and the importance of traditions that undergird community life.

By any measure, it is clear that the resource base of land and water have knitted acequia communities together enabling them to provide mutual support and a system of reciprocal welfare assistance. For many generations, especially during and since the Great Depression of the 1930s, the family ranchos served as economic havens for young people who migrated out to the urban employment centers but, out of necessity, returned when jobs ran out, or when the regional mines closed down. The security of "el pais," [the homeland] as they call it, beckons their return from one economic cycle to another. In more modern times, often el rancho, mortgage free, is the only place where youth can expect to build affordable housing. Such support allows generation after generation to earn a livelihood by staying in or returning to the area.

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36. See F. LEE BROWN & HELEN M. INGRAM, WATER AND POVERTY IN THE SOUTHWEST (1987).

37. *Id.* at 28-29.

38. *Id.* at 29, 44.

The Protection of Keystone Communities

Another public policy challenge is to strengthen institutions that are already self-reliant. Should the state validate the importance of mutual aid organizations? Other values are better understood because they can be measured or quantified in economic terms, or because they can be regulated. But the cultural values and social aspects of water use are not as tidy. The constituencies are fragmented. They lack a power base and the technical staffs. The choice among competing values is not clear: instream flow to protect wildlife and to provide for urban recreational demands such as fishing and rafting? Acequia uses to preserve sustainable agriculture and a rural way of life? Or transfers of water to "higher values uses" for cities and high-tech industries?

These are difficult issues, but as concluded in a recent study of water rights transfers in the western states, New Mexico represents the most compelling case for recognition of social and water equity values:

> In the nineteenth century, Anglo property concepts were superimposed over the more communal traditions of the pueblos and Hispanic irrigation communities. Today New Mexico has a sophisticated water allocation system that basically treats water as a commodity to maximize the efficiency of use of the resource. But the clash of cultures makes northern New Mexico special; there are allocation tensions [here] that do not exist in other states. If one wanted to make a case for protecting communities as entities, northern New Mexico would be the example to use.[39]

Some precedents exist. Numerous times, governments (federal, state and local) have intervened in market arenas to preserve other natural resources and historic treasures: national forests, wildlife refuge preserves, wetlands and other animal sanctuaries, land trust territories, state open space parks and trails, historic main streets, town plazas and buildings.

Acequia villages and towns should challenge the state to accept the proposition that their communities perpetuate a unique rural culture important to the region and the state as a whole. These rural enclaves are the keystones to a way of life which should be protected from urban spill-over effects, commercial exploitation, and the pressures of economic conversion. Rapid economic and demographic change inevitably will hasten the displacement of an already endangered regional culture and the diversity of the rural landscape which the acequia agro-ecosystem preserves. As noted in more general terms by conservation biologist Reed F. Noss:

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39. NATIONAL RESEARCH COUNCIL, *supra* note 35, at 162, 175.

> The only success stories in real multiple-use conservation are a handful of indigenous peoples who have somehow been able to coexist with their environments for long periods without impoverishing them. Some indigenous cultures have even contributed to the biodiversity of their regions suggesting that humans have the potential to act as a keystone species in the most positive sense.[40]

Acequia communities act as the keystone species for ecologic habitats which support plant and wildlife biodiversity. Throughout north-central New Mexico, these communities provide the cultural setting which makes possible the thriving arts and crafts industry attractive to tourists. Water transfer out of the acequia over time could break links in the chain that holds the community together.[41] One water sale likely will lead to others, leaving fewer parciantes to maintain the ditches, raise funds for seasonal repairs, enforce and administer the rules, and keep up with the chores of organizational maintenance. A total collapse of the acequia institution would be catastrophic to the community as a whole. From this perspective, maintenance of village economies, lifestyles, and other "community characteristics" valuable to the state should be regarded as "public goods" worthy of legal or regulatory protection.[42]

Acequia Sustainable Development

Acequia associations constitute the oldest water management institution in New Mexico and probably in the entire United States. They have operated with a few basic rules based on customs and traditions, managing communal property resources with minimal government assistance. Government does not have to invest any public funds in creating new forms of democratic participation, maintaining organizational functions or subsidizing their activities. Acequia institutions have long ago proven their sustainability as conservation and management entities, features they share with other small scale irrigation organizations around the world: the subaks of Bali, the zanjeras of the Philippines, the

40. Reed F. Noss, *A Sustainable Forest is a Diverse and Natural Forest, in* CLEARCUT: THE TRAGEDY OF INDUSTRIAL FORESTRY 35, 37 (Bill DeVall ed., 1994).

41. Sylvia Rodriquez, *Land, Water, and Ethnic Identity in Taos, in* LAND, WATER, AND CULTURE 313, 356 (Charles L. Briggs & John R. Van Ness eds., 1987).

42. *See* Susan C. Nunn & Julie Urban, Equity: There is Always a Tradeoff 14 (Sept. 1989) (unpublished manuscript on file with *Natural Resources Journal*).

sociedades de riego in the Tehuacan Valley of central Mexico, and the huertas of Valencia, Spain.[43]

The government must protect the agro-ecosystem if the acequia institution is to function properly. General principles of watershed planning in most states already advocate the protection of ecosystem values such as aquatic resources and biological diversity. At the time of settlement, the watersheds in the upper Río Grande formed the basis of the community economy and its sustainability. As in other arid environments around the globe, water availability made settlement possible to start with-to remove it from the land base would be the death knell for the community. Arid conditions make for a very fragile ecology; in northern New Mexico, life and the settlement have been maintained through a delicate balance of controls, water conservation rotations, and stewardship of communal resources. This has been accomplished by a water institution that is democratic, wholly indigenous and a model of resource sustainability with global implications. To sever water resources from the land base would preclude the acequia members from maintaining their current communities and planning for development in the future.

As noted by Devon Peña in his studies of Hispano family farms in southern Colorado, the agro-pastoral villages of the upper Río Grande have been widely praised for a century or more as ingenious adaptations to the harsh climates associated with high altitude, arid lands environments.[44] "At the heart of these farm and ranch communities is the watershed commons," with the high mountain peaks providing "water, timber, pasture, medicinal plants, and wildlife for use in common by the villages."[45] According to Peña, these watersheds form the basis of local self-governance and political organization, a unique integration of self-government by hydrographic unit.[46] In 1890 the watershed commons captured the attention of John Wesley Powell:

> The people of the Southwest came originally, by way of Mexico, from Spain, where irrigation and the institutions necessary for its control had been developed from high antiquity, and these people well understood that their institutions must be adapted to their industries, and so they organized their settlements as pueblos, or "irrigating municipali-

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43. *See* OSTROM, *supra* note 4; BERKES, *supra* note 5; Scott Whiteford & Luis E. Henao, *Irrigacion Descentralizada, Desarrollo y Cambio Social*, 40 AMERICA INDIGENA 52, 57-72 (1980).

44. Devon Peña, Cultural Landscapes and Biodiversity: The Ethnoecology of an Upper Río Grande Watershed Commons, Address at the Ethnoecology and Biodiversity Laboratory Conference 1 (Apr. 7-8, 1995) (transcript on file with *Natural Resources Journal*).

45. *Id.*

46. *Id.*

> ties," by which the lands were held in severalty while the tenure of the waters and works were communal or municipal.[47]

Contemporary principles of rural environmental planning confirm that local resources should form the basis for guiding economic development and growth that is sustainable and consistent with resource base capacities: the natural, human and cultural elements of development which serve as the building blocks of any local economy. Conventional approaches to economic development in the rural West, based on mineral extraction, industrial relocation, and capital intensive tourism have met with dismal results. Jobs may be created, but the benefits are inequitably distributed. Growth may or may not occur, but poverty and underdevelopment persist, and in the process, the community loses control of the resources it needs for long-term sustainable economic activity.[48] Development that is integrated with local institutions and which conserves existing cultural resources is a more attractive alternative. "However, that possibility is foreclosed once water rights are lost to the rural areas, land use patterns are destroyed, and the acequias and other local institutions atrophy."[49]

Business ventures such as the training compound at the Pecos River Ranch do not extract natural resources in the conventional sense. In fact, part of their marketing strategy depends on rural preservation. PRLC lures customers from well outside the region by promoting the environmental resources and the aesthetic beauty of the local area, the blue skies, clean air, mountains, rivers, as well as the cultural attractions, such as the adobe architecture, the Indian and Hispanic arts and crafts, and other items associated with "the Santa Fe style." In the short run, the tourism infrastructure also produces jobs in the local economy, albeit at the lower end of the salary and wage scale. A single venture at a time might not amount to much harm, but a series of related industries, such as dude ranches, health resorts, world-class golf courses, second-home developments and luxury condominiums together and over time will trigger an irreversible process of water transfers from adjacent acequia communities.

A much publicized case occurred in Río Arriba County when District Court Judge Art Encinias denied an application that would have transferred water rights from the Ensenada Ditch to a proposed lake development project. Though reversed later by the New Mexico Court of

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47. John W. Powell, *Institutions for the Arid Lands*, 40 CENTURY 111, 112 (1890).

48. FREDERIC O. SARGENT ET AL., RURAL ENVIRONMENTAL PLANNING FOR SUSTAINABLE COMMUNITIES 7, 63 (1991).

49. David Benavides, Written Testimony for the State Engineer Task Force 4 (Feb. 28, 1994) (unpublished testimony on file at Northern N. M. Legal Svcs., Inc.).

Appeals,[50] Judge Encinias' ruling continues to be cited as a potent argument for the preservation of acequia-based culture:

> . . . the evidence discloses a distinct pattern of destruction of the local culture by development which begins with small, seemingly insignificant steps. I am persuaded that to transfer water rights, devoted for more than a century to agricultural purposes, in order to construct a playground for those who can pay is a poor trade indeed.[51]

Under a high water transfer scenario, the resource base which made business and tourism attraction possible would disappear. The open space pastures will lie fallow and village life itself could possibly wither away. Increased development will drive up property values. More and more water will be transferred to fill the spas and swimming pools of the rich. Condominiums, multifamily dwellings, gated luxury communities and other commercial subdivisions have already replaced parts of rural Santa Fe and Taos counties. Severing water rights from farmland for development purposes will erode the resource base that the acequia communities depend on. Because the tourism industry needs the rural and quaint village landscapes to sustain the attractions and amenities that tourists seek, elimination of acequia communities runs counter to tourism goals. The acequia communities, therefore, have economic arguments which support an assertion that a sustainable development policy is in the public interest. It promotes cultural tourism while supporting public welfare goals of self-reliance, anti-poverty, and grassroots democracy at work.

ACTION STRATEGIES AND LOCAL INITIATIVES

The state legislature could enact a number of possible water law reforms. However, acequia users should not depend solely on legislative proposals which may or may not be enacted. The communities themselves are in a better position to demonstrate by direct action the cultural and social importance of water to community survival and continuance. The preceding evaluation of the community value of water is more evident to acequia members than it is to those who do not share a common cultural background. Acequia communities are in the best position to educate other segments of the public, including decision-makers. Often this is done through testimony by acequia members, expert

50. *In re* Application of Sleeper, 760 P.2d 787 (N.M. Ct. App. 1988), *cert. quashed*, Enseñada Land & Water Ass'n v. Sleeper, 759 P.2d 200 (N.M. 1988).

51. *In re* Sleeper, Rio Arriba County Cause No. RA 84-53 (c).

witness testimony or opinion surveys produced while a legal dispute is pending, methods which tend to be reactive in nature.

There are a number of pro-active strategies and initiatives which acequia communities should consider as mechanisms for expressing public welfare at the local level where they have direct access to decisionmakers. Actions taken prior to a dispute that illustrate the community value of water provide a legacy of support for the community's position in the dispute. Furthermore, the process of taking these actions becomes educational for those participants who are unfamiliar with the importance of acequias.

The Historic and Cultural Preservation Strategy

The PRLC case study illustrates how historic and cultural preservation strategies can keep water rights within the community. PRLC's efforts had threatened the traditional water rights, not just from any acequia on any stream, but those of one of the most significant and still-functioning community land grants in the region. As has been the practice for many generations, the Anton Chico Land Grant Board regulates land use and land tenure, and thus preserves and maintains land based culture on that section of the upper Pecos River.

In 1985 state and local initiatives were started to designate the area as a historic district in order to protect "one of best preserved Hispanic land grant communities in New Mexico" representing 19th century farming and ranching in the region and regional folk architectural types.[52] The historic designation was eventually approved and provides an important spatial boundary that locates a specific human settlement deserving of protection from external pressures of change. The lever is somewhat akin to environmental safeguards to protect the habitats of endangered species. The land grant is a unique cultural treasure, and its placement on the national historic register helps to validate that claim.

Not all acequia communities retained their original land grant status. Nevertheless, every rural village in the region has a link to the past which shapes its present day identity and character. Protection of these sites, landscapes or historic properties, including the acequia watercourse as a commons property, is important. Water officials must understand the need to sustain the livelihoods of people who make up a unique community. In many instances, historic and cultural preservation projects, when completed, actually improve the economic value of

52. STATE HISTORIC PRESERVATION OFFICE, ANTON CHICO HISTORIC DISTRICT, STATE REGISTER NO. 541 at 18.

a town and the surrounding region. The drive to achieve historic designation, however, must begin at the local level.

The Political Subdivision Strategy

The 1985 state statute on water conservation and public welfare does not provide concrete guidance in terms of defining the "public welfare." From one viewpoint, the vagueness in the law allows the acequia community an opportunity to define "public welfare" in its own terms. Acequia communities, through their ditch irrigation organizations, hold a special and unique status as public entities. They can assert their role as political subdivisions of the state of New Mexico and protest water rights transfers not only as parties who will be impaired but also as public instrumentalities of the state that "have standing to file objections or protests" for others.[53]

Acequia associations should be aware of and exercise their unique status as public entities. If asserted, this status gives them automatic standing on public welfare grounds.[54] To take advantage of the special status to comment on public welfare, acequia leaders who object to proposed transfers would be well-advised to submit a formal and timely protest in the name of the acequia itself. In addition, protestant comments should be obtained from county level governments and other public entities concerned with water and natural resources conservation.

In the case of the Pecos River Learning Center application, the Guadalupe County Board of Commissioners went on record against the transfer of water rights out of the area. In a resolution passed on July 15, 1994, the County Board of Commissioners offered to assist the Office of the State Engineer in determining whether water right transfers out of the local communities are detrimental to the public welfare. Their own conclusions were clear and could not have been more supportive. They

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53. N.M. STAT. ANN. § 72-5-5(B) (Michie Repl. Pamp. 1985).

54. 63 Attorney General Opinion 63-112. At least two attorney general opinions since statehood have considered the question of whether community ditches are political subdivisions of the state of New Mexico. In 1940, the attorney general noted that the ditches had functioned for hundreds of years as rural water systems providing benefits to farmers similar to those that municipal water works provide to city dwellers, "both being of a benefit to the public and a necessity for the maintenance of health and life by the distribution of a publicly owned commodity, to-wit: water." Later in 1963, the attorney general was asked for a ruling on the specific question: are acequia association ditches political subdivisions? His reply was unequivocal: "Most certainly. . . . It is no exaggeration to state that community acequias have been serving as 'political subdivisions' in the area that now comprises the State of New Mexico since at least 1851." Report of the Attorney General, No. 63-112, at 247-252.

found that: the transfers are detrimental; the irrigation systems have historical and cultural value; acequias form the economic base of the community, and water right transfers away from the county threaten the resources that provide economic and non-economic benefits to the public.[55]

Rural Conservation Programs

Rural conservation programs offer more comprehensive strategies with a wide array of concrete action steps that acequia communities can consider. A guidebook by the National Trust for Historic Preservation, for example, highlights rural conservation programs from twenty-eight different communities throughout America that took action to enhance the environment and the economic values of their towns and regions.[56] The guidebook features many preservation issues also important in the uplands region of northcentral New Mexico: rural land use, historic sites and places, cultural resources and economic development, natural areas resources, critical area zoning, river corridors, and community property trusts.

Rural Land Use

While acequia communities hold the status of political subdivisions, they do not have powers to regulate land use. Unincorporated acequia communities should work with county governments toward the adoption of a wide variety of supporting planning tools. For example, Río Arriba County amended subdivision regulations to control development when it threatens irrigated farmland and water quality. In cases where subdivisions of farmlands are approved for conversion to other uses, rural counties could impose a development impact fee in order to replace the lost acreages. Acquiring equivalent farmland elsewhere in the county would internalize the impact. Acequia communities should participate in efforts to prevent farmland from being converted to other uses or from being abandoned. Their continued participation in the ongoing regional water planning process of the state is critical.

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55. Guadalupe County, N.M., Resolution No. 07-94-14 (July 15, 1994).

56. *See* SAMUEL N. STOKES ET AL., SAVING AMERICA'S COUNTRYSIDE: A GUIDE TO RURAL CONSERVATION (1989).

Historic Sites and Places

Each acequia community should identify features or characteristics which best define the community as a place or that represent its very identity. What is valued locally? Links with the past can help to galvanize support when a community's future is threatened. In the case of Anton Chico, the water users are not simply trying to retain resources for the sake of nostalgia. Water resources are the fundamental life support systems of the land grant that make "community" possible today and for their heirs. Agro-pastoral economies depend on the integration of water-dependent farmlands and adjacent open space in the land grant commons for livestock raising. Anton Chico residents took an important first step when they supported efforts to designate the land grant area as an historic district. Acequia communities not connected to a land grant can nevertheless seek historic designation of the communal properties found in all of these communities: the ditch watercourse system built by the initial settlers; and the watershed source at the high mountain sierra peaks, headwaters for the downstream acequias.

Cultural Resources and Economic Development

Again, the acequia communities of New Mexico are not limited to protecting museum artifacts or other folklife traditions lost to history. They may also protect ongoing items of material culture which continue to be produced from everyday life experiences. These current cultural items, along with the revival of older forms and artifacts of culture, are economic assets. The cultural landscape is part and parcel of the infrastructure that supports the tourism trade in New Mexico-and, it is renewable. In weaving, for example, the Río Grande and Chimayo traditional designs survive; but artistic experimentation, especially by the newer generation of weavers, creates new mixtures, blending the old with the new. These new forms would not be possible without the element of contemporary community life and the ability to transfer knowledge and techniques into succeeding generations.

The acequia communities already form part of the economic development infrastructure of the state in terms of the huge tourism industry which showcases the quaint village adobe architecture, the farmers' markets in Santa Fe and other nearby cities, the lush greenbelts and orchards which define the landscapes of the river valleys, and very importantly, the cultural production renowned as "northern New Mexico village arts and crafts." The santos, retablos, colonial wood furniture, the folk art, tinworks, jewelry, hand woven rugs, and other New Mexican products are marketed worldwide. These coveted objects are inextricably

connected to and cannot be replicated outside of the cultural environment from which they arise.

Natural Area Resources

The resource base is essential to survival of the acequia communities, yet very little documentation exists about which natural areas are the most crucial to the community. It may not be enough for acequia officials to say that the natural environment is important. However, with some technical assistance from university and state agency personnel, the water users could identify, inventory, and map the specific resources in their own areas that they believe should be protected. As a second step, communities need to form active partnerships at the implementation stages with county government, not-for-profit organizations and preservation foundations to prevent development from destroying valued natural areas.

Critical Area Zoning

Sensitive natural areas may require strong enforcement tools such as zoning. To protect the area most critical to acequia family farmers, the Costilla County Board of Commissioners in the San Luis Valley of Colorado adopted a resolution during the summer of 1995. The resolution protects watersheds above 8,000 feet elevations against adverse land use impacts of development. The county action seeks to protect forest canopies such as the privately owned Sierra Mountain Tract, the originating water source for the San Luis ditches in the bottomlands.[57] In most other locations throughout the upper Río Grande region, these high mountain peaks are in public ownership. Perhaps such publicly owned forest canopies should be identified in natural area maps as watershed commons property critical to sustaining the agro-pastoral economy downstream from the headwaters source.

River and Acequia Corridors

River corridor projects have been successful elsewhere, including New Mexico. In the upper Río Pecos and other acequia communities, corridor projects could be expanded to include the acequia waterways. Scientific field inventories have established that acequia watercourses function as biological and wildlife corridors. They preserve the local

57. Costilla County, CO, Resolution Designating Watershed Protection, No. 95-100 (June 23, 1995).

biodiversity and greenbelt habitats which in turn nourish native species of willows, cottonwoods, capulin [chokecherry] and cirguela [native plum] tree shrubs, and the wildlife. Earthen ditches leak water into the land around them maintaining trees and shrubs with extensive root systems and other perennial vegetation, meanwhile creating wildlife habitats.[58] Corridor projects, perhaps under state sponsorship, can help educate the public about the ecologic values of acequia irrigation practices.

Community Property Trusts

Several management mechanisms protect community property trusts. Acequia communities which are not attached to a land grant can form community land trusts as mechanisms to acquire irrigated farmland when local owners opt to sell. This approach retains the water rights on the original parcel of land for resale. Land grants presumably have this power to acquire new properties under their existing charters. With respect to water pooling, acequia associations under state law can function as both a community water trust and a revolving fund manager. Most acequia officials are unaware of these techniques or their full potential. Associations can own water rights, pool them, lease them, and sell them. Acequia associations should study the land trust and land revolving fund models and apply the concepts to water rights banking. An internal program to retain water rights in the community will serve as direct evidence of the importance of water to the land base when acequia users protest applications that seek to transfer water rights to other uses or destinations.

In addition, water trusts or banks can be designed to retain local control over agricultural lands temporarily or permanently out-of-service. The Middle Rio Grande Conservancy District (MRGCD), for example, plans to establish a water bank which will purchase water rights when irrigated farmland is subdivided into other uses or lease them when farmers opt not to forfeit water rights during temporary periods of non-use.[59] Consistent with its name, the MRGCD water bank will accumulate water rights as its working capital; recorded in a bank ledger, water rights will be regarded as bank assets that can be deposited and withdrawn. For a fee, consumers will be able to borrow water rights on deposit by submitting a loan request stipulating the amount of water

58. Devon G. Peña, GAIA in AZTLAN: CULTURE, ECOLOGY, AND POLITICS OF LOCALITY IN THE UPPER RIO GRANDE WATERSHED 32 (1994) (unpublished manuscript on file with *Natural Resources Journal*).

59. *The Bulletin Board*, DIALOGUE, Oct. 1995, at 22, 23.

requested, its intended beneficial use, the place where water will be diverted and also used, and the duration of the water use.[60]

Through a water trust, acequia associations can pool surplus water rights in the community, avoiding forfeiture, and then lease them back out either to open new irrigated lands or reinstate water rights on farmlands which perhaps have lost them. State legislation in 1991 exempted water conservation and preservation programs from the forfeiture provisions of the Surface Water Code, an additional instrument that will make water trusts even more feasible in the future.[61]

CONCLUSIONS

The action strategies and initiatives above are presented as suggestions for further study and should be taken as preliminary ideas that can be modified to suit local circumstance. Also, a number of them cannot be accomplished in New Mexico without enabling legislation at the state level or new land use and subdivision regulations enacted by county governments. This article closes with three state initiatives that can begin a review of possible legislative proposals, water law reforms, and other changes in statutes: 1) water laws to allow the designation of riparian corridors; 2) state and county legislative initiatives to encourage rural water conservation programs and; 3) the enactment of an acequia community preservation law.

Water Law Reform: Riparian Corridors

State water law should be amended to allow the designation of "regional water resources conservation and historic zones." The purpose of this law would be to recognize the historic importance of river corridors in areas of the state which have sustained human settlements founded on principles of natural cycles and regenerative agriculture. Under such a law, stretches of rivers anywhere in New Mexico which meet this basic criteria would be declared state historic treasures. With respect to water right use, only historic domestic, livestock, wildlife and agricultural uses would be permitted in these zones. Transfers to other uses or to areas outside the river corridor zone would not be approved by the State Engineer. Lastly, in these zones only, water would run with the land in perpetuity and could not be severed or transferred to other uses or to other locations. This provision would not prevent water right

60. Middle Rio Grande Conservancy District, Policies and Procedures, Rule 23, (Oct. 9, 1995).

61. N.M. STAT. ANN. § 72-12-8(D) (Michie Repl. Pamp. 1985 & Cum. Supp. 1996).

owners from selling altogether; they would be able to sell the land along with the water rights.

The preservation of historic riparian corridors can be compared to the state statute which protects the middle Río Grande bosque and its unique strand of cottonwoods in the Albuquerque metropolitan area. The idea is to designate conditions, or special areas at the micro-watershed level which are ecologically and culturally fragile, under which water cannot be severed from the land. Acequia community micro-watersheds are as much part of the state's heritage as are bosque cottonwoods.

Rural Water Conservation Programs

County governments and acequia associations may need new laws and regulations to develop rural water conservation programs such as critical areas overlay zones and to provide funding for farmland preservation. In addition, New Mexico does not yet have a minimum instream flow statute as exists in other states, despite the annual fluctuations in precipitation and stream flows. A minimum instream flow statute could be enacted for certain applications. For example, transfer applications that propose to retire surface irrigation water from community ditches in order to pump an equivalent amount of ground water would be denied in streams such as those on the Pecos River that are subject to intermittent or no flows in years of drought.

The objective here would be to permit the natural hydrologic cycle to determine stream flow and to prohibit any interventions that would exacerbate drought. To protect acequia users' priority rights, an instream flow statute could assign junior rights to instream flow water based on the date of the statute. The proposed statute should state clearly that water cannot be severed if adjacent to watercourses, including community ditches, that require minimum flows to support scenic greenbelts, agricultural fields, plant and animal habitats, and other life forms that depend on a consistent supply of water. Where allowed, the pumping of groundwater for upstream development could be taxed in order to create a public fund for the purchase of other water rights needed to replenish flows into the river. As an additional protection, watershed sources at the sierra peaks should be designated as critical area zones, prohibiting adverse impacts from development or other land use projects such as timber harvesting and road clearings which reduce the forest canopy needed to retain winter snow.

Acequia Community Preservation Act

The state legislature should also consider adopting a specific measure that would ensure the continuation of acequia communities

which are essential to the state's economy and cultural diversity. An "Acequia Community Preservation Act" should be adopted that would establish historic and cultural zones that protect acequia communities from water right transfers out of the community. These communities predate Anglo settlement and statehood by hundreds of years. From an historical perspective, the state water code (1905) is a relatively new invention, enacted some three hundred years after original settlement of the region by the Spanish crown. Similar to the proposed reforms in item one above, this statute would prohibit water right transfers out of the water-dependent communities. This statute would not require a wholesale change from a prior appropriation to a hybrid riparian state. Instead, existing New Mexico water laws would be amended to prohibit water right transfers outside of an acequia community zone but still allow them within the designated zone.

The intent of the legislation in this case would be to insulate the acequia communities from the pressures of the water markets which are certain to intensify. For the first time, state water law would explicitly recognize social, historic and cultural values in the allocation of water rights and water use, protecting the rights of historic and traditional water users to maintain and sustain their way of life. As an implementation tool, the Acequia Community Preservation Act could authorize a compensatory program, perhaps through severance tax bonds, to create a public fund for the purchase of water rights within any of the designated zones. Landowners would be compensated for any water rights they voluntarily choose to transfer to the local acequia association or its water trust.

Voluntary and otherwise market-based water transfers may be the most politically feasible, economically efficient and administrative operable strategies when compared with the more controversial approaches inherent in regulatory programs that often raise constitutional issues of uncompensated taking.[62] Models on how to finance water purchases with public funds already exist as precedents. For example, the federal government levies fees on transactions which transfer Central Valley Project water in California from agricultural to urban uses, thus creating a "restoration fund" which the Secretary of Interior can then use to augment California's aquatic biodiversity.[63] In the years and decades ahead, acequia water rights in the upper Río Grande will continue as the most vulnerable to the pressures of the market as it seeks to transfer water from the lower yields to more profitable uses. Taxing each of these

62. Gregory A. Thomas, *Conserving Aquatic Biodiversity: A Critical Comparison of Legal Tools for Augmenting Stream Flows in California*, 15 STAN. ENVTL. L.J. 3, 45-47 (1996).

63. *Id.* at 51.

and other agricultural water transfers seems to be an equitable remedy, providing the state with a fund to purchase water rights for reallocation to acequia zones most impacted by losses or the most endangered by encroachment.

A Final Note

The watercourse has always been a vital part of the acequia community ecosystem. New Mexico policymakers need to look for ways to define, map, and protect the boundaries of the watercourse greenbelt, to include not just the river and adjacent *bosques*, but also the acequias traversing the foothills, the vegetated ditch banks, and the irrigated bottomlands. The watercourse is the most distinguishing feature of the typical acequia community and its relationship to the surrounding open and rural landscape: it shapes the edges of the varied terrain; it defines the natural and human-made boundaries; its sets the limits to growth; it allocates space for community development and the built environment; and it nourishes the plant and animal ecologic life within the corridor.

In the end, the most compelling argument that can be made is that the acequia as an institution perpetuates continuity, a sense of place, and a system of direct democracy which provides for the stewardship of a life sustaining resource. In turn the acequia communities as a whole provide for spatial balance in the bioregion. These keystone villages form a network of settlements that depend on, and therefore protect, the watershed resource base for other stakeholders, including the larger cities, the high-tech industries, and the vital tourism economy of the state. The ribbon-like corridors and acequia fields in the state act like a wetland system. The valley bottomlands and acequia watercourses are sponges which retain water, control soil erosion, recharge the aquifers, nurture the cottonwood forests and other native vegetation, shelter the wildlife and fish habitats by maintaining instream flows, all the while preserving historic cultures and contributing to global diversity.