

Paso del Norte Sustainable Water Use Strategy

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ABSTRACT

The University of Texas at El Paso's Center for Environmental Resource Management (CERM) acted as the lead entity in an ambitious effort to reconcile rapid urban growth with the limited water resources of a region consisting of west Texas, southern New Mexico, and northern Chihuahua (Mexico). As regional ground water supplies diminish, municipal and industrial interests are beginning to turn to the surface waters of the Rio Grande, placing urban and agricultural uses in conflict. The legal framework that governs the allocation of surface water does not readily allow for non-agricultural use, nor does it provide incentive to agricultural interests to conserve water. A lengthy public involvement process was used to develop a comprehensive strategy to encourage wise water use policies, recognize ecological needs of the riverine environment, respect agricultural interests, promote enhancements in the region's quality of life, and allow for continued economic growth by emphasizing businesses with minimal water needs. Efforts to implement the priority recommendations of this strategy statement are on going.

INTRODUCTION

In April of 1996, the University of Texas at El Paso's Center for Environmental Resource Management embarked on an ambitious project to create an economic development strategy for the Paso del Norte region based on the sustainable use of the region's water resources. The Economic Development Administration underwrote the study with support from the Ford Foundation and participating universities. A series of technical studies were commissioned as part of this study, and a yearlong public participation process was undertaken in 1997. The result of this effort was a detailed strategy statement published under the name *Paso del Norte Sustainable Water Use Strategy* in October of 1998. Following is an overview of the strategy statement recommendations and a description of the process used to create it. This case history is provided, as the lessons learned from the experience may have applicability in other processes that involve competing interests for limited natural resources.

The Setting

The Paso del Norte region, as defined for the purpose of the project, consists of the five westernmost counties in Texas, two counties in southern New Mexico that lie along the Rio Grande, and four municipios in Chihuahua that

border the Rio Grande down to its confluence with the Rio Conchos. The region falls within the arid Chihuahuan desert, an area that averages less than 220 millimeters of rain annually. Fed by snowmelt from the Rocky Mountains far to the north, the Rio Grande both defines and bisects the region. While most of the region is sparsely populated, intensive irrigation of the Rio Grande floodplain made possible the rise of cities in the region. Ironically, today, urban growth is displacing agriculture as the El Paso / Cd. Juárez / Las Cruces area is becoming a major urban agglomeration with a combined population exceeding two million (El Paso Planning Department, 1997; IMIP, 1997; Las Cruces Planning Department, 1993). The burgeoning population is straining the region's limited water resources.

Historically, the urban areas exploited high quality ground water while the region's farmers relied on the surface waters of the Rio Grande, managed downstream of Elephant Butte Dam in southern New Mexico by a complex system of international treaties and interstate compacts. Over time, over-drafting lowered the water tables of the region's aquifers; a trend that continues and is accelerating as municipal and industrial water consumption increase in conjunction with the region's rapid population growth. Conflicts are developing over access to the remaining aquifers. Coordinated resource management planning is made difficult by the multiple jurisdictions and significant differences in the laws of the three states and two nations.

Due to diminishing ground water supplies, the region's cities are planning to shift, or already have begun to shift, to using surface water. Increased municipal use of surface water will come at the expense of agricultural use. This shift will diminish the agricultural sector of the region's economy and alter the physical environment of the Rio Grande floodplain. Additionally, a transition from agricultural to municipal use of water will require modifications to the legal rules that govern water allocation. If existing water rights holders are not fairly compensated, a legal conflict may ensue that could forestall the transition to municipal use of surface water use and hasten the depletion of the region's aquifers. Inevitably, as municipalities shift to using surface water and lesser quality ground water, costs of water treatment will increase, water rates will rise, and this cost escalation will have economic consequences. While municipal/industrial demands for water may inevitably bring about the demise of agriculture in the region, the transition could be made less disruptive if concurrent incentives were put in place to promote agricultural water conservation.

Ironically, even as municipalities are turning to surface water, some ground water is being used for agricultural

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purposes. Cd. Juárez does not have a wastewater treatment plant. Untreated water, carried downstream via open ditches, is used by farmers for irrigation purposes. Because of high levels of total dissolved solids (TDS) and because of the presence of anthropogenic chemicals, the wastewater is blended with better quality ground water. In the northern portion of the region, some New Mexico landowners have initiated pecan orchards along the desert foothills adjacent to the river floodplain, and use pumped ground water for irrigation. One of the incentives for this action is to document a beneficial use of ground water and thereby vest a water right – an important property right in a region where water is diminishing in supply and increasing in value. Unfortunately, the irrigation of properties in the desert fringes of the floodplain generates relatively saline return flows, thus contributing to degradation in water quality. The combination of low flow volumes (having an annual variance from 14 to 100 cubic meters per second) and intensive irrigation, result in increasingly higher levels of TDS. Downstream of El Paso, the Rio Grande is brackish (exceeding 1,000 mg/liter). (Turner, 1998)

The Process

The process of developing a sustainable water use strategy employed a series of steps:

- Technical studies to document the region's water problems and potential courses of action;
- An outreach component whereby a broad-based group of stakeholders was assembled;
- Division of the overall stakeholder group into several sub-groups based on different subject areas;
- A series of meetings with the sub-groups to articulate goals and objectives, and to solicit recommendations for actions; and,
- Meetings of the overall stakeholder group to review, discuss and prioritize the recommendations.

The sustainable water use strategy for the Paso del Norte region was intended to be both technically possible and politically practical. For that reason, it had two components: a research component and an outreach component. The former was necessary to develop a factual basis for subsequent discussions of appropriate water resource management; the latter was necessary to solicit input from the diverse spectrum of interests affected by water policies in the region. Water policy is not simply an outcome of objective analyses of quantifiable data. Rather, systems of water allocation evolve over time in response to the dynamic interaction of political, social and economic forces. This evolution cannot be rapid because many elements of the economy rely on having a secure and certain access to water, and changes in water policy are apt to have repercussions on many actors. Suggestions of change that may have negative consequences to a given actor are likely to be met with fierce opposition. Thus, it was imperative that our process allow for an open dialogue among competing interests. The staff endeavored to make the decision-making process "transparent", meaning that all participants would understand who was making decisions, and both how and when the decisions were being made.

The technical component of the project was begun with the letting of contracts for a series of technical studies. The pattern of existing water use was documented both for agricultural and municipal use, and municipal use was further broken down into residential and non-residential categories. The relationship of water use to the regional economy was documented in terms of both employment and payroll by economic sector. The overall population within the region was projected to the year 2050 based on the separate projections of the different jurisdictions in the region. An analysis was made of the types of water treatment technologies that may be necessary as the region becomes reliant on lower-quality water resources. A water exchange system was postulated to determine the benefits and potential negative impacts from a market-driven reallocation of surface water. Together with funding from other sources, a computer simulation model that coupled ground water and surface flow was created to facilitate an analysis of the environmental impact of altered stream flow regimes proposed to supply a year-round source of surface water to the region's municipalities. And finally, a report was prepared to document the legal rules controlling the allocation and use of both surface and ground water, together with an assessment of how the existing system might be adapted to enable the development of a long-term strategy for sustainable water use.

The outreach component was initiated early in 1997 by sending letters to approximately 30 individuals inviting them to attend an organizing meeting. These individuals were chosen to represent public water utilities, irrigation districts, economic development specialists, and environmental organizations. Care was taken to ensure a balanced representation from the states of Chihuahua, New Mexico and Texas. Consultants that had been hired to prepare technical studies were charged with presenting their preliminary findings; this provided a pretext for the meeting and piqued the interest of the invitees.

At the end of the meeting, a committee structure was proposed and attendees were asked to volunteer to serve on the different committees. After some discussion, attendees suggested a slightly modified breakdown of committees. The staff quickly acquiesced to the group's wishes, thereby demonstrating a willingness to accept input, and providing the meeting participants with an initial sense of "ownership" in the process. The five working committees of the Taskforce were as follows:

- water resources
- environmental issues
- agricultural issues
- quality of life
- economic development

The group came to be known as the *Stakeholder Taskforce*. Attendees at the initial Taskforce meeting and at each meeting thereafter were encouraged to suggest names of additional invitees. The members did so and, over time, the Taskforce mailing list grew to nearly 200 names. Not all invitees participated, but no names were ever removed from the list. By this means, the process was as inclusive as possible.

The Stakeholder Taskforce committees met numerous times during which a draft version of the strategy statement was created. The draft statement was published in an Internet web site and presented and discussed in two broadly publicized public gatherings that were dubbed *Water Congress* meetings. The meetings were used to refine the statements of proposed actions and to determine those actions that have the most importance.

The Structure

The input from the Stakeholder Taskforce provided the substance of the strategy statement, however, it lacked structure. During committee meetings, individuals would sometimes propose courses of action that presupposed that others understood the nature of the problem that was meant to be addressed. Other times, individuals would voice opinions that defined a problem, but would do so in a manner that was little more than an expression of frustration over the seeming intractable nature of the problem. The staff was presented with the challenge of organizing the input of the Taskforce to link issues with actions, and to articulate objectives with policy responses. Creating the structure both allowed and required that the staff articulate ideas that often could only be inferred from the raw input of the Taskforce meetings. While this left open the possibility that ideas could be misconstrued, Taskforce members were never shy of offering comments and corrections, both because they were jealous of their ideas and because they were interested in the process. Over time, as the staff demonstrated respect for the integrity of the concepts put forward by the Taskforce, Taskforce members were comfortable in allowing the staff to exercise license in drafting specific language for recommendations.

The overall strategy statement was divided into five topics based on the five Taskforce committees. A general problem statement was developed for each of the five topics, accompanied by a broadly worded goals' statement. This provided an opportunity to clearly state any assumptions that were being made, and to provide a vision of a desired end state without becoming enmeshed in the details of how this was to be achieved. This served as an introduction to more discrete categories that were nested within the five topics.

Each of the detailed categories was further subdivided into issues, objectives, proposed policies and recommended actions. The issues were deliberately narrow; and the objectives were specific and short-range in their focus. Recommendations were divided into policies and actions to distinguish the principles that should guide future decisions from specific actions that should be taken.

The Recommendations

The full text of the strategy statement has 42 different proposed policies and 124 different proposed actions. The 16 highest priority actions, as identified by the Stakeholder Taskforce, were as follows:

1. Inventory the Extent of Regional Aquifers: Some of the ground water resources in the Paso del Norte region are very well documented, but others are only approximately known. This is particularly true for aquifers that overlap political jurisdictions and for the brackish and saline fractions of aquifers. Determining the quantity and quality of all ground water resources in the region was deemed the single most important action required to guide economic planning decisions.
2. Promote the Use of Treated Effluent: Treated effluent represents a water resource that can be used for non-potable purposes. Utilities should analyze the potential for reuse of treated wastewater and should use incentives to promote the use of treated wastewater. Land use planning should be mindful of this reuse potential by siting water-using industries, golf courses and green spaces near wastewater treatment facilities.
3. Resolve Disputes over Ownership of Water Rights: The ownership of water rights should be unequivocally established so that transfer of water between uses can occur in an orderly manner. Parties involved in a current legal dispute should strive to reach an equitable, workable resolution, and to develop an on-going process that enables proactive, non-litigious problem solving for resolving future disputes between the parties.
4. Mandate Water Conservation: Water conservation measures, clearly explained and consistently enforced, should be made mandatory for all entities. Water conservation should be promoted through an appropriate combination of regulatory and incentive-based approaches.
5. Drought Management Planning: A region-wide drought management plan should be created incorporating the needs of municipal, industrial, agricultural, and environmental uses. Drought management planning should be undertaken on a tri-state, bi-national basis by the region's utilities, irrigation districts and federal and state entities responsible for water management within the Rio Grande Project region.
6. Public Education: Educate the public about the importance of water conservation through various means including media campaigns, school curriculum development and native plant sales. The goal of the educational effort is to deepen the public's understanding for the need for conservation and to highlight actions that individuals can take.
7. "Borrow" Irrigation Water: In some situations, surface water can be provided for industrial and municipal use by "borrowing" irrigation water for drinking water use, then "paying back" the water in treated wastewater effluent for downstream agricultural users. This concept is particularly relevant to Cd. Juárez as part of its planning for future use of surface water for municipal and industrial use.
8. Regional Bi-national Planning: Enhanced international water planning and management is needed to facilitate the exchange of data and address water quality concerns. This could be accomplished through an expansion of the scope of responsibility of the International Boundary and Water Commission / Comisión Internacional de Límites y Aguas (IBWC /

CILA), or through the creation of a new bi-national under the auspices of the La Paz Agreement.

9. Biological Inventory: A comprehensive inventory of the river ecosystem should be prepared to identify existing biological habitats and identify sensitive biological areas along the Rio Grande/Rio Bravo. This assessment can serve as a baseline for the evaluation of future development proposals and for the development of a plan to enhance the river ecosystem.
10. Sale of Agricultural Water: Legislative changes are needed to enable farmers to sell off unused portions of their water allotment without losing the right to that allotment. This will enable the reallocation of water to municipal use while promoting agriculture based on types of crops and improved irrigation techniques that make efficient use of the remaining water.
11. Extend Water to Un-served Areas: Water, sufficient in quantity and quality for basic human needs, must be supplied to un-served neighborhoods huddled at the fringes of the urban areas. Water might be provided through the extension of municipal water lines, regulation of water-haulers, or other means. Planned, orderly extension of water utility services should be coupled with growth management strategies.
12. Rate Structures: The “real cost” of water should be reflected in water rate structures by factoring in the costs of exploration, treatment, delivery, future depletion allowances and quality of life and environmental issues. Rate structures should be based on long-term sustainable use.
13. Regional Planning and Management: A unified region-wide water management and planning mechanism should be developed to coordinate water policy in the region. The bi-state New Mexico / Texas Water Commission has begun to assume this role, but its membership should be expanded to include the Juárez Junta Municipal de Agua y Saneamiento. Planning activities should consistently solicit input from interested parties.
14. Analyze the Impact of New Development: Planning agencies and utilities should collaboratively analyze the impact of regional development and growth patterns on water supply and delivery capabilities. Development control strategies should be formulated to minimize per capita water demand and to ensure an orderly development of water supply infrastructure.
15. Coordinate Water Service Providers: A formal, permanent dialogue should be established between providers of municipal and industrial water within the region by the creation of a bi-national Water Supply Advisory Council. The Council would facilitate information sharing between regional municipal water providers so that they can develop joint ventures and work cooperatively to solve shared problems.
16. Promote Xeriscaping: The use of native and desert adapted drought-tolerant plant species in landscaping should be encouraged through tax and monetary incentives. State agricultural extension service agencies

should take a lead role by assembling a consortium of entities to develop a marketing and education plan to promote xeriscaping.

The Aftermath

Assembling a diverse group to discuss a subject as controversial as water policy was made possible in part because the Center for Environmental Resource Management (CERM) was a research arm of the University, and thus did not have a vested interest in any given system of water allocation. Using a portion of the grant funding to commission studies from some of the key actors had the effect of co-opting them and ensuring their participation. It was especially important that technical studies were commissioned from professionals from all three in major jurisdictions in the region. Once the key actors became involved in the process, participation broadened quickly as other entities wanted to be assured their points of view were reflected.

The strategy statement that emerged from the discussions of the Stakeholder Taskforce reflected the diverse viewpoints of the Taskforce membership. No pretense was made at reconciling differences of opinion, nor did the Strategy Statement purport to be a consensus document. Consequently, the final strategy statement fell short of the goal of an integrated plan for reconciling development pressures with sustainable water use. However, although differences in opinion were not resolved, that need not be viewed as a weakness in the document. If the strategy statement was to accurately reflect community attitudes, it had to fairly capture the range of opinion. More important than the conflicting points of view were the elements that received broad support. Therein lie the consensus elements from which a plan of action can be devised.

Ultimately, the measure of the success of any planning venture is the difference that it makes over time. As such, a planning document is not an end product, but a step in a continuing process. Certainly, the discussions among divergent actors helped to forge a sense of a shared destiny and a recognition of a mutual self-interest regarding the region's water problems, but by itself that cannot be considered a significant outcome. The challenge that lies ahead is how to pursue implementation of the key recommendations of use the strategy statement and, perhaps more importantly, how best to take advantage of the network of professionals that were brought together in the process of creating the strategy.

The number and diversity of the strategy statement recommendations made it difficult to focus the efforts of staff or volunteers on any one course of action. Rather than attempt to pursue all the recommended actions, an initial winnowing process was the designation of certain actions as having priority. Prioritization was accomplished through a voting process of the assembled Stakeholder Taskforce. While the sixteen recommendations noted previously were deemed to have the greatest importance, this still left too great a number of diverse actions to serve as a basis for continuing the process. A second reduction was accomplished by separating those recommendations that

were already being undertaken from those recommendations that that were not being pursued. For example, there is an on-going effort to characterize the extent of two of the principal aquifers in the region, (NMWRRI, TWDB, 1997). While it is noteworthy that this activity was deemed to have the greatest importance, funding is already committed for this purpose.

Among the several priority recommendations, one activity was clearly different from the others, namely that of developing a unified region-wide water management and planning mechanism. No existing entity has sufficient legal jurisdiction to pursue this end. Thus, if region-wide planning is to be undertaken, it may require either creating a new entity or expanding the mandate of an existing one. Tackling this recommendation is going to be very ambitious. Developing a fair, rational system for the sustainable use of the region's water resources ultimately hinges on changing the legal framework that governs water use. This could imply new legislation, interstate negotiation and even international treaty changes.

Pursing the implementation of the priority actions identified in the strategy statement requires an on-going commitment. Many of the participants in the development of the strategy are continuing to meet and work cooperatively to realize the strategy statement's ambitious proposals.

Implementation Update

Two years have passed since this paper was originally written. Many of the recommended actions are being implemented by local agencies. The U.S. Geologic Survey has thoroughly studied and modeled one of the region's primary international aquifers; but a similar study of a second aquifer has not been undertaken due to the reticence of Mexico to share information. The City of El Paso has undertaken a water reclamation program whereby treated wastewater is reused for non-potable purposes; but other jurisdictions have not done so due to cost considerations. Ownership disputes continue to rely on litigation rather than negotiation. All jurisdictions have adopted tiered rate structures and have instituted public education programs to promote water conservation; rate structures differ, however, and seldom do the different jurisdictions coordinate their water conservation efforts. Multi-jurisdiction drought management planning has been undertaken; but only within states, not on a truly regional basis.

Lacking is a regional approach to water resource management that reconciles the region's agricultural and municipal interests. That recommendation from the strategy statement remains unfulfilled. Given that the region encompasses portions of three states and two nations, regional management of water resources may never be politically feasible, but coordinated water resource planning may be attainable. The University of Texas at El Paso is currently working with New Mexico State University, the Universidad Autónoma de Cd. Juárez, the Houston Advanced Research Center, the Texas A&M University Research Center and the Environmental Defense to promote

such regional planning. These entities act as the support staff for a voluntary organization formed two years ago under the name the Paso del Norte Water Task Force. The Task Force consists of seventeen members including the U.S. and Mexican Commissioners of the International Boundary and Water Commission, and an equal number of members from the states of New Mexico, Texas and Chihuahua representing the region's large water utilities, irrigation districts, community organizations, large water users and experts in water resources. The Task Force has met more-or-less quarterly to review each separate agency's approach to water resource planning. Presently, the Task Force is embarking on a study of the legal and institutional options for undertaking cooperative, multi-agency regional planning.

The final Strategy Statement and the text of several of the technical reports are available at www.utep.edu/rio. For more information about this project, contact Ed Hamlyn at (915) 747-5667 or via e-mail at the following address: edhamlyn@utep.edu.

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