Growth at any cost?

Reconciling Economic Development Policy and Water Conservation
in the Rio Grande Basin

A Report of Panel Proceedings
St. Mary's University School of Law
May 28, 1999

Organized by: The Texas Center for Policy Studies, with the collaboration of:

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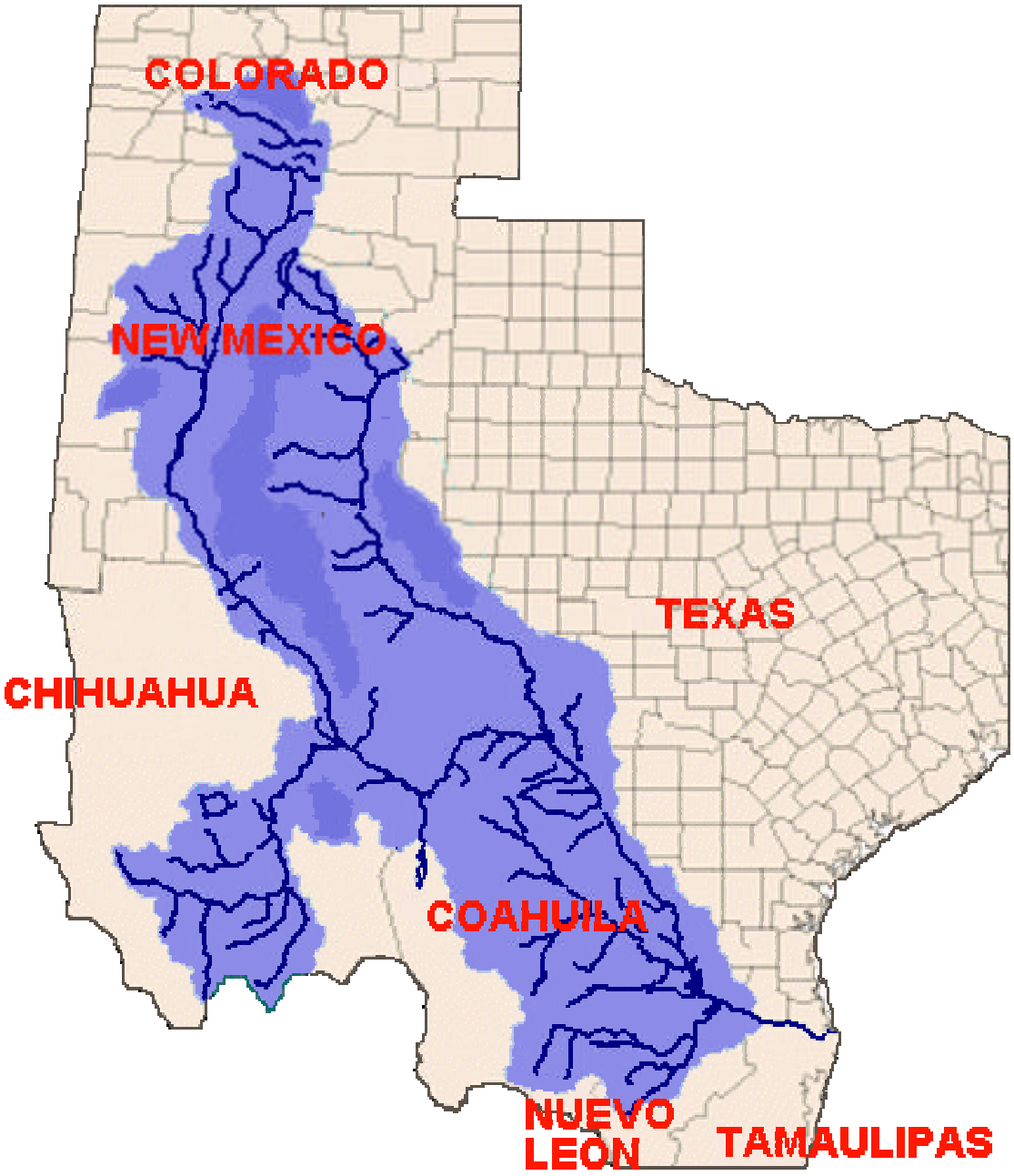

Map 1: The Rio Grande Basin

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Executive Summary

On May 28th, 1999, a group of concerned individuals with legal and policy expertise in water management and supply regimes in the U.S. and Mexico met at St. Mary's University School of Law in San Antonio. The topic of discussion was current water management and supply issues in the portion of the Rio Grande Basin encompassing the Mexican states of Tamaulipas and Nuevo Leon and the border region of Texas from Laredo to the Gulf of Mexico. The objective of the discussion was to present a synopsis of some of the recent water management studies conducted, provide a snapshot of how water management and supply issues are viewed "on the ground" by local residents, and generate some strategies for how grassroots groups might become more involved in cross-border water management discussions.

The St. Mary's panel was the culmination of four meetings project organizers convened over the past year in the Texas/Mexico middle Rio Bravo region[1]. These meetings were galvanized by a variety of issues related to water, including concern over dam projects - both constructed and proposed - in the region, and they provided a venue to share information from local and binational perspectives. After several of these meetings it was felt that a panel discussion involving a variety of actors with experience in policy and legal aspects of water management might illuminate more clearly actions that both local communities and state and federal agencies could take to alleviate the conflicts generated over our shared resource.

Two over-arching themes emerged from the St. Mary's meeting:

First, it is clear that the push to industralize the Texas/Mexico border region - and the consequent population growth - is largely disconnected from water supply planning and water management. Local actors frequently try to attract, through economic development incentives, labor-intensive manufacturing industries without due consideration to or an understanding of the implications for water management and existing supply. There is a sense that "more is better" - that growth equals development. On the other hand, while many water supply planners and managers have a fairly good understanding of the limits of the water supply available for their respective areas, they do not always have or take the opportunity to clearly communicate these constraints to local economic development interests.

This lack of integration between economic development activities and water supply planning has important and possibly severe consequences. The border's rapidly increasing population (drawn largely by openings in the maquila industry) and industrial water use itself, are placing strains on existing municipal water supplies. In some areas this increasing water demand may be at least partially met through reallocation of agricultural water rights, though this too will have consequences for the character and quality of life and the environment in different regions, particularly northeastern Mexico. The constrained supplies also create pressure for costly, inefficient and environmentally-damaging options such as construction of new reservoirs.

[1] Please see Appendix 1 for a list of project meeting dates, locations and participants.

Second, there is a general failure on the part of both water supply planners and managers and those responsible for the economic development of the region to view the Rio Grande as a vital ecological system. Currently, the river is viewed as little more than a 1,800-mile long water supply canal and international border. Local decision-makers are beginning to recognize the tourism dollars that birding can bring to this avian-diverse region, but the contribution that a healthy river system provides for bird habitats is less understood. Environmental water needs for instream flows in the river still rank last among competing uses.

There is potential for change, however, if the following principles take hold in both countries:

Integrate Water Planning and Economic Development Policy

- Long-term water availability information must be considered in economic development and industrial recruitment activities, with a clear understanding of the limits to growth that may exist in this arid region;
- The potential for industrialization to increase water demand, both directly and through attracting more people to the border region, must be recognized in the formulation of economic development strategies.

Recognize the Value of and Preserve a Healthy Rio Grande Ecological System

- The inherent worth and economic value of maintaining a healthy Rio Grande with sufficient instream flows and freshwater flows to the estuary must be reflected in both economic development and water management policies - indeed, truly comprehensive economic development capitalizes on and promotes its local natural resources as positive quality of life factors;
- The full adverse effects of dams on human and wildlife populations must be considered in evaluating water supply alternatives and these costs must be factored into the cost-benefit analysis of alternatives.

Improve the Water Supply Planning and Management Process

- Water supply planning and management in the border region can be greatly enhanced by making more information on water supply and demand available to the public (particularly in Mexico) and by better incorporating non-governmental interests in the water supply planning process. The Lower Rio Grande Valley Development Council's efforts to develop a long-term plan for the Lower Rio Grande Valley may provide an important model, at least for domestic water planning.
- Mexico should breathe life into the moribund Consejo de Cuenca[2] for the Rio Bravo and reform its structure to incorporate meaningful participation from the public.

[2] The 1994 Mexican Water Law established Basin Councils, consisting of government regulatory agencies and users, to discuss and plan for future water supply needs. The only Council which appears to have organized thus far is the Lerma-Chapala region, near Mexico City.

- While some improvements have occurred over the past few years, there is still a need for much better binational coordination and information exchange - at the federal, state and local levels - in water supply planning and mangement activities in the Rio Grande basin.

I. Background on border water project and collaborators

The Texas Center for Policy Studies (TCPS) provides technical and research assistance and policy development services to communities and citizens' groups working in the public interest. Our work is based on the principle that economic development policies must integrate environmental and social considerations, and our projects are conducted in partnership with citizen and community-based organizations.

The Centro de Estudios Fronterizos y de Promocion de los Derechos Humanos (CEFPRODHAC) based in Reynosa, Tamaulipas, was founded to work on environmental and human rights concerns in northern Mexico. For the past ten years, CEFPRODHAC has engaged in numerous community education activities and provides on-going services to area citizens. The organization has also studied the environmental and social impacts of El Cuchillo Dam on the Rio San Juan.

St. Mary's University School of Law Clinical Legal Education provides an important learning experience for law students while pursuing a fundamental mission of service to others. The Law Clinic introduces students to the practice of law through the representation of clients. Through their clinical work, students are able to provide a public service to the community by augmenting the resources available to serve the growing population of South Texas.

The Rio Grande/Rio Bravo Basin Coalition is a multi-national and multi-cultural non-profit dedicated to serving citizens throughout the basin as an organizer, information clearinghouse and advocate for the preservation and sustainable use of the Rio Grande and its tributaries and associated natural systems. The Coalition supports existing local organizations through training, project development, planning and communication networking services.

The Border Water Project began as an effort by these groups to increase local binational involvement in water supply planning for the Middle Texas-Mexico border region, and to provide a venue whereby local farmers, city water managers, environmental non-profit organizations and ranchers from both sides of the border might meet and discuss water quantity issues. There were three major events precipitating this initiative. First, irrigators in the Rio San Juan district near Miguel Aleman, Tamaulipas had watched as a new dam called El Cuchillo ("the knife") was constructed on the Rio San Juan to divert water to Monterrey, effectively cutting off their downstream supplies. Second, in 1997 the state of Texas passed Senate Bill 1, which mandated regional water planning throughout the state. The planning committees were to involve representation from the environmental community and members of the public to develop specific plans for managing regional water supplies by September 1 in the year 2000[3]. Third, the city of

[3] Please refer to the Texas Water Development Board website (http://www.twdb.state.tx.us) for more information on the state-wide planning process.

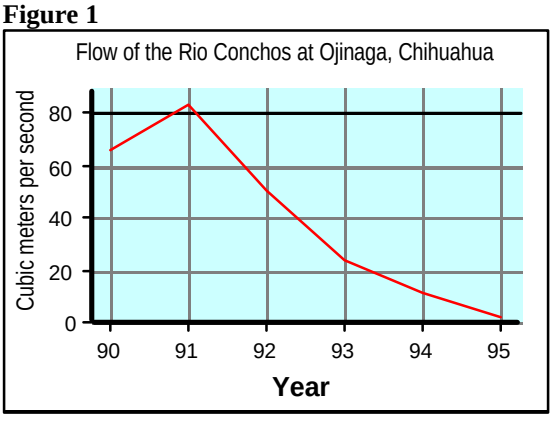
Laredo announced plans for construction of a hydroelectric dam above the city which created some concern in the downstream community of Zapata. The Border Water Project was initiated to assist local citizen representatives serving on the SB1 committee, promote sustainable water supply strategies, and share information with concerned residents.

Map 2. Project Region

II. Project area

The Rio Grande/Bravo basin encompasses 185,000 square miles and includes 13 million inhabitants (see Map 1)[4]. Half the basin lies in Mexico, and the majority of the flows reaching communities downstream of El Paso and Ciudad Juarez are provided by inflows from the Rio Conchos basin in Chihuahua, Mexico (see Figure 1). These flows have declined substantially over the last few years due largely to an extended drought in northeastern Mexico. Other Mexican tributaries to the Rio Grande are the Rio San Rodrigo above Piedras Negras, the Rio Salado upstream of Zapata and Ciudad Guerrero, the

Figure 1



[4] The Rio Grande/Rio Bravo Basin Coalition

Rio Alamo at Ciudad Mier, and the Rio San Juan at Camargo. Frequently, however, these streams provide little to no flow to the Rio Grande[5]. The two Texas streams providing inflows are the Devils and the Pecos River, both entering downstream of the Big Bend region and upstream of Del Rio, Texas.

The majority of the area served by the Rio Grande/Bravo basin is semi-arid to arid. For communities closer to the coastal plain, (McAllen/Reynosa to Brownsville/Matamoros) the Rio Grande is the only source of water for drinking, irrigating crops and for industrial use, due to the paucity of adequate quality groundwater. The city of El Paso is increasingly turning to surface water by purchasing nearby land with riparian rights attached, while Juarez is actually exploring more groundwater use. In Laredo and Nuevo Laredo, rapid growth is forcing communities to explore several options for augmenting future water supplies. For example, the city of Laredo is currently funding a study by the US geological Survey to test aquifer groundwater quality through surveying existing wells on private lands in Webb County.

A history of conflict marks water negotiations throughout the basin. It seems that only a water crisis forces the type of realistic evaluation that leads to compromise[6]. As discussed below, several factors are contributing to the potential for even greater conflict. These factors must be addressed before real equity among all users can be realized and very serious water battles can be avoided.

There are several major issues of concern that led to the establishment of this project.

First, Texas is the only western state where Right of Capture law still exists. The law allows landowners to pump unlimited amounts of water from reserves under their land, regardless of how this may affect neighboring landowners whose property lies over the same groundwater reserves, and regardless of how unlimited pumping may affect ecological functioning or the long-term viability of the aquifer[7]. For this reason, the Right of Capture law has often been referred to as the "law of the biggest pump." Though discussions have touched upon reform or even abolishment of the Right of Capture law, some legislators and water managers are adopting a "wait and see" attitude; saying that the Senate Bill 1 regional planning process that involves all stakeholders should be allowed to determine the fate of Right of Capture, and of the formation of groundwater conservation districts. In effect, this limits the ability of the legislature to regulate groundwater in the short term.

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[5] "Flow of the Rio Grande and Related Data": US IBWC; Water Bulletin Number 65, 1995

[6] See, for example, "Water Conflict in the Borderlands", Borderlines, July 1999 (Interhemispheric Resource Center: www.irc-online.org)

[7] The Texas Supreme Court recently upheld the Right of Capture in a case involving two east Texas landowners and Ozarka - a company marketing bottled water. The landowners complained that Ozarka had rapidly depleted their water supplies by pumping from an aquifer they shared with the company. The Texas Supreme Court decided to let the Texas legislature decide. A bill calling for the formation of 22 additional groundwater conservation districts in the state, which would allow for more local control over pumping of shared groundwater and restrict transfers of water outside the district, did not pass the 1999 legislative session. A modified bill allowing temporary water districts to be set up, and prohibiting restrictions on water transfers outisde the district, passed instead.

While the paper right to use water - both surface and groundwater - is recognized by law, there is some inequity in the notion that certain individuals may profit a great deal from the sale or lease of what is essentially a public resource when that resource becomes scarce enough to be extremely valuable.

Second, communities throughout the Rio Bravo basin continue to propose the damming of the Rio Grande and tributaries to the Rio Grande as a way of meeting increased demand for water by "increasing" supply. This practice is widely recognized, by many communities in the U.S. and internationally, as environmentally unsustainable due to negative impacts on both aquatic and human populations[8]. However, communities along the U.S./Mexico border are under increasing pressure to meet a constant need for jobs and to improve infrastructure to accommodate rapid growth. Even the redistribution of water - principally from agricultural to municipal uses - still requires that the municipalities address storage needs, and for some communities dams remain the preferred alternative.

Third, outside of the federal International Boundary and Water Commission (IBWC or CILA, for the Mexican acronyn), there is virtually no meaningful collaboration at the local or state level between the U.S. and Mexico regarding their shared water supply. Certain political conditions, which this report will outline in greater detail, have made this cooperation exceedingly difficult. The institutional role of IBWC/CILA limits its authority somewhat, as it was established simply to manage the international dams, oversee the international boundary and implement projects accordingly as stipulated by the 1944 Treaty. The agency has steadfastly adhered to this role, though in recent years some individuals and academics have called for the agency to broaden its scope in order to assist with increasingly difficult and complex binational water management decisions.

Fourth, with the establishment of water planning regions and committees set up throughout the state of Texas under legislation passed in 1997 (Senate Bill 1), institutionally-supported collaboration has attempted to ensure that all user groups - agricultural, municipal and industrial, and environmental - have a voice at the negotiating table. However, even this process, while inviting participation from Mexican federal government entities like IBWC/CILA and the Comision Nacional de Agua (CNA, or National Water Commission), is still focusing its studies on one side of the river. Nor do the regional planning groups involved in water planning for the Rio Grande invite formal participation from Mexican NGO's or the Mexican public.

Finally, sometimes NGO's representing legitimate environmental uses may feel at a certain disadvantage in that they must become water "experts" overnight in order to participate equally at the negotiating table, whereas many of the other members of the committee may have extensive experience analyzing water data and managing its distribution. The balance of power, then, still lies with the interests who have traditionally controlled water: in Texas, with the irrigation districts, and in Mexico, with the federal government.

[8] The World Commission on Dams, for example, was established by the World Bank and the World Conservation Union to study the social, environmental and economic costs of some of the world's major dams and assess alternatives and related policy options (for more information see the WCD website: www.dams.ord/wcdwork.htm).

III. Presentation of papers

At the St. Mary's panel, individuals shared the results of studies they had individually conducted in order to provide some background for the discussion. This section provides some overview of those presentations, while the complete papers are provided in the Appendices to this report.

Middle Rio Grande Region

Laura Pierce[9]
Rio Grande Rio Bravo Basin Coalition

Karen Chapman
Texas Center for Policy Studies

As mentioned above, the Border Water Project sponsored several regional meetings leading up to the St. Mary's panel. Some of the key issues discussed during these meetings are highlighted below.

Involvement in Senate Bill 1 planning process
Many local decision-makers do not understand entirely what Senate Bill 1 means and what changes it will bring about. Some feel that it will only lead to a plan with no serious funds attached. Others feel that it is a positive step to the extent that it "streamlines" the permitting process for water infrastructure projects and makes obtaining assistance for such projects easier.

Others are concerned that the responsibility for making water supply management decisions is being handed over to consultants and that the information that is generated is difficult for the layperson to understand. Some of the citizens involved in both the Region M planning committee and this organizing effort by Texas Center for Policy Studies mentioned that Lower Valley residents (Cameron, Hidalgo and Starr counties) are much more heavily-represented on the Region M committee and stand to gain more as a result. The balance of water ownership does lie with the Lower Valley irrigation districts, since upstream communities are primarily using water for municipal purposes and not for irrigation. Ranches in the middle Rio Grande area typically use groundwater for stock.

Regional and cross-border information exchange and involvement
Another element that emerged from these discussions is the lack of awareness about what is taking place on the other side of the Rio Grande. Both Texas and Mexican stakeholders realize that the different laws and sovereign jurisdictions limit binational cooperation and information exchange at the local and state level, at least in a publicly accessible venue. The general consensus is that due to operational structure and funding problems, Mexico does not have

[9] Please see Appendix 2 for the complete paper.

adequate data on water usage, and the information that exists lies solely within the Comision Nacional de Agua, or CNA.

Another reason for this lack of cooperation is that the issues affecting neighbors on either side of the border may be quite different. For example, irrigators in the Mexican border communities near Ciudad Mier and Miguel Aleman are embroiled in legal negotiations over the waters from the Rio San Juan impounded by El Cuchillo dam[10], while ranchers across the river in Zapata and Webb counties are primarily concerned with protecting their groundwater pumping rights and ensuring that sufficient water is available in the future to keep cattle alive and stay in business. With such distinct issues to focus on, bringing Mexicans and Texans to the table to discuss common concerns will involve a more comprehensive and long-term effort, possibly involving agency cooperation. At the very least, such an effort would provide an on-going venue for citizens to air concerns and explore common solutions to transboundary resource issues.

An additional obstacle to cooperative conservation among up- and downstream communities is that local water managers do not feel inclined to impose strict water conservation measures if "it will just go downstream to some other user". The regional planning committees are a way to promote cooperative planning and management, and exchange among regional groups has led to increased understanding of the issues in other regions. However, there is still a sense of isolated self-interest and competition among every border community along the Rio Grande for growth potential, infrastructure investment and funding.

At a Border Water Project meeting in Zapata, participants broke down into smaller groups oriented around their particular interest or field (land management, policy, and education) and came up with: 1) one major water issue; 2) ideas for how binational cooperation might or might not be useful in the context of the issue; and 3) an action or recommendation to implement through cooperative effort.

The table below represents the outcome of the small group sessions.

	Land management	***Policy***	***Education***
Issue	Accelerated erosion and siltation caused by poor reservoir management	Protection of property rights, water quality and quantity, public awareness and appropriate legal solutions	Awareness, continuous education at all levels, city environmental agency involvement
Binational Cooperation	Not sure how to instigate binational cooperation - might be useful to learn from other landowners/managers	Creating binational awareness can lead to action, is a question of how to share information	Making cross-border contacts good, reinforces the concept of a river which unites people rather than divides
Action or Recommendation	Reduce root plowing, revegetate native species, hold a symposium of landowners, managers and agency representatives (NRCS)	Workshop on certification process for NADBank funding for smaller communities, establish clearinghouse where information can be received, summarized and distributed, hold a regional NGO congress to produce a joint resolution	Establish library/ information center, collaborate with municipalities, distribute newsletter, involve one teacher from each - elementary, middle and high school - to participate

[10] See Professor Sanchez' paper: "Mexico's El Cuchillo Dam Project: An Example of Why an Enforceable Human Right to a Healthy Environment is Needed" in Appendix 2.

As is evidenced by this table, there is little consensus on what binational cooperation might bring other than information exchange. This points to a need for greater public awareness about shared groundwater resources, about inflows from tributaries on both sides of the border and what might affect those tributaries, about the planning processes taking place on either side of the border that might affect individual water users and about the ecological functioning of the river as a system whose protection is dependent upon policies enacted and enforced in both nations.

Maintenance of healthy instream flows

Representatives of environmental organizations involved in water planning and agency committees say that it is difficult to quantify the amount of water necessary for proper ecosystem functioning, given the dynamic and fluctuating nature of those ecosystems, and that this reality leads to a disadvantage in hammering out the types of agreements that demand bottom-line numbers. Agencies like Texas Parks and Wildlife, which are conducting a review of the instream flow requirements for bays and estuaries in Texas, may come up with some numbers stipulating instream flow requirements for the Rio Grande estuary, but the data is not available yet.

One example of preserving environmental water uses is found in the Lower Rio Grande Valley, where the U.S. Fish & Wildlife Service owns about 14,000 acre feet of water rights and uses these rights for irrigation of riparian (riverine) habitats and wetlands that preserve waterfowl populations and endangered and threatened species. Among other things, the Service is responsible for implementing plans that will ensure the survival of threatened and endangered species. The Wildlife Corridor project is one such habitat conservation effort; an on-going project to purchase, from willing sellers, a string of connected lands along the river and of some habitats around cities for restoration and protection. These areas and their corresponding wetlands are important for maintaining the last vestiges of native forest and scrubland - 95% of which have been lost to development over the years, and which provide habitat for species of concern such as the ocelot, Rio Grande lesser siren[11] and altamira oriole.

At the private conservation level, the National Audubon Society maintains a sanctuary which flood-irrigates a naturally-formed oxbow lake each year for nesting species of birds and education of school groups. At the state level, Texas Parks & Wildlife owns and manages some water rights also. These refuges and preserves provide important recreational opportunities for local residents and bring in some $100 million dollars annually in nature tourism for the region. However, the amount of water that can currently be said to serve environmental purposes in the entire mainstem of the Rio Grande and associated wetlands is only 25,000 acre feet - only two-tenths of one percent of the total water rights allocated for use in the system. Moreover, currently there is no definitive existing instream flow requirement stipulated for maintenance of healthy aquatic and plant life in the Rio Grande.

Diminished flows in the Rio Grande have led to other problems, aside from decreasing habitat values. Introduced hydrilla and hyacinth plants have grown profusely in parts of the river channel downstream of Falcon Dam, and have been able to choke off the channel entirely in some places. Periodic high flows would push the plants out, but the river water level is regulated to such an

[11] *Siren intermedia,* an eel-like, freshwater amphibian with external gills and small anterior appendages

extent, and water is considered too scarce to simply send downstream, that this is not likely to happen. Instead, Texas Parks and Wildlife contracts a mechanical harvester to physically remove the plants when the problem becomes so severe that irrigators cannot get water through the channel, at a cost of $100,000 to $150,000 for each harvesting event. A local spokesperson for Texas Parks and Wildlife believes that the plants will continue to be a problem in the Rio Grande[12].

Dams

Water that is transferred from one party to another through lease or purchase is usually captured through the current water conveyance system. In other words, a municipality that buys or leases water from an irrigation district often pays for the use of the districts' infrastrucutre and pays the electrical pumping costs as well. In this way, water transfers and purchases do not require additional infrastructure. Where there is inadequate storage, however, dams seem to be the primary option under consideration. Coming up with alternatives to dams as a means of capturing these flows is a desirable, but by no means simple task. Dams on the Rio Grande are proposed for the cities of Laredo and Brownsville. In the middle Rio Grande, Zapata, downstream of Laredo, is concerned about the effects of an upstream dam on its water supplies and on water quality.

Most residents are divided as to whether more dams on the Rio Grande are preferable. This paper will refer repeatedly to the detrimental effects of El Cuchillo - a dam built on the Rio San Juan in Tamaulipas, Mexico - to capture water for the rapidly-growing city of Monterrey. The project effectively strapped an entire irrigation district, touched off an acrimonious debate between neighboring states, between rural and urban interests, and between economic development and agricultural interests. The new dam even affected an older reservoir downstream, cutting its water supply and shutting down most of the nature-based tourism around the previous reservoir site.

Lower Rio Grande Region - The Integrated Water Resource Plan

Richard Hinojosa
Lower Rio Grande Valley Development Council

The Lower Rio Grande Valley Development Council (LRGVDC) represents the counties of Cameron, Hidalgo and Willacy in the Lower Rio Grande Valley. In the late 1970's, water rights were divided up, or adjudicated, through a legal settlement whereby rights were split among municipalities and irrigators. The decision seemed fair at the time it was drafted, but high rates of population growth caused some cities to experience water shortages. These cities were faced with two options: buy more water and/or water rights, or develop working relationships with irrigation districts.

In the Lower Rio Grande Valley, Mexico actually supplies 95% of the rivers' water, and the regions' drinking water, primarily from the Rio Conchos basin in Chihuahua. Water from the Rio

[12] Personal communication, Randy Blankinship, TPWD Coastal Fisheries Division, Brownsville, Texas

Conchos flows through the Big Bend region and west Texas, into the Falcon-Amistad reservoir system. Falcon and Amistad provide 1.2 million acre feet[13] (maf) annually to about 1.2 million residents of the region.

Since 1995, drought conditions have made LRGV citizens more aware of the significant impacts a dwindling water supply can have on a region. During the summer of 1998, the U.S. share of water in the Falcon-Amistad reservoir system fell to 19%, while the Mexican share dropped as well but remained near 26%. Mexico cut off water for irrigation use altogether, saving what remained of their water for municipal use.

The impacts of that drought were severe: $160 million in crop losses, $40 million in livestock losses and a loss of one in five agricultural jobs. These impacts are still having an effect - not only on agriculture in the valley. Last fall, there was insufficient irrigation water and farmers did not call for water to be released. As a result, 15 out of 28 irrigation districts had insufficient water to use for conveying water to the cities they served[14]. The water shortage galvanized a million-dollar planning effort involving municipalities, water supply corporations, irrigation districts, local leaders, Texas A&M University and local consulting engineers who were contracted to do the studies. The Integrated Water Resource Plan - or IWRP, is the result of this effort.

Study Conclusions

The dramatic growth experienced in the Lower Rio Grande Valley will result in increased demand for municipal water. However, as farmland is converted slowly to urbanized areas, a corresponding drop in irrigated crops should compensate for the additional water needs of the city.

A ten-year action plan was developed which outlines strategies for saving 400,000 acre feet per year, at a cost of $100,000,000, or $250 per acre foot of water saved. This is a relatively low investment for the return on water as compared with other systems around the state. The responsibility for water savings lies primarily with agriculture, but the plan calls for some of the costs to be paid for by the individual cities. These cities will then be able to use the water saved. Water will be conserved through conveyance system improvements to reduce seepage and water loss, improved metering practices and improved technology (such as drip irrigation) for on-site conservation.

[13] One acre foot = 1,233 cubic meters, or the amount of water necessary to cover a square acre with water at a depth of one foot.

[14] For clarification on this concept: the city of McAllen has about 2,000 acre-feet of water for municipal use, but they have no pumping system at the river for transport. They have three different contracts set up with separate irrigation districts to pump and convey the water they need using existing irrigation infrastructure. The contracts may vary from district to district, and the cost is factored into the transportation of the water

IV. Panel Discussion

Panel members agreed that the Integrated Water Resource Plan was one of the most collaborative and comprehensive efforts to realistically document and plan for future water needs. The discussion centered around the role of regional actors and Mexico in the planning process. A major concern mentioned was that current water planning efforts are dialogues around meeting future projections for growth and are not examining a more fundamental question of limiting growth. Several questions were posed during the discussion regarding whether or not communities were facing this question, or if they were simply plotting water demand projections and then scrambling to meet expected demands. Panelists felt that this is a major flaw in current water supply planning, and in order to avoid the type of crisis planning that has characterized the history of the region and created some of the problems in place today, communities need to begin integrating more meaningful variables into their discussions.

Mr. Hinojosa clarified his comments by saying that the planning process he described had begun even before the state regional planning process mandated by Senate Bill 1 had taken place. The IWRP is being incorporated into the Region M planning process, and this group is comprised of representatives from other sectors, including the evironmental community. In addition, members of the Mexican government are invited to attend the Region M meetings, though they do not have a formal vote. There are plans to hold the next Region M meeting in Mexico.

Mr. Hinojosa also said that there had been similiar concerns echoed from other groups regarding the apparent lack of discussion around limiting growth. However, he stated that since the planning process is community-based, and all water users are involved, they do have some control over what is discussed and how future water needs will be taken into account. Whether or not urbanization is desired, or growth is or is not planned, the limiting factor will continue to be water. Municipalities, in other words, cannot simply take water away from agriculture. Existing water rights holders and designated uses have some control over aspects of water planning, and will continue to be a factor in water distribution.

Economic "Development" and water

An additional problem discussed at the St. Mary's meeting is that water management on the local level occurs in a restrictive framework. Utility companies are given the responsibility to find more water - by those promoting growth in the region - but are not asked whether or not the water is available. Conversely, water managers who do have a good idea of water availability are not stepping up to call a hault to the continuous demand for water. These two interests have little incentive to cooperate under the existing framework.

There was a great deal of concern that efforts to promote industrialization and growth on both sides of the border are creating a situation where other users' needs will be undermined, despite the best intentions of the planning processes underway. A panel member mentioned that the McAllen Economic Development Council (largely responsible for the majority of the maquiladora growth in Reynosa) spends millions on promotional incentives which offer water free to companies that locate in the area, without a realistic accounting of the broader costs of such

policies. The July "Borderlines" issue featuring border water conflicts also describes unequal access to water, citing an example of a Piedras Negras maquiladora which uses ten huge washing machines to produce 21,000 pairs of permanent press pants daily. Plant managers said they never had a problem getting enough water. A nearby colonia, however, cannot get the authorities to provide enough potable drinking water for its residents[15].

There are other costs created by perpetuating the reliance on industry as a primary economic growth strategy. Population pressure from individuals and families seeking jobs in those industries creates growth in outlying areas of cities. Subsequently, the needs of these populations must be met, at a high cost to taxpayers, and at a time when water supplies are already stretched too thin.

Some panelists expressed the view that the current planning in Mexico which is supposed to be happening through the Consejo de Cuenca, is really not planning from a collaborative perspective but a process of securing who has the rights to the water. They claimed that recent developments, especially with regard to the El Cuchillo and Las Blancas[16] dam proposals, seem to indicate that the major factor driving water allocation will be municipal/industrial expansion. Despite the low wages and higher environmental costs they bring with them, maquilas and other types of industry continue to represent an attractive answer to people looking desperately for a way to make a living, and for communities trying to capitalize on expanding growth.

Binational Collaboration

Further discussion revolved around binational cooperation and collaboration, and about the possibility for real conflict in the border region and in the entire Rio Grande/Bravo basin over water use and allocation. Some panelists felt that though many communities talk about "sister cities", that Mexico and the U.S. are not good neighbors at all when it comes to collaboration. The point was made that there are other things that need to change in Mexico - the nature of the political system, the legal culture, the need for decentralization on a realistic level and not just on paper - before any binational water could be effective. As an example, in 1972, Minute 242 was added to the 1944 IBWC treaty regulating transboundary waters, which is basically an agreement that through the International Boundary and Water Commission, U.S. and Mexican states would negotiate a management structure for shared groundwater resources, but since then no real time has been committed to making this a reality.

The role of NGOs & legal structure

Participants agreed that non-governmental organizations (NGOs) in Mexico are severely under-funded and have a difficult time gaining a strong voice in policy negotiations. For this reason many NGO's have developed a reliance on the press for quick, cheap and accessible publicity, though often legal tools might be available. There was some disagreement as to the extent of NGO success and empowerment. Several participants expressed concern that the government continually shuts out NGO's and displays a closed attitude toward them unless and until they

[15] "Water Conflict in the Borderlands", Borderlines, July 1999; I Coronado & G. Korous, IRC

[16] The Las Blancas dam is to be constructed on the Rio Alamo in the state of Tamaulipas to make up for the water lost through the El Cuchillo project. Again, this dam project was apparently planned and is underway without any public review.

become more effective and thus a greater threat. Dr. Szekely in particular noted that the only real change will be brought about when NGO's become empowered, either through building coalitions or through utilizing legal tools. The panelist added that there has been a reluctance, due in large part perhaps to the lack of financial resources, to go through the process of strengthening the legal system. His opinion was that the evolutionary process U.S. NGOs had to go through in order to utilize the legal system to their advantage and thus gain access to the decision-making process needed to happen in Mexico as well.

However, Ricardo Mier of CEDANEM and Arturo Solis of CEFPRODHAC pointed out that despite limited resources and in the face of practically no visible means of support, NGO work had led to some important advances in the political and community awareness arena. Two examples were offered of recent cases in Nuevo Leon, in which government representatives appeared to have been at least partially swayed by public pressure to deny both the import of toxic wastes to the state and to take swift action against industries experiencing releases of toxic gases. These cases had provided the impetus for NGO's to become more involved in negotiations with government environmental authorities on some important initiatives such as legislative reform, and to push for the governor of Nuevo Leon to declare "semi-publicly" a general commitment to environmental protection.

An existing platform that may be able to assist Mexico in this regard is the Commission on Environmental Cooperation (CEC)[17]. After a long start-up period, there is hope that this venue may open the door for some changes.

Participants felt strongly that U.S. and Mexican NGOs needed to work together to expand their roles in domestic and binational agency negotiations. Other panelists voiced the opinion that even if the Mexican Consejo de Cuenca has not resulted in actions yet, it might still become an opportunity for the NGO community to become involved because they play an important role in enriching the debate and enhancing information exchange. They bring new concepts and ideas to the table that are a result of working with communities they serve, and these must be factored into the decision-making process for any agreement to be successful in the long term.

Some participants were of the opinion that human and environmental rights might be more closely linked. They stated that human rights-oriented NGO's in Mexico and throughout the world have been successful, especially internationally, at raising awareness for human rights issues. While in Mexico there has been for the past ten years a very strong campaign for human rights, the Mexican government does not exhibit strong ecological politics; the lack of impetus behind initiating the Consejos de Cuenca manifests this indifference. The right to clean air, drinking water and a healthy environment, however, should be considered basic human rights, and have everything to do with the environment as well.

Other panelists stated that there is a need to educate all the "sister cities" on the border and throughout the basin to seriously consider the kinds of questions raised in meetings such as these. This education would need to be grounded in the recognition that when all the power lies within

[17] The CEC was established as a side accord to mediate trade and environment disputes between countries participating in the North American Free Trade Agreement - Canada, U.S. and Mexico.

the grasp of one or two entities, those entities have no reason to pay attention to anyone else. In this case, for example, it is often the financial purse-holders who control where the water goes. Panelists recommended that when the economic development community sits down periodically to discuss development, they must also go beyond lip service to concrete discussions of how to resolve problems of lack of water and contamination.

These problems are manifested in the locally famous case of El Cuchillo dam in Tamaulipas, Mexico. Representatives from the Irrigation District 026, near Ciudad Camargo, pointed out that their historic agreement with the government, signed in 1906, was for each of eleven irrigation districts to receive a certain amount of water to use for cultivation. With the passage of years and urban expansion, the government attempted to change the balance of water ownership with a new agreement in November of 1998, which five of the eleven districts refused to sign. This agreement came after El Cuchillo[18] had already been constructed on the Rio San Juan which cut off waters downstream traditionally used by these irrigation districts, and which shut down recreational tourism businesses operating near Marte R. Gomez dam downstream. The districts had nothing to do with the construction of this dam and had not been part of the negotiations.

The irrigation district undertook to file the necessary legal complaints, but have also been very active promoting their case in the U.S. to any groups who would listen. After a long and tortuous round of incidents involving highly public criticisms between the governors of Tamaulipas and Neuvo Leon, the resignation of the Nuevo Leon governor, and public demonstrations in both states and rulings by the National Water Commission, the affected parties are still waiting for adequate compensation. The 026 irrigation district also tried to bring their story to the attention of the Region M planning committee, but were denied the opportunity, primarily for reasons of diplomacy. In addition, as has been pointed out, the current discussions under SB 1 are not extending to the binational public, nor are they attempting to define what Mexico's future water supply needs might be.

A Basin Council was established through the November agreement for the Rio San Juan, which is a sub-basin of the Rio Bravo, but because the representative seats offered to user groups in comparison with agency seats was so low, the irrigation district refused to participate. They remain opposed to the dam project and hopeful that what they feel is their fair share of water will somehow be restored to them, perhpas through a change in political administrations.

[18] El Cuchillo is discussed in more detail in Professor Sanchez' paper and later in this report

V. Part Two: additional papers

Lessons from the Colorado River Basin and Comparison to the Rio Gande Basin[19]

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The Pacific Institute is an independent non-profit center founded 12 years ago to pursue research and policy analysis in the areas of environment, sustainable development and international security. Underlying all of the Institute's work is the recognition that global poverty, environmental degradation and political conflict are fundamentally interrelated and must be addressed in an interdisciplinary manner.

The Pacific Institute has produced a number of publications including a report on the sustainable use of water in California and in the Lower Colorado River Basin. The "Success Stories" publication[20] describes a number of different strategies that municipalities and farmers have employed, other than building new dams and augmenting supply, that have successfully kept water consumption lower even though populations have increased.

In looking at what makes these projects successful, several common themes emerge. Among these, probably the most significant for water managers and decision makers in the Rio Grande Basin, from a regional and binational context, are that: 1) the most successful water management solutions have brought together individuals with different agendas to work together on common goals; 2) smart regulation is better than no regulation - in other words, government regulation does have a role to play in setting and enforcing the standards to achieve, 3) economic innovation leads to cost-effective changes - pricing and offering investment incentives can galvanize adoption of new technologies; 4) The more water users know about their own water use and the options available to them the better decisions they make.

The Colorado and Rio Grande river basins share some similarities in that the two rivers' drainage basins are roughly the same size, both supply water to Mexico (though the Colorado is viewed as a point source and there is no formal binational management effort), and both constitute a limited water supply in an arid region. There are similar institutional players in the region of the Colorado as well, including the IBWC, NADBank, Border Environmental Cooperation Commission (BECC), Bureau of Reclamation, etc.

The differences are that though the limitrophe of the Colorado - the geographical area encompassing the mainstem of the river, is only 2% of the length of the Rio Grande, the Colorado

[19] Please see Appendix 2 for the complete presentation.
[20] For a copy of this report please see contact information for the Pacific Institute in the Appendix

carries up to six times more water than the Rio Grande. Also, reservoir storage levels have not dropped as dramatically as along the Rio Grande. In fact reservoir levels in the Colorado below 80% would cause great alarm, whereas in the summer of 1998 Rio Grande reservoir levels dropped to 19%. Since the construction of Hoover Dam, there has never been a water shortage in the Colorado River basin - water rights holders have been able to receive their share of water, and sometimes, as in the case of California, more than their fair share. However, with high population growth expected in Las Vegas (up to 1000 new residents arrive weekly), southern Nevada and southern California, future re-distribution of water is likely to occur.

Under treaty obligations Mexico receives 1.5 million acre feet annually from the Colorado, primarily for irrigation in the Mexicali Valley and for urban and municipal use in the cities of Mexicali and San Luis Colorado. Some of the water is even transported to Tijuana and Ensenada. Mexico, however, is often excluded from discussions regarding the management and operation of the Colorado River, on topics such as the release of excess storage waters (which has created flooding in Mexico), the restoration of the Salton Sea, determination of surplus flow criteria, regulations regarding off-stream water banking, and potential impacts of the lining of the All-American canal. In addition, the Lower Colorado Multi Species Conservation Plan underway has failed to include Mexico and the delta region in its group, causing some environmental representatives to resign in protest.

Despite the lack of historic binational cooperation, there have been a few collaborative efforts: the city of Mexicali and the US EPA participated in the joint construction of a wastewater treatment plant which will recycle treated wastewater for other uses in Mexicali. In addition, the IBWC and CILA have made some attempts to jointly address water quality concerns, and the San Diego County Water Authority has been engaged in discussions with Mexican agenices regarding a Colorado River conveyance project.

Here again binational collaboration can be found in the NGO community, which often takes time to develop but can lead to mutually beneficial outcomes. Fifteen U.S. and Mexican NGOs recently gathered at a workshop in Tucson to generate a set of principles regarding the restoration of the Colorado River Delta and pledged to work together. The group hopes to provide a venue for Mexican organizations to voice their concerns to river managers in the U.S., forcing recognition of the fact that their actions have an effect south of the border.

Model Binational Agreements

Dr. Alberto Szekely
Mexico City, Mexico

Dr. Szekely briefly discussed a document called the Bellagio draft treaty on transboundary groundwaters. As a public interest lawyer, Dr. Szekely had been involved in the negotiations and described the purpose of the agreement: to establish the framework for a comprehensive protocol for the management of shared transboundary groundwater resources. The treaty, drafted in 1989, called for either the creation of a new international commission to collect and maintain data and

write management plans for shared transboundary aquifers, or a revision in the IBWC mandate which would allow it to do so[21]. The discussions were initiated with an underlying purpose of examining not just present-day problems along the border between the U.S. and Mexico, but historic trends that led to the current situation, and how they might also affect the future. The overall objective was one of "preventative diplomacy" - attempting to avoid foreseeable conflicts by undertaking planning processes before the situation became unmanageable.

The idea of sitting down at the negotiating table was to present a variety of legal instruments that were within reach of the participants and which might be added to existing treaties and agreements so as not to begin at ground zero. The upshot of these talks was the Bellagio Treaty - designed as a draft model to assist in further negotiations.

Talks also centered around oil resources in the Gulf of Mexico along the transcontinental shelf and how to share both in the resource and in taking responsibility for the environmental effects of exploration and extraction. A substantive tool that emerged from these discussions was the Puerto Vallarta Draft, which is in use today.

Another international agreement mentioned was the Ixtapa Draft, designed to limit groundwater pumping in the Hueco-Bolson and Trinity-Edwards aquifers in west and central Texas and corresponding northern Mexican states.

The 1996 United Nations Convention on the Management of International Rivers also set up a framework for a regime to impose some limits on water resrouce extraction. Neither the U.S. nor Mexico signed the Convention, both countries believing, along with many other countries, that they have adequate systems in place to address their own problems, and that strides are being made in the direction of ecological equilibrium.

Key to the success of all these agreements lies the political will of participating governments to address transborder environmental impacts. This will has been lacking, but the current situation may shepherd both countries into a time where negotations are no longer voluntary but required in order to maintain the stability of the region.

Water Supply and Management in Mexico

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Recent studies on water resource management in Mexico have concluded the following:

- Water is and will continue to be a limiting factor for development and growth

[21] Challenges in the Binational Management of Water Resources in the Rio Grande/Rio Bravo; D. Eaton & D. Hurlbut, 1992
[22] Please see Appendix 2 for the complete paper.

- Water pricing will need to be restructured - currently prices do not reflect in any way the real cost of water
- The National Water Commission (CNA) role in binational negotiations has limited potential, but they should be involved in economic development discussions
- Financing for technological improvements in water storage and conveyance is tied to pricing but also requires clarification of water rights
- Those responsible for water management need to be professional water managers
- There should be transparency and accountability in management of finances related to water use - especially with regard to use fees
- There must be a regular drought management policy in place for Mexico

The Lower Rio Bravo basin is of crucial significance for Mexico. In terms of international trade, as well as industrial and agricultural activities, this resource is vital to the health of the regional economy.

In spite of its significance, a comprehensive understanding of the region is lacking. Available research shows that the current pattern of water use in the Lower Rio Bravo is not sustainable. Research has shown concerns about the sustainability of the continued wasteful use of water, of the continued reliance on supply-side water management, of infrastructure, of observed patterns in the production process (as well as of consumption), of the water needs of the river ecosystem itself, of the financial structure as well as the institutional, legal and political frameworks needed to maintain reasonably good water quality. While this research is perhaps too much concerned with the scenario of 'business as usual,' it does present realistic concerns about water and social sustainability.

In addition to the supply-side problems listed above, the region also faces demand-side pressures. The current and projected future rate-of-growth in the metropolitan area of Monterrey raises fundamental questions about long-term sustainability. The challenge is to find a proper balance between the careful use of existing volumes and the need for new sources of water. When demand grows faster than supply, demand management is required to bring water use into balance with supply. Therefore, more attention should be given to the control of the demand side, before considering any other options for additional water supply.

A Qué Precio el Desarrollo?

Como reconciliar los Políticos del Desarrollo Económico y la Conservación de Agua en la Cuenca del Río Bravo

Reporte de una Conferencia Realizada en la Escuela de Derecho,
Universidad de St. Mary's
28 de Mayo, 1999

Organizado por: Texas Center for Policy Studies, con la colaboración de:

Centro de Estudios Fronterizos y de Promocion de los Derechos Humanos
St. Mary's University Law Professor Raul Sanchez
The Rio Grande/Rio Bravo Basin Coalition
Amigos de Guerrero Viejo

Este proyecto fue patrocinado por la Fundación Ford y el Fondo Norteamericano para la Cooperación Ambiental

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Introducción

El 28 de mayo de 1999 se reunieron un grupo de personas de México y los Estados Unidos- abogados, científicos, académicos, representantes de organizaciones no gubernamentales y agricultores - en la Escuela de Derecho de la Universidad St. Mary en San Antonio, Texas para discutir temas sobre el manejo y abastecimiento del agua en la porción de la cuenca de Rio Bravo que abarca los Estados Mexicanos de Tamaulipas y Nuevo León y la región fronteriza de Texas desde Laredo hasta el Golfo de México. El propósito de esta reunión fué presentar una sinopsis de estudios recientes sobre el manejo del agua; tener una idea de cómo las comunidades locales perciben el tema del agua; y desarrollar estrategias con el propósito de que organizaciones locales tengan un papel más activo en discusiones binacionales sobre el manejo del agua.

La reunión en la Universidad de St. Mary fué la culminación de cuatro reuniones efectuadas este año en la región central Texas/México del Río Bravo[23]. Estos encuentros son parte del Proyecto de Agua Fronteriza del Centro de Estudios Políticos de Texas. El mismo tiene como uno de sus propósitos involucrar a las comunidades locales en un intercambio transfronterizo de información sobre alternativas para el abastecimiento de agua en la región fronteriza. Durante estas reuniones se discutieron un número de temas referentes al agua, incluyendo inquietudes acerca de las presas --construidas y propuestas -- en la región. Asimismo, éstas reuniones sirvieron de vehículo para el intercambio de información sobre perspectivas locales y binacionales. Uno de los resultados de estas reuniones fué el de formar un panel constituido por individuos con experiencia en la política y los aspectos legales del manejo del agua para ayudar a definir estrategias que ambas, las comunidades locales y las agencias federales, podrían llevar a cabo para aliviar los conflictos existentes sobre el manejo de aguas binacionales.

Dos temas principales surgieron de la reunión de St. Mary:

Primero, está claro que la industrialización de la zona fronteriza Texas/México - y consecuentemente el crecimiento de la población - está completamente desconectada del proceso de planeación para el abastecimiento y manejo del agua. Cada región trata de atraer industrias de mano de obra pesada, a través de incentivos económico, sin considerar o entender las implicaciones que ésto podría tener en la disponibilidad de agua en el área. Los promotores de ésta idea creen que "más es mejor" - que crecimiento significa desarrollo. Por otra parte, aunque parece que las personas encargadas de manejar y planificar el abatecimiento de agua tienen un entendimiento de los límites en la cantidad de agua disponible en sus áreas respectivas, no siempre tienen la oportunidad o no se toman la molestia de informar sobre éstos límites a los interesados en el desarrollo económico local.

Esta falta de coordinación entre el desarrollo económico y la planificación para el abastecimento de agua tiene consecuencias importantes y posiblemente severas. El crecimiento en la población de la frontera (debido en su mayoría a la industria maquiladora) y el uso de aguas por parte de las industrias, provocan presiones en la cantidad de agua existente. En algunas áreas, el aumento en la demanda de agua se puede aliviar, parcialmente, con la reasignación de derechos a agua

[23] Ver Apéndice 1 que contiene las fechas de las reuniones y los participantes.

designada para la agricultura, aunque ésto también tendrá consecuencias en la calidad de la vida y del medio ambiente de las diferentes regiones, particularmente en el noreste de México. La poca cantidad de agua disponible crea presiones, promoviendo la consideración de opciones costosas, ineficientes y que causan daño al medio ambiente como son la construcción de presas.

Segundo, tanto los que planean y manejan el abastecimiento de agua, como los que son responsables por el desarrollo económico, no consideran al Río Bravo como un sistema ecológico vital. Sólo ven al río como una extensión de 1.800 millas de agua y como una frontera internacional. Sin embargo, comienzan a ver al río en términos de la cantidad de dinero que podrían atraer por medio de turistas interesados en observar las aves de la región, pero fallan en entender la necesidad de un río saludable para la subsistencia de dichas aves. La necesidad de agua para el uso ambiental queda en último lugar cuando se consideran otras necesidades.

Esta situación podría cambiar si ambos países practicaran los siguientes principios:

Integrar los procesos de Planeación sobre el agua y de Desarrollo Económico

- La información sobre la disponibilidad de agua a largo plazo debe considerarse durante la planeación del desarrollo económico y en el reclutamiento de industrias, teniendo un entendimiento claro de los límites de crecimiento que debe existir en esta zona árida;
- El posible aumento en la demanda de agua debido a la industrialización, sea de manera directa o a través del flujo de personas al área en busca de trabajo, debe analizarse cuando se formulen las estrategias de desarrollo económico.

Reconocer su Valor y Preservar un Sistema Ecológico Saludable en el Río Bravo

- La riqueza y el valor económico en el mantenimiento saludable del Río Bravo, con un flujo adecuado de agua fresca a los estuarios, se debe reflejar en las políticas de desarrollo económico y de planeación para el abastecimiento de agua - es más, un buen plan de desarrollo económico aprovecha y promueve sus recursos naturales como un factor positivo en la calidad de vida;
- El efecto adverso que tienen las presas en la vida humana y silvestre debe considerarse cuando se evalúen alternativas para el abastecimiento de agua y su costo debe tomarse en cuenta como parte del análisis del costo y beneficio de alternativas.

Mejorar los Procesos de Planeación y Manejo del Agua

- El proceso de planeación y manejo de agua en la región fronteriza se puede mejorar mucho haciendo accesible al público la información sobre la demanda y el abastecimiento de agua en la región (especialmente en México) y por medio de la participación de entidades no-gubernamentales en dicho proceso. Los esfuerzos del Consejo de Desarrollo del Valle del Bajo Río Bravo en el planeamiento a largo plazo pueden servir de modelo para el planeamiento de agua de uso doméstico;

- Por otra parte México debería revivir el moribundo Consejo de Cuenca[24] del Río Bravo y reformar su estructura para incluír una verdadera participación ciudadana;
- Aunque se han visto mejoras en los últimos años, todavía existe la necesidad de un intercambio de información y de coordinación binacional - a nivel federal, estatal y local – en el planeación para el abastecimiento de agua en la Cuenca del Río Bravo.

I. El Proyecto del Agua Fronteriza y sus Colaboradores

El Centro de Estudios Políticos de Texas (TCPS) es un corganismo sin fines de lucro que provee asistencia técnica, de investigación y servicios de desarrollo de políticas, a comunidades y grupos de ciudadanos que trabajan por el interés público. Nuestro trabajo se basa en el principio de que las políticas de desarrollo económico deben integrar asuntos ambientales y sociales. Nuestros proyectos se llevan a cabo en asociación con ciudadanos y organizaciones comunitarias.

El Centro de Estudios Fronterizos y de Promoción de los Derechos Humanos (CEFPRODHAC) en Reynosa, Tamaulipas se fundado para trabajar en problemas ambientales y de derechos humanos en el noreste de México. El CEFPRODHAC ofrece apoyo educativo y técnico a las comunidades del área desde hace diez años, tomando parte y organizado diversas actividades. El Centro también estudia el impacto ambiental y social de la presa El Cuchillo construido sobre el Río San Juan.

La Clínica de Estudios de Derecho de la Universidad St. Mary provee una experiencia importante para los estudiantes de derecho al mismo tiempo que cumple con la misión fundamental de ofrecer asesoría y asistencia legal al público. La Clínica entrena a los estudiantes a la práctica de derecho por medio de la representación de clientes. A través de esta práctica, los estudiantes tienen la oportunidad de ofrecer sus servicios a las comunidades del sur de Texas.

La Coalición de la Cuenca del Rio Bravo es una organización sin fines de lucro dedicada al servicio de los ciudadanos que viven a lo largo de la cuenca. Esta organización, además de ofrecer información al público, sirve de organizador, y defensor en la preservación y el uso sustentable del Río Bravo, sus tributarios y otros sistemas naturales. La Coalición apoya a organizaciones locales mediante entrenamiento, desarrollo de proyectos, planeación y servicio de redes de comunicación.

El Proyecto sobre el agua fronteriza comenzó como un esfuerzo de estos grupos con el propósito de aumentar la participación de las comunidades locales binacionales en la planificación para el abastecimiento de agua en la zona central de la región fronteriza México/Texas, y de proveer un vehículo por medio del cual los agricultores, autoridades locales, organizaciones no-gubernamentales y ganaderos podrían reunirse y discutir temas referentes a la cantidad y calidad de agua de la región.

[24] La Ley Mexicana sobre el agua de 1994 estableció el Consejo de Cuenca, formado por agencias regulatorias y usuarios, para discutir y planificar sobre las futuras necesidades en el abastecimiento de agua. El único Consejo que funciona hasta ahora, es el de la región Lerma-Chapala cerca a la Ciudad de México.

Hubo tres factores principales que impulsaron el establecimiento de esta iniciativa.

Primero, los agricultores en el distrito de riego del Río San Juan cerca de Camargo, Tamaulipas sufrieron las concecuencias de la construcción de la presa El Cuchillo, construída para llevar agua a Monterrey. La construcción de esta presa disminuyó dramaticamente el abastecimiento de agua río abajo, agua usada por estos agricultores para el riego.

Segundo, en 1997 el Estado de Texas pasó la "Senate Bill 1 (SB1)," que establece que la planeación para el abastecimiento de agua en el estado se haga a un nivel regional, a través de comités. Estos se encargan de incluir a los representantes de organizaciones protectoras del medio ambiente, al igual que a ciudadanos locales, para analizar el desarrollo de los planes sobre el manejo del agua regional, proceso que ocurrirá el primero de septiembre del año 2000[25].

Tercero, la ciudad de Laredo anunció planes para la construcción de una presa hidroeléctrica lo que provocó inquietud en las comunidades ubicadas después esa población, desde Zapata. El Proyecto de agua fronteriza se inició para apoyar a los representantes de comunidades locales en los comités de la SB1, para promover estrategias sustentables para el abastecimiento de agua, y para compartir información con los ciudadanos.

II. Area que Cubre el Proyecto

La Cuenca del Río Bravo abarca 185.000 millas cuadradas donde residen 13 millones de habitantes[26]. La mitad de la Cuenca está en territorio de México, y la mayoría del agua que reciben las comunidades río abajo de El Paso y Juárez provienen de la Cuenca del Río Conchos en Chihuahua, México (ver figura 1). Este líquido disminuyó considerablemente en los últimos años debido principalmente a la falta de lluvias en el noreste de México. Otros tributarios del Rio Bravo son el Río San Rodrigo antes de Piedras Negras; el Río Salado cerca de Zapata y Ciudad Guerrero, el Río Alamo antes de Ciudad Mier, y el Río San Juan, en Camargo. Sin embargo estos tributarios, contribuyen muy poco al flujo del Río Bravo[27]. Del lado de Texas, los tributarios son los ríos Devil y Pecos, que ingresan al río después de la región de Big Bend y río,antes de Del Río, Texas.

Para las comunidades cercanas al plano costero (McAllen/Reynosa hasta Brownsville/Matamoros), el Río Bravo es la única fuente de agua para uso doméstico, para el riego y para el uso industrial, debido a la escasez de aguas subterráneas adecuadas. La ciudad de El Paso aumentó el uso de agua superficial ya que compró tierras aledañas a la ciudad, que contienen derechos a agua superficial. Ciudad Juárez, por su parte, trata de aumentar el uso de agua subterránea. En Laredo Texas y Nuevo Laredo Tamaulipas, el gran crecimiento de la población impulsa la búsqueda de nuevas fuentes para el abastecimiento en el futuro de agua. La

[25] Para mas información acerca del proceso de planeación estatal, visite la página web del Texas Water Development Board (http://www.twdb.state.tx.us).
[26] Información de La Coalición del Río Bravo/Río Grande
[27] "Flow of the Rio Grande and Related Data": US IBWC; Water Bulletin Number 65, 1995.

Ciudad de Laredo, por ejemplo, pagó por un estudio conducido por United State Geological Survey (USGS) para que examine la calidad del agua de los acuíferos, mediante el estudio de pozos existentes en tierras privadas en el condado de Webb.

Una historia de conflictos caracteriza las negociaciones sobre agua a lo largo de la Cuenca del Río Bravo. De acuerdo con los estudios, parece que sólo se llega a un acuerdo, cuando hay una crisis en el área de escasez de agua[28]. Hay varios factores, enumerados más adelante, que contribuyen a que se creen aún mas conflictos. Estos deben estudiarse para llegar a un acuerdo equitativo entre los usuarios de agua y para evitar mayores conflictos en el futuro.

Hay un número de situaciones preocupantes que llevaron al establecimiento de este proyecto. Primero, a la Ley de Derecho a la Extracción de Aguas (Right of Capture?) le pusieron el sobrenombre de la "ley de la bombeadora mas grande." Texas es el único estado del oeste donde todavía existe esta ley que permite que los propietarios de tierras extraigan cantidades ilimitadas del agua subterránea debajo de sus tierras, sin tomar en cuenta cómo se afecta a los vecinos que comparten el líquido y a la ecología y la viabilidad del acuífero a largo plazo[29]. Algunos legisladores y las autoridades relevantes al tema toman una actitud de "esperar a ver qué pasa," y esperan que el proceso regional de planeación para el abastecimiento de agua del SB1, que involucra a todos los interesados en el abastecimiento del agua, sea el que determine el destino de la Ley del Derecho a la Extracción de Agua, y al establecimiento de distritos de conservación de agua subterránea. Lo anterior limita la habilidad a corto plazo de los legisladores de regular el agua. Aunque el derecho al uso de agua - superficial y subterránea - es reconocido por la ley. Es injusto que algunas personas se beneficien enormemente de la venta de lo que es esencialmente un recurso público, especialmente cuando su escasez lo hace un recurso aún más valioso.

Primero, las comunidades a lo largo de la Cuenca del Río Bravo continúan proponiendo la construcción de presas sobre el Río Bravo y sus tributarios como una manera de "proporcionar" más agua para calmar la creciente demanda. Esta práctica es reconocida por muchas comunidades internacionales como dañina al medio ambiente, ya que tienen un impacto negativo en la vida acuática humana[30]. Sin embargo, a lo largo de la zona fronteriza México-Estados unidos las comunidades se encuentran bajo una contínua presión para satisfacer la necesidad de trabajo y de infraestructura de la creciente población. Aún la redistribución de agua -

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[28] Ver, por ejemplo, "Water Conflict in the Borderland," Borderlines, Julio 1999 (Interhemispheric Resource Center: www.irc_online.or).

[29] La Corte Suprema de Texas mantuvo la Ley "Right of Capture" en un caso entre dos propietarios y Ozarka – una compañía embotelladora de agua. Los propietarios se quejaron de que Ozarka usaba toda el agua del acuífero que comparten. La Corte Suprema le dejó la decision a los Legisladores de Texas. La minuta que proponía la formación de 22 distritos de agua subterránea adicionales en el estado, los cuales permitirían un control mas adecuado sobre el bombeo de aguas compartidas y restringiría la transferencia de agua fuera del distrito, no se aprobó durante la sesión de la legislatura de 1999. En su lugar se autorizó una minuta modificada donde se permite la formación temporal de distritos del agua y se prohíbe la restricción de transferencia de agua fuera de los distritos.

[30] Por ejemplo la Comisión Internacional de Presas (WCD), se estableció por el Banco Mundial y la Unión Internacional de la Conservación para estudiar los costos sociales, ambientales y económicos de las presas más grandes del mundo y evaluar alternativas y políticas relacionadas (para más información ver la página Web de la WCD: www.dams.ord/wcdwork.htm).

principalmente de uso agrícola a uso urbano - requiere que las municipalidades efectúen estudios acerca de las necesidades para el almacenamiento de agua, por lo que para algunas comunidades, la alternativa preferida continúa siendo la contrucción de presas.

Segundo, durante el proceso de planeación para el abastecimiento de agua en la frontera, fuera de la Comisión Internacional de Límites y Aguas (CILA) no hay una colaboración a nivel local o estatal entre los Estados Unidos y México. Algunas situaciones de carácter político causan que ésta cooperación sea extremadamente difícil. Sobre lo anterior la CILA tiene una autoridad limitada ya que se estableció solamente para administrar las presas internacionales, inspeccionar (vigilar) la frontera, e implementar proyectos estipulados en el Tratado de 1944. La agencia se adhirió a su papel, aún con la insistencia individual y de académicos para que ensanchara su campo para ayudar a tomar decisiones en la difícil tarea del manejo del agua binacional.

Tercero, como resultado del establecimiento de regiones y comités para el planeación del abastecimiento de agua en el estado de Texas bajo la SB1, Texas Water Development Board (TWDB) creó un proceso organizativo para asegurar que todos los usuarios de agua para uso agrícola, urbano, industrial y ambiental tengan voz en la mesa de negociaciones. Sin embargo los grupos establecidos durante este proceso no cumplen con esta tarea, invitando a participar solamente a agencias gubernamentales como la CILA y la Comisión Nacional del Agua, dejando sin voz a la población Mexicana. Asimismo, los estudios llevados a cabo durante el proceso de planeación sólo se enfocan al lado Estadounidense de la frontera.

Cuarto, las ONGs que insisten en la necesidad del uso de agua para la protección del ecológico, consideran que deben convertirse en “expertos” de la noche a la mañana para participar eficientemente en la mesa de negociaciones, mientras que otros miembros del comité tienen gran experiencia en el análisis de datos de uso del agua y en el manejo de sistemas de distribución. Una vez más el balance de poderes está a favor de los que tradicionalmente controlan el agua: en Texas, los distritos de riego, y en México, el Gobierno Federal.

III. Presentación de Informes

Durante la reunión en la Universidad St. Mary, los participantes compartieron los resultados de sus estudios y continuaron con discusiones. En esta sección se presenta un resúmen de las presentaciones. Los informes completos se encuentran en el Apéndice.

La Región Central del Río Bravo

Laura Pierce[31]
Coalición de la Cuenca del Río Bravo

Karen Chapman
Centro de Estudios Políticos de Texas

Como mencionamos anteriormente, el Proyecto sobre el Agua Fronteriza patrocinó varias reuniones regionales culminando con la reunión en la Universidad Santa María en donde se discutieron los temas siguientes:

Participación en el proceso de la Ley 1 del Senado (SB1)
Muchas de las autoridades encargadas de tomar decisiones acerca del manejo del agua no entienden completamente lo que significa la SB1 y las consecuencias que puede provocar. Algunos piensan que sólo es un plan sin futuro. Otros, que es un paso positivo para hacer más eficiente el proceso de obtención de permisos para la construcción de infraestructura de recursos hidráulicos, y para facilitar la recolección de fondos para dichos proyectos.

Otros expresaron preocupación porque la responsabilidad de tomar decisiones acerca del manejo y abastecimiento de agua se encuentra en manos de consultores privados y que la información que éstos generan es difícil de entender por parte de la población en general. Algunos ciudadanos que son parte del Comité de Planeación de la Región "M" y que han participado en las actividades patrocinadas por el Centro de Estudios Políticos de Texas mencionan que los residentes del Valle del Bajo Río Bravo (los Condados de Cameron, Hidalgo y Starr) tienen mayor representación en los Comités de la Región "M" y por lo tanto tienen mayor ventaja. El balance en la propiedad del agua se encuentra en manos del Distrito de Riego del Valle del Bajo Río Bravo, ya que las comunidades anteriores a la zona usan el agua primordialmente para necesidades municipales y no de riego. Los ganaderos de la parte central del Río Bravo generalmente utilizan agua subterránea para el ganado.

Participación e intercambio de informacion regional y transfronteriza
Otro de los temas que surgió en las discusiones fué sobre la falta de conocimiento de lo que sucede del lado mexicano del Río Bravo. Todos saben que esta corriente es un recurso natural compartido, pero a nivel estatal y local hay una profunda falta de cooperación e intercambio de

[31] Para más información ver el apéndice 2.

información transfronterizo, al menos en la información que debiera ser accesible a lapoblación. El conseso general es que debido a problemas en la operación de estructuras y de fondos, México no tiene datos adecuados con respecto al uso de agua, y que la poca información que existe, se encuentra en manos de la Comisión Nacional de Agua.

Otra razón por la que no existe cooperación entre las comunidades transfronterizas es que tienen diferentes preocupaciones. Por ejemplo, los agricultores en las comunidades Mexicanas ubicadas cerca de Ciudad Mier y Miguel Alemán, han estado inmersas en negociaciones legales acerca del agua del Río San Juan que están embalsadas en la presa El Cuchillo[32], mientras que los ganaderos del lado estadounidense, en los condados de Zapata y Webb se preocupan primordialmente por proteger su derecho a extraer agua subterránea y en algunos casos por apoyar experimentos para crear lluvias por medio de la inyección de químicos a las nubes. Con preocupaciones tan diferentes, la única manera de reunir a las comunidades Mexicana y Texana para discutir problemas comunes es a través de un esfuerzo que busque la comprensión y fijando planes de largo plazo. Como mínimo este esfuerzo debería promover un proceso por medio del cual los ciudadanos puedan hablar de sus problemas y explorar soluciones a los problemas de índole binacional.

Otro obstáculo que impide la cooperación con respecto a la conservación de agua entre las comunidades que se abastecen del rio es que las autoridades locales no están dispuestas a imponer medidas estrictas de conservación del agua especialmente si éstas "terminarán adelante en manos de otros usuarios." Los comités regionales de planeación ayudan a promover la cooperación entre comunidades para la planeación y manejo del agua. En otros lugares el intercambio de información entre grupos regionales ayudó a aumentar el entendimiento en asuntos relacionados con el agua. Sin embargo en cuanto al potencial para el desarrollo existe un ambiente de competencia y rivalidad entre las comunidades a lo largo del Río Bravo y respecto a las inversiones para la infraestructura y capital disponible.

Los participantes en la reunión del Proyecto del aguas binacional efectuado en Zapata, de acuerdo a sus áreas de interés se dividieron en grupos pequeños para discutir temas sobre el tratamiento a problemas sobre la tierra, políticas, y educativas. Al final del proceso cada grupo presentó lo siguiente: 1) un problema importante relacionado con el agua; 2) ideas de cómo una cooperación binacional puede o no, ser útil en el contexto de este problema; y 3) una acción o recomendación para resolver el problema y su implementación mediante un esfuerzo cooperativo.

[32] Ver en el apéndice 2 el informe del profesor Raul Sánchez: "México's El Cuchillo Dam Project: an Example of Why an Enforceable Human Right to a Healthy Environment is Needed" .

El siguiente recuadro representa los resultados de las discusiones entre los grupos.

	Manejo de Tierras	***Políticas***	***Educación***
Problema	Erosión y sedimentación acelerada causada por el manejo impropio de las presas	Protección del derecho a la calidad y cantidad del agua, población informada y soluciones legales apropiadas	Crear conciencia y educación a todos los niveles, con la participación de agencias ambientalistas
Cooperación Binacional	No están seguros de la forma de comenzar a fomentar la cooperación podría ser útil aprender de propietarios	La creación de una conciencia binacional puede llevar a una acción, pero la duda es cómo compartir la información	Efectuar contactos transfronterizos, reforzar el concepto de un río que une, no que divide a las comunidades
Acción o Recomendación	Reducir el arado de raíces, plantar especies nativas, hacer reuniones entre propietarios, autoridades, y representantes de agencias (NRCS)	Efectuar talleres acerca del proceso de certificación para obtener fondos del BANDAN para comunidades pequeñas, crear centros de información, organizar un congreso de ONGs para llegar a resoluciones conjuntas	Establecer una biblioteca o centros de información, en colaboración con autoridades municipales, distribución de trípticos, participación de maestros de todos los niveles

Cómo es evidente en este recuadro, se piensa que una cooperación binacional no traerá mucho más que el intercambio de información. Esto establece la necesidad de crear una mayor conciencia ciudadana acerca de la utilización del agua subterránea compartida, sobre el agua proveniente de tributarios de ambos lados de la frontera, y lo que afecta a los mismos. Acerca de los procesos de planeación que se realizan en ambos lados de la frontera que afectan a todos los usuarios del agua, y acerca del funcionamiento ecológico del río, como un sistema cuya protección depende de las políticas establecidas y llevadas a cabo en ambas naciones.

Mantenimiento de los flujos naturales

Los representantes de las organizaciones ambientales y de agencias que participan en el planeamiento para el abastecimiento de aguas dicen que es difícil cuantificar la cantidad de agua necesaria para el buén funcionamiento de un ecosistema, debido a la naturaleza dinámica y fluctuante de los ecosistemas. Esto dificulta que se llegue a acuerdos que requieran de números específicos. Agencias como la Texas Parks and Wildlife, las cuales están haciendo estudios acerca de la cantidad mínima de agua necesaria para el mantenimiento de bahías y estuarios en Texas, pueden estipular la cantidad mínima de agua necesaria para mantener los estuarios del Río Bravo; estos datos todavía no están disponibles.

Uno de los usos del agua en la preservación del mediambiente está siendo puesto en práctica por la U. S. Fish and Wildlife Service en el Valle del Bajo Río Bravo. Esta agencia tiene derecho a extraer 14,000 acres-pies de agua las cuales son usadas para regar habitats ribereños y humedales, importantes en la preservación de aves migratorias y aves en peligro de extinción. Entre otras cosas, este Servicio tiene como tarea la implementación de planes para asegurar la sobrevivencia de especies en peligro de extinción. El Proyecto Wildlife Corridor (Corredor de Fauna Silvestre), es uno de éstos esfuerzos de conservación de un hábitat; un proyecto que se encarga de comprar

tierras a lo largo del río y alrededor de ciudades para su restauración y preservación. Estas áreas y sus humedales correspondientes son muy importantes para preservar lo que queda de bosque y matorral nativo pues 95% se ha destruído debido al desarrollo de los últimos años. Estos bosques proveen ecosistemas para especies como el ocelote, varios tipos de anfibios,[33] y el calandria.

A nivel privado, la Asociación Nacional Audubon (National Audubon Society) preserva un santuario que no sólo es de valor histórico sino que sirve también de refugio para aves acuáticas. A nivel estatal, el Departamento de Parques y Vida Silvestre de Texas (Texas Parks and Wildlife) es propietario y maneja derechos de agua. Estas éreas se usan para la recreación y atraen hasta 100 millones de dólares anuales provenientes del ecoturismo. Sin embargo, la cantidad de agua usada para propósitos ambientales a lo largo del cauce principal del Río Bravo y sus humedales es de 25,000 acre-pies, que sólo representa el 0.2% del total del agua usada en el sistema. Aún más, no hay actualmente una cantidad de agua mínima estipulada para el mantenimiento de la vida acuática y silvestre del Río Bravo.

La disminución en la cantidad de agua en el Río Bravo provoca otros problemas además de la disminución de la calidad de un hábitat. Las plantas acuáticas hydrilla y jacinto han crecido en abundancia en partes del río, especialmente después de la presa Falcón, y han llegado a obstruir completamente el canal en algunas partes del río. El aumento en el flujo, en esta área del río, ayudaría a remover las plantas, pero debido a que el nivel del agua es altamente regulado y la cantidad de agua disponible es muy escasa, esto no es probable que pase. Texas Parks and Wildlife usa una máquina segadora para remover las plantas cuando éstas se convierten en un problema tan severo que los agricultores no pueden extraer agua del canal. El precio de esta limpieza tiene un costo de $100,000 a $150,000 dólares. Un vocero del Texas Parks and Wildlife declaró que estas plantas continuarán siendo un problema en el Río Bravo[34].

Presas

El agua que se transfiere una vez que se compra, se retiene en el sistema de transporte existente de agua. En otras palabras, cuando una municipalidad le compra agua a un distrito de riego, ésta paga por el uso de la infraestructura del distrito (para el almacenamiento del agua) y paga por los costos de electricidad durante el bombeo. De esta manera no se requiere infraestructura adicional. La construcción de presas es la primera opción que se considera cuando no hay espacio adecuado para el almacenamiento de agua. Lo ideal sería encontrar otras maneras de almacenarla pero no es una tarea fácil. Se está proponiendo la construcción de dos presas en el Rio Bravo para las ciudades de Laredo y Brownsville. Los residentes de la ciudad de Zapata, situada después de Laredo rumbo a la desembocadura del rio, están preocupados por los efectos que la presa pueda tener en el abastecimiento y la calidad del agua.

La mayoría de los residentes del área tienen diferentes opiniones acerca de la construcción de presas en el Río Bravo. Este informe se referirá repetidamente a los efectos perjudiciales de la presa El Cuchillo – una presa construída en el Río San Juan en Nuevo León, México con el propósito de satisfacer la demanda de la creciente población de la ciudad de Monterrey. El proyecto eliminó a un distrito de riego en Tamaulipas por completo y provocó graves tensiones

[33] Siren intermedia, un anfibio de agua dulce parecido a una anguila con agallas externas.
[34] Comunicación personal

entre ambos estados vecinos, entre entidades rurales y urbanas, y entre los interesados en el desarrollo urbano y la agricultura. Esta presa afectó otra situada en el estado de Tamaulipas, a la que le cortó el flujo de agua eliminando casi por completo las áreas de ecoturismo cercanas a la presa.

La Región del Bajo Río Bravo – El Plan Integral de Recursos Hidráulicos

Richard Hinojosa
Consejo de Desarrollo del Valle Bajo del Río Bravo
McAllen

El Consejo de Desarrollo del Valle Bajo del Río Bravo (Lower Rio Grande Valley Development Council, LRGVDC) representa a los condados de Cameron, Hidalgo y Willacy situados en el Valle Bajo del Río Bravo en el estado de Texas. A finales de la década de los setenta, los derechos para el uso de agua se dividieron o adjudicaron mediante un convenio legal, en donde estos derechos fueron divididos entre las ciudades y los distritos de riego. Esta decisión parecía justa en ese entonces, pero debido al alto crecimiento de la población, muchas ciudades experimentan en la actualidad escasez de agua. Estas poblaciones confrontan dos alternativas: comprar más agua o derecho a la misma, o entablar relaciones con los distritos de riego.

En el Valle Bajo del Río Bravo (VBRB), México proporciona el 95% del agua del río y del agua potable de la región, primordialmente proveniente de la cuenca del Río Conchos en Chihuahua. Este afluente cruza la región del Big Bend en el oeste de Texas y dsemboca en las presas Falcón y Amistad, que proveen 1.2 millones de acres-pie[35] (mapa) de agua anualmente a cerca de 1.2 millones de habitantes.

Desde 1995, la sequía ha hecho que los habitantes de la región del Valle Bajo del Río Bravo estén más concientes de los impactos que la disminución en el abastecimiento de agua puede provocar en la región. La cantidad de agua en la presa Falcón que le pertenece a los Estados Unidos bajó a un 19%, mientras que el agua perteneciente a México también disminuyó, pero se mantuvo cerca de un 26%. Debido a esta escasez, México eliminó el uso de agua para el riego, conservando el resto para uso urbano.

El impacto de la sequía fue severo: ciento sesenta millones de dólares en pérdidas de cultivos, cuarenta millones de ganado y la pérdida de uno de cada cinco trabajos en el sector agrícola. Los daños aun se resienten y no sólo en la agricultura del Valle. El otoño anterior no hubo suficiente agua para el riego y los agricultores no pidieron que se liberara agua de las presas. Cómo resultado, 15 de 28 distritos de riego no tuvieron suficiente líquido para abastecer las ciudades bajo su juridicción[36]. La escasez de agua impulsó a que se llevara a cabo un esfuerzo

[35] Un acre-pie = 1.233 metros cúbicos, o cantidad de agua necesaria para cubrir un acre cuadrado con un pie de agua de profundidad.
[36] Para clarificar este concepto: la ciudad de McAllen tiene cerca de 2,000 acres-pié de agua para uso municipal, pero no tienen un sistema de bombeo en el río para la trasportación. La ciudad tiene tres contratos diferentes con

multimillonario para tratar de resolver los problemas de abastecimiento de agua en la región. Las municipalidades, al igual que las compañías que manejan los recursos hidráulicos, los líderes locales, los distritos de riego, la Universidad Texas A&M y compañias de ingeniería fueron contratadas para efectuar los estudios. El resultado de este esfuerzo es el Plan Integral de Recursos Hidráulicos (the Integrated Water Resource Plan – or IWRP).

Conclusiones del Estudio[37]

El gran crecimiento en la población del Valle Bajo del Río Bravo aumentará la demanda de agua para usos urbanos. Sin embargo, a medida que las tierras agrícolas se conviertan en urbanas, la disminución del agua utilizada para el riego debiera compensar el aumento adicional necesario para las ciudades.

Se diseñó un plan de acción de diez años de duración en el cual se enumeran estrategias para la conservación de 400,000 acres-pie de agua por año, a un costo de $100 millones de dólares, o $250 por acre-pie de agua conservada. Esta es una inversión relativamente baja especialmente cuando se compara con otros sistemas en el estado. La responsabilidad de conservar el líquido corresponde primordialmente a los agricultores, aunque en el estudio mencionado anteriormente, parte de los costos para la conservación del agua serán pagados por las ciudades, que a su vez se beneficiarán de la que conserven. El agua se ahorrará a través de los mejoramientos de los sistemas de distribución de agua que resultará en la reducción de filtraciones y pérdida, el mejoramiento en los medidores, y otras tecnologías (como son riego por goteo).

IV. Discusiones del Panel

Los miembros del panel estuvieron de acuerdo en que el Plan Integral de Recursos Hidráulicos es uno de los esfuerzos más completos y cooperativos en el futuro en la documentación y planeación de las necesidades de agua. La discusión se centró en el papel que juegan las autoridades locales y México en el proceso de planificación. Una de las preocupaciones mencionada es que este proceso se basa en satisfacer las demandas futuras de agua debido al crecimiento en la población en vez de tratar un problema más importante como es el de limitar el crecimiento. Se hicieron varias preguntas para tratar de ver si las comunidades están pensando en el problema del crecimiento o si simplemente tratan de resolver el problema de futuras demandas en el suministro de agua en la región. Los panelistas estuvieron de acuerdo en que éste es uno de los mayores problemas en la planificación para el abastecimiento de agua y que para evitar que se tomen medidas sólo cuando existe una crisis, las comunidades necesitan empezar a integrar variables mas significativas en las discusiones de planeación.

El señor Hinojosa clarificó sus comentarios diciendo que este proceso descrito por él había comenzado aún antes que los regionales de planificación asignados bajo la Ley 1 del Senado

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varios distritos de riego para el bombeo y trasportación del agua que necesitan mediante un sistema ya existente de riego. Los contratos varían entre los distritos, y el costo es parte del costo del transporte de aguas.

[37] Ver Apéndice 2 para más información y presentaciones de la conferencia.

(SB1). El IWRP se está incorporando al proceso de planificador de la región "M", y lo componen representantes de varios sectores incluyendo grupos ambientalistas. Aunque no tienen voto, adicionalmente, se invita a participar a miembros del gobierno mexicano. Se planea efectuar la próxima reunión de la Región "M" en territorio de México.

El señor Hinojosa dijo que otros grupos han expuesto su preocupación acerca de la falta de interés en poner límites al crecimiento de la región. Dijo, sin embargo, que debido a que el proceso involucra a la comunidad y a todos los usuarios de agua, éstos tienen algún control sobre los temas que se discuten en dichas reuniones y que se deben tomar en cuenta para el planificación del abasto de agua en el futuro. Si se desea crecer o no y si se planifica este crecimiento o no, el factor limitante continuará siendo el agua. Las municipalidades, en otras palabras, no pueden simplemente usar el agua que están destinadas para la agricultura. Los propietarios de derechos tienen control sobre algunos de los aspectos en la planificación, y seguirán teniendo un papel importante en su distribución.

El "Desarrollo" Económico y el Agua

Otro problema discutido durante la reunión en la Universidad de Santa María es que el manejo de agua a nivel local ocurre en un marco restrictivo. Los encargados de promover el crecimiento en la región responsabilizan de encontrar agua a las compañías de servicios sanitarios y de agua potable, sin preguntarse siquiera sobre la disponibilidad de la misma. Al mismo tiempo, las autoridades encargadas de la administración del agua, que sí están conciente de la cantidad disponible en la región, no detienen la incesante demanda de más líquido. Estos dos grupos tienen pocos incentivos para cooperar bajo las condiciones actuales.

Hubo gran preocupación acerca de la forma en que la industrialización en ambos lados de la frontera provoca una situación donde las necesidades de los otros usuarios de agua serán relegadas a un segundo plano, aún con las buenas intenciones que se puedan tener durante el proceso planificador. Uno de los miembros del panel mencionó que el Consejo de Desarrollo Económico de McAllen (sobre el que recae una enorme responsabilidad por el crecimiento de la industria maquiladora en Reynosa) invierte millones de dólares promocionando agua gratis para las maquiladoras que se establezcan en la región, sin tomar en cuenta el costo de esta acción. En la revista "Borderlines" del mes de julio donde se discuten conflictos fronterizos con respecto al agua, se cita un ejemplo demostrativo de la disparidad en la distribución de agua, donde una maquiladora en Piedras Negras usa una cantidad exhorbitante en la producción de pantalones. El ingeniero de planta expresó que esta maquiladora nunca ha tenido problemas por insuficiencia de agua. Por otro lado, una colonia vecina no ha conseguido que las autoridades provean suficiente agua potable para sus residentes[38].

Existen otras consecuencias negativas si se persiste en perpetuar a la industria como la fuente estratégica principal en el crecimiento económico, pues se crean presiones en los patrones de población, con un aumento desproporcionado en regiones donde existen más fuentes de trabajo debido a estas empresas. Esto al mismo tiempo, crea necesidades desproporcionadas que tienen qué absorberse por los ciudadanos (taxpayers) que ya sufren por la escasez de agua.

[38] "Water Conflicts in the Borderlands", Borderlines, Julio 1999; I Coronado & G. Korous, IRC.

Algunos panelistas piensan que el proceso de planificador para el abastecimiento de agua en México, que se hace a través del Consejo de Cuenca, no es un proceso en colaboración, sino mas bien uno que asigna los derechos de agua. Los panelistas afirman que nuevos sucesos, especialmente con respecto a las presas El Cuchillo y las Blancas[39] parecen indicar que el factor más importante en la asignación de agua será la expansión urbano/industrial. Aún con los bajos salarios que pagan y con los daños que causan al medio ambiente, la industria maquiladora y otras empresas similares, representan una respuesta atractiva para las miles de personas que buscan trabajo para subsistir y para las comunidades que tratan de beneficiarse del crecimiento.

Colaboración Binacional

Se discutieron temas de cooperación y colaboración binacional y las posibilidades de conflictos en la frontera y a lo largo de la Cuenca del Rio Bravo con respecto a la distribución de agua. Varios panelistas piensan que a pesar de que muchas comunidades hablan de las "ciudades hermanas," los Estados Unidos y México no son buenos vecinos cuando se refieren a colaboración. Se concluyó que tienen qué efectuarse cambios en México – en el sistema político, la cultura legal, la necesidad de una decentralización realista y no sólo en papel – antes de que pueda impulsarse una colaboración binacional eficiente. Como ejemplo, en 1972 se agregó la minuta 242 al Tratado de 1944 de la Comisión Internacional de Aguas Fronterizas (IBWC) que regula el agua transfronteriza. Básicamente esta minuta es un acuerdo donde a través del IBWC, los estados fronterizos Mexico/Estadounidense negociarían el manejo del agua subterránea; desde entonces nada se ha hecho al respecto.

La Función de las ONGs y el Marco Legal

Los participantes estuvieron de acuerdo en que las organizaciones no-gubernamentales (ONGs) en México cuentan con muy pocos fondos y se les hace difícil que se les oiga durante las negociaciones. Hubo desacuerdo en cuanto al éxito obtenido por las ONGs en lograr cambios significativos en México. Se comentó que en los Estados Unidos, el litigio es un arma poderosa usada para llegar a acuerdos; esto no ocurre en México, debido quizá a la falta de fondos. Varios participantes expresaron que el gobierno no atiende a las ONGs mientras que éstas no representen una amenaza. Un panelista expresó que sólo habrá un cambio real cuando las ONGs tomen más poder mediante la formación de coaliciones o mediante el uso de herramientas legales. Este argumentó, asimismo, que hay resistencia , probablemente debido a la escasez de fondos, de pasar por el procedimiento de fortalecer el sistema legal. Concluyó diciendo que las ONGs mexicanas tienen qué atravesar por el mismo proceso evolutivo que las ONG estadounidenses para llegar al punto donde puedan utilizar las herramientas legales en su poder para que los escuchen durante el proceso de toma de decisiones.

[39] La presa Las Blancas va a ser construida sobre el Río Alamo en el Estado de Tamaulipas para recuperar el agua que fueron perdidas debido a la construcción de la presa El Cuchillo. Las Blancas la planificaron y se construye sin ninguna participación pública.

Una de las formas por la que las ONGs mexicanas podrían comenzar este proceso es a través de la Comisión para la Cooperación Ambiental (CCA)[40]. Después de un inicio lento, hay esperanzas de que esta institución abra algunas puertas que ayuden a fomentar cambios.

Los participantes estuvieron de acuerdo en que las ONGs mexicanas y estadounidenses deben trabajar en conjunto para expandir sus funciones dentro del proceso de toma de decisiones de las agencias binacionales. Otros panelistas dijeron que aunque el Consejo de Cuencas mexicano aún no realiza acciones específicas, las ONGs tienen todavía la oportunidad de ser parte de este proceso ya que juegan un papel importante para enriquecer el debate y en el intercambio de información. Las ONGs promueven nuevos conceptos e ideas en la mesa, resultado de su interacción con la comunidad. Estas ideas son indispensable y deben tomarse en cuenta durante el proceso de toma de decisiones para que cualquier acuerdo pueda tener éxito a largo plazo.

Algunos panelistas fueron de la opinión de que las organizaciones de medio ambiente y las de derechos humanos debieran estar más conectadas. Dijeron que las organizaciones de derechos humanos en México y a través del mundo han tenido éxito, especialmente con organizaciones internacionales, al llevar a primera plana temas concernientes a los derechos humanos. Mientras que en México, en los últimos diez años, se registran grandes movimientos en favor de los derechos humanos, el gobierno mexicano no muestra ninguna política ecológica significativa; la falta de entusiasmo durante la iniciación del Consejo de Cuenca demuestra esta indiferencia. El derecho al agua potable, aire limpio y un ambiente sano deben considerarse como derechos humanos básicos al igual que tienen qué ver con el medio ambiente en general.

Otros panelistas expusieron que se deben educar a las ciudades hermanas de la zona fronteriza y a lo largo de la cuenca a que consideren seriamente todas las preguntas que se exponen en reuniones como esta. La educación es necesaria y ya se reconoce que cuando el poder se concentra en pocas manos, estos no tienen ningún incentivo en escuchar a nadie más. En este caso, los que tienen el poder financiero son los que controlan el futuro del agua. Los panelistas recomendaron que cuando se reúnan los que abogan por el desarrollo económico, no sólo discutan este tema sino que intenten encontrar formas para resolver problemas como la escasez de agua y la contaminación en la región.

Estos problemas se manifestaron en el famoso caso de la presa El Cuchillo en Tamaulipas, México. Representantes del Distrito de Riego 026, cerca de Ciudad Camargo, expresaron que el acuerdo histórico con el gobierno, firmado en 1906, acordó que cada uno de los 11 distritos de riego recibirían una cantidad estipulada de agua para el riego de cultivos. Con el tiempo y la expansión urbana, el gobierno intentó cambiarlo con un acuerdo realizado en noviembre de 1998, que rehusaron firmar cinco de los once distritos. Este acuerdo se elaboró posteriormente de que la presa El Cuchillo[41] se construyó en el Río San Juan, la que cortó el flujo de agua y que tradicionalmente se utilizaba por los distritos de riego. Asimismo, eliminó las operaciones de varias empresas de turismo que operaban cerca de la presa Marte R. Gómez. Los distritos no fueron consultados para la construcción de esta presa ni formaron parte de las negociaciones.

[40] La CCA se estableció para servir de mediador, en temas pertinentes a comercio y ambiente, entre los países que forman parte del Tratado de Libre Comercio – Canadá, Estados Unidos y México.

[41] La Presa El Cuchillo es discutida más delante de manera detallada en el informe del Profesor Sánchez.

El distrito de riego 026 sometió todas las demandas legales necesarias, y ha estado promoviendo activamente este caso en los Estados Unidos en cualquier grupo dispuesto a oírlos. Después de un largo y arduo camino lleno de incidentes, incluyendo las críticas mutuas entre el Gobernador de Tamaulipas y el de Nuevo León, la renuncia del Gobernador de Nuevo León, protestas públicas en ambos estados y decisiones tomadas por la Comisión Nacional de Agua, los afectados por la presa todavía no reciben una compensanción adecuada. El distrito también trató de presentar los hechos al comité de planeación de la Región "M" pero sin éxito, debido a que se les negó esta oportunidad por razones diplomáticas. Además, como se mencionó anteriormente, la SB1 no incluye una discusión binacional ni intenta establecer las necesidades futuras en el abastecimiento de agua en México.

V. Informes Adicionales

La Cuenca del Río Colorado y Comparación con la Cuenca del Río Bravo[42]

Michael Cohen
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El Instituto del Pacífico es un centro independiente, sin fines de lucro creado hace 12 años para la investigación y el análisis de políticas en las áreas del medio ambiente, de desarrollo sustentable y de seguridad internacional. La base fundamental para el trabajo del Instituto es el entendimiento de que la pobreza a nivel global, la degradación ambiental y los conflictos políticos están fundamentalmente relacionados y deben estudiarse de manera interdisciplinaria.

El Instituto del Pacífico ha producido un gran número de publicaciones incluyendo un informe acerca del uso sustentable del agua en California y en la Cuenca del Río Colorado. El informe "Success Stories"[43] describe un número de diferentes estrategias que han tomado las comunidades y agricultores y que han ayudado a reducir el consumo de agua aún con el crecimiento de la población. Entre las estrategias que podrían ser de mayor importancia para las autoridades encargadas de los recursos hidráulicos en Cuenca del Río Bravo están: 1) las soluciones más efectivas en el manejo del agua motiva a que personas con metas diferentes trabajen juntas para alcanzar un objetivo común; 2) cualquier tipo de reglamentación es mejor que no hacerlo – en otras palabras, las reglamentaciones juegan un papel importante ya que no sólo describen los criterios que se deben seguir, sino que también ayuda a que éstos se cumplan; 3) las innovaciones económicas impulsan cambios - el tasamiento?????? y el ofrecimiento de incentivos para la inversion pueden ayudar a la adopción de nuevas tecnologías; 4) mientras los usuarios de agua tengan más información acerca de su utilización y de las opciones disponibles, éstos podrán tomar mejores decisiones.

[42] Vea Apéndice 2 para más información.
[43] Para obtener copias de este informe vea el apéndice donde se encuentra la dirección del Instituto del Pacífico.

Las cuencas del Río Colorado y del Río Bravo tienen cierta semejanza: ambas son semejantes en tamaño, los dos ríos surten agua a México (aunque no hay un componente binacional en el manejo de las aguas del río Colorado), y los dos son fuente de agua en regiones áridas. Hay instituciones similares que juegan un papel importante en la región del río Colorado, como lo son el IBWC, el BANDAN, la COCEF (BECC) y el Bureau de Reclamaciones, etc.

Una de las diferencias entre los dos ríos es que aunque el área geográfica que comprende el cauce principal del río Colorado es de sólo el 2% de la longitud del Río Bravo, el Colorado lleva en su cauce seis veces más aguas que el Río Bravo. Al mismo tiempo, el nivel del agua acumulada en las presas a lo largo del río Colorado no disminuye de manera tan dramática como la del Río Bravo. De hecho, provoca alarma cuando el nivel de las aguas en las presas del Colorado se reducen a un 80% , mientras que en el Río Bravo, durante el verano de 1998, los niveles de agua en las presas bajaron a un 19%. Desde la construcción de la presa Hoover, nunca hay habido una escasez de agua en la cuenca del río Colorado – los propietarios de derechos siempre reciben la cantidad de agua correspondiente, y en el caso de California, aún más de lo estipulado. Sin embargo, debido al alto crecimiento de la población en las Vegas (hasta 1000 personas se establecen en las Vegas cada semana), en el sur de Nevada y en el sur de California, es muy posible que ocurra una redistribución de aguas.

Cumpliendo con las obligaciones de un tratado, México recibe 1.5 millones de acre-pie de agua anualmente del río Colorado para usarse primordialmente para el riego en el Valle de Mexicali y para usos municipales en las ciudades de Mexicali y San Luis Rio Colorado. También se transporta agua a Tijuana y a Ensenada. México no participa en las discusiones referentes al manejo y operación del agua en el río Colorado, en temas como descarga de excesos, (lo que provoca inundaciones en México), la restauración del Salton Sea, la determinación de criterios en el manejo de excedente de agua, las regulaciones pertinentes a los derechos de agua, y el posible impacto del revestimiento del canal All-American. Aún más, el Plan de Conservación de Especies Múltiples del Bajo Colorado (Lower Colorado Multi Species Conservation Plan) no incluye en su programa a México o a la región del Delta lo que causó la renuncia de representantes ambientalistas en protesta por esta medida.

A pesar de la falta de colaboración binacional en el pasado, se han hecho algunos esfuerzos: la ciudad de Mexicali y la Agencia de Protección al Ambiente (EPA) de los Estados Unidos participaron en la construcción de una planta de tratamiento de aguas residuales que reciclará agua para utilizarse después por la ciudad. Asimismo, el IBWC y la CILA han hecho esfuerzos conjuntos para buscar la solución de problemas pertinentes a la calidad del agua, y la Agencia de los Recursos Hidráulicos del Condado de San Diego ha entablado conversaciones con agencias mexicanas sobre el proyecto de transportación de agua del río Colorado.

Se puede ver también la colaboración binacional a nivel de ONGs, el cual es un proceso lento pero que trae resultados positivos. Quince ONGs estadounidenses y mexicanas participaron recientemente en un taller en la ciudad de Tucson, Arizona para desarrollar una serie de reglas pertinentes a la restauración del Delta del Rio Colorado; éstas se comprometieron a trabajar conjuntamente. Este grupo espera convertirse un vehículo de comunicación entre las

organizaciones mexicanas y las autoridades estadounidenses a cargo del funcionamiento del río Colorado, especialmente en temas relacionados con los efectos que tiene en el sur de la frontera las decisiones que se toman con respecto a las aguas de este río.

Modelos de Acuerdos Binacionales

Dr. Alberto Székely
Ciudad de México

El Dr. Székely describió brevemente un documento llamado el tratado Bellagio sobre agua subterránea transfronteriza. El Dr. Székely, un abogado de interés público, participó en las negociaciones de este tratado cuyo propósito es el establecimiento de un marco para un protocolo comprensible para el manejo del agua subterránea transfronteriza. El tratado, elaborado en 1989, exige que se cree una nueva institución internacional que se encargue de recopilar y mantener información y de elaborar planes de manejos para los acuíferos transfronterizos compartidos por las dos naciones; o que se hagan cambios en los mandatos de la IBWC para que permita dicha actividad[44]. Las negociaciones comenzaron con el propósito de examinar no sólo los problemas actuales a lo largo de la región fronteriza entre México y los Estados Unidos, sino de las acciones que han provocado la situación actual, y cómo éstas podrían afectar el futuro de la región. El objetivo primordial fué el de desarrollar una "diplomacia preventiva" – tratando de evadir conflictos por medio de la planificación de procesos y acciones antes de que la situación llegue a ser una crisis.

Uno de los objetivos de estas negociaciones fué el de difundir las herramientas legales disponibles, que junto con los tratados y acuerdos existentes ayudan a que las negociaciones no empiecen de cero. Los resultados de estas negociaciones se plasmaron en el Tratado de Bellagio – que servirá de modelo para futuras negociaciones.

También se habló de los recursos petroleros a lo largo del país y de la necesidad de un balance entre la utilización de este recurso y el impacto ambiental que causa la extracción y explotación del petróleo. Uno de los resultados de estas discusiones fué el Borrador de Puerto Vallarta (Puerto Vallarta Draft), el cual es usado hoy en día.

Se mencionó otro acuerdo internacional, el Borrador Ixtapa, diseñado para limitar la cantidad de agua bombeada en los acuíferos Hueco-Bolson y Trinity-Edwards situados en el oeste y centro de Texas y los estados norteños mexicanos correspondientes.

El Convenio del 1996 de las Naciones Unidas referente al Manejo de Ríos Internacionales también se diseñó para imponer límites a la extracción de agua. Los Estados Unidos y México, además de muchos otros países no firmaron este convenio, pensando que tenían los sistemas adecuados para enfrentar sus propios problemas y llegar a un punto de equilibrio ecológico.

[44] Challenges in the Binational Management of Water Resources in the Río Grande/Río Bravo; D. Eaton & D. Hurlbut, 1992.

Una de las claves para el éxito de estos acuerdos es la voluntad de los gobiernos participantes de tratar de resolver problemas que tienen un impacto ambienta len ambos lados de la frontera. Esta voluntad no ha estado presente, pero la gravedad de la situación actual llevará a ambos países a una situación donde las negociaciones no serán voluntarias sino necesarias para mantener la estabilidad de la región.

El Manejo y Abastecimiento de Agua en México

Profesor Ismael Aguilar Barajas[45]
Instituto Tecnológico de Estudios Superiores de Monterrey – ITESM
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Estudios recientes acerca del manejo de los recursos hidráulicos en México han concluido lo siguiente:

- El agua es y seguirá siendo un factor limitante para el crecimiento y el desarrollo
- Los precios del agua necesitan reestructurarse – los precios actuales no reflejan el verdadero valor del agua
- La Comisión Nacional del Agua (CNA) tiene un papel limitado en la negociaciones binacionales, pero debiera participar en discusiones sobre el desarrollo económico
- El financiamiento para mejorar la tecnología en el almacenamiento y transportación de agua se relaciona con el precio del líquido pero también requiere de clarificaciones acerca de los derechos de agua.
- Los responsables del manejo de recursos hidráulicos deben ser profesionales en el área.
- Debe existir claridad y responsabilidad en el manejo de las finanzas relacionadas con los usos del agua – especialmente con respecto a los precios de la misma.
- En México debe haber una política acerca del manejo del agua durante las sequías.

La cuenca del Bajo Río Bravo tiene una importancia crucial para México. El agua de esta cuenca es de vital importancia para la economía de la región con respecto al comercio internacional, así como para actividades agrícolas e industriales.

No hay un entendimiento general de esta importante región. Los resultados de estudios recientes muestran que el uso del agua en el Bajo Río Bravo no es sustentable. Los estudios muestran que existe preocupación por su continuo uso inadecuado, la dependencia en el manejo del agua desde el punto de vista de abastecimiento, la infraestructura, los patrones de proceso de producción (al igual que de consumo), las necesidades de agua para el ecosistema del río mismo, y la estructura financiera al igual que el marco institucional, legal y político necesario para mantener la calidad del agua. Este estudio da a conocer preocupaciones realistas acerca de la sustentabilidad social y de los recursos hidráulicos de la región.

[45] Ver Apéndice 2 donde se encuentra el informe completo.

Además de los problemas de abastecimiento, mencionados anteriormente, la región confronta asimismo presiones sociales por la demanda. La tasa de crecimiento actual y proyectada para el área metropolitana de Monterrey crea una situación preocupante con respecto a la sustentabilidad a largo plazo. La meta es tratar de encontrar un balance entre el uso actual del agua disponible y la necesidad de encontrar nuevas fuentes de agua. Cuando la demanda es mayor que la oferta, debe haber un proceso de manejo de demandas que permita el balance entre el uso de agua, y la que hay disponible. Por lo tanto, se debe prestar atender el control de la demanda, antes de considerar opciones para abastecimientos adicionales de agua.

APPENDIX 1

- Project Contacts/Contactos
- Project Meetings/Reuniones del Proyecto
- Participants/Participantes

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Border Water Project Meetings

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September 24, 1998
Zapata, Texas

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APPENDIX 2

- Presentation Papers/Ponencias

Interviews from Webb and Zapata Counties and Nuevo Laredo Region – Local Opinions of Water Supply Issues

Laura Pierce, Rio Grande/ Rio Bravo Basin Coalition
May 1999

This report was prepared for the Texas Center for Policy Studies for the conference "Water Supply Alternatives and Avenues for International and Regional Cooperation," to be held at St. Mary's University May 28 and 29, 1999. The report was generated from sixteen informal interviews conducted in Webb and Zapata Counties in Texas and in Nuevo Laredo, Tamaulipas, to help determine what residents think are the most important water supply problems in the region and how these might be resolved through cross-border cooperation. The sixteen interviewees included city and county officials, agricultural extension agents, federal agency representatives, local environmental activists, ranchers, and academics. A list of respondents is attached, along with a list of the main interview questions.

Key Issue: Water Quantity Vs. Quality

The interviewees were asked to name the single most important issue that should be addressed with regard to shared U.S./ Mexico water. Replies were fairly evenly split between quality and quantity issues, but a majority (most of whom were water providers or responsible for water management) named both quantity and quality as essential. In terms of water quality, specific concerns were topsoil erosion and runoff which contributes to sediment-loading from private lands (based on responses from Texas A&M Extension Service's Community Futures Forum); transportation of hazardous materials; siting of new infrastructure such as the Laredo bridge above the city's water intake and lack of city planning; higher solids and choliform count due to lowered water levels; required treatment plants for individual industries/ maquiladoras with increasing industrialization; and raw sewage and other discharges from Nuevo Laredo. In Nuevo Laredo, representatives with the municipal Comision de Agua Potable, or COMAPA (Potable Water Commission) say connecting people to sewage is their priority. They have connected about 75% of the city to sewage treatment so far and are currently trying to identify funding to connect some remaining 17% (their target is 92%) to a new treatment plant. A Mexican federal government representative interviewed thinks the sewage connection problem will be resolved relatively quickly.

In terms of water quantity issues, a common theme was agriculture use, allocation, or seeming "wastefulness," (cited by four respondents). Others voiced a concern about water use by agricultural producers when asked about municipal vs. agricultural use (see section below). Some believe that better technology and water-saving techniques for irrigation are needed. Others suggested that agriculture needs to change to other types of crops that are less irrigation-intensive and use better technology to save water for cities. A Mexican academic stated that there must be an economic shift to industry such as that which has located so far in Nuevo Laredo that does not require large quantities of water.

Some Zapata County respondents think that the Watermaster could do a better job in managing water in the reservoirs and say "no" to farmers when their use puts upstream areas in danger, which one respondent says happened last year when Falcon Reservoir got down to a level of 6 inches[46].

There were various other issues and ideas related to water quantity. A county utility representative stated that the most important issue is to improve relations with counterparts in Mexico and IBWC/CILA, to then get their water models together to "work off the same model" and bring in all parties in the basin, including New Mexico and Colorado. The respondent further stated that Mexico constructed dams on the Río Conchos because the Pecos was dammed and that even within Mexico the actions of one state hurt the others. Some respondents said that the U.S. and Mexico need to work together because, for example, if there are no conservation measures in Mexico, there is no incentive for people on the U.S. side to conserve if the water will just be used downstream. Another respondent stated that the key issue is to allocate water rights equitably and to offer incentives that encourage recycling and conservation. For example, companies like Central Power and Light should get credit for putting clean water back in the river. The respondent went on to say that user groups should be prioritized; moving golf courses, for example, to the bottom of the list. CILA will be focusing on promoting water reuse for industries, and will be doing a study of the border's *empresas de agua*, (public.private water utilities) citing that in Nuevo Laredo, leaks in COMAPA's water pipes result in the loss of 40% of their water.

Cross-Border Exchange

When asked about current opportunities for cross-border meeting venues to discuss water supply and other natural resources, most respondents had a difficult time thinking of any. Besides the efforts of the Rio Grande/ Río Bravo Basin Coalition and Texas Center for Policy Studies, one respondent listed several other initiatives: the Water Environment Association and the Texas Section of the American Waterworks Association has an EPA grant to provide training to Mexican operators that began in 1995. In addition, there is a binational effort underway through the Texas Water Utilities Association, and there are other non-technical meetings, such as the Transboundary Cooperation Conference organized by LBJ School at UT Austin. The Texas A&M Agricultural Extension Service organizes Rancho Reforma on an annual basis, which brings together ranchers to share ideas, using the Integrated Range Resource Management approach. The Service also works with individual farmers and the Associacion de Ganaderos and a wildlife association in Nuevo Laredo. The Senate Bill 1 Region M planning group[47] invites participation from CILA and state of Tamaulipas representatives. Another respondent referred to a binational effort in Los Dos Laredos headed by Dr. Hector Farias, a U.S. Customs broker, to address transportation issues. Finally, CILA/ IBWC organizes annual training for communities to respond to flooding.

[46] *Ed. note*: official figures from the IBWC put the estimate at 18% of U.S. conservation storage.

[47] Under Senate Bill 1, Texas was divided into basin-wide or inter-basin regions for the purpose of planning how future water supplies would be met. The executive planning committees consist of a cross-section of water owners and user groups throughout the region.

Most of the respondents believed that more cross-border meetings would be beneficial. Specific suggestions that people had for technical training were pesticide use and conservation measures, capacity building for city and state, and best water management practices between large and small municipalities. However, a few people had some concerns about the effectiveness of these meetings. Some said that unfortunately, many of these meetings or discussions involving both sides - especially regarding raw sewage dumping - were fruitless or became politicized because of a "tit-for-tat" relationship between the countries. A respondent from the academic community said that he also has seen very little accomplished on a binational level and feels that the International Boundary and Water Commision's authority needs to be expanded or a river authority created. Another problem enumerated is that, while the Lower Rio Grande Valley Development Council has meetings that involve Mexicans, there is no equivalent to the Council on the Mexican side. Efforts by the Texas Water Development Board and Texas Natural Resource Conservation Commission to address the problem of hydrilla in the Lower Rio Grande Valley involve CILA and the Comision Nacional de Agua. However, while representatives from CILA/CNA have a voice and can present their views at these meetings, they do not have a formal vote. Another problem in Mexico is that many decisions are made in Mexico City, whereas in the U.S., states have more power. Two of the Mexican respondents are hopeful that the newly created Consejo de Cuenca in Monterrey will have public forums, but in terms of current binational negotiations, there is no institutionalized mechanism, or equivalent to the Consejo[48], for bringing the two countries to the table.

Information On Water Availability

The general consensus regarding the availability of information for people to understand the limitations of the water supply was that it does exist but it is difficult to find. Also, when it is put out to the public, it's not done in the correct way. Several respondants stated that as long as water is coming out of the tap, people are unaware that there is a problem. Both Laredo and Nuevo Laredo utilities representatives said that they are planning to implement conservation education programs to change the "culture of water use." Many respondents believe that focusing on teaching children is the key.

Specific ideas for how to present water supply and use information included having a roving water education trailer and a permanent grant funded position in water outreach as part of an on-going effort; publishing information in the paper on a daily basis; providing water availability charts to subdivision developers and implementing a sliding price scale for water use - i.e., the more you use, the more you pay; providing more effective enforcement and a TIPS line; and providing practical advice for water users. One respondent differentiated between information for the general public and information for decision makers, who need more scientific proof so that there can be agreement on the nature of the problem and the solutions.

[48] *Ed. note*: Although the Senate Bill 1 regional planning committees do allow for public input from Mexico, and invite Mexican government representation at the meetings, there is no basin-wide process for participation.

Dams

The interviewees were asked their opinion of the proposed dam to capture more water for Los Dos Laredos. Six of the 16 respondents interviewed said it was not a good solution. The reasons given were that the amount of water available is still limited and that evaporation in the area was too high. Four respondents - primarily municipal water utility providers, believe that the dam is definitely beneficial. Five respondents felt that dams definitely have benefits such as preventing floods and severe droughts, but they were uncertain as to whether it would be a good idea for the Laredo area. Four recognized that it could have negative impacts on downstream communities. Two respondents said they are willing to consider a low-level dam if it is used to provide a recreational and economic resource (through tourism) for the community, which would require it being moved to the center of the city from the proposed site upstream of the city. One of these respondents also qualified his support by stating that it would have to pass "environmental muster" with a full assesment, but stated that the ecosystem in the area is already "trashed." Another possible benefit they cited would be more difficulty in accessing the area by illegal immigrants, which would reduce the need for additional Border Patrol activity and military intervention that might potentially further damage the ecosystem.

Alternatives To Dams

When asked about feasible alternatives to dams, respondants mentioned groundwater, aquifer injection, cloudseeding, desalinization, and interbasin transfers, though there were limitations listed for these alternatives. Groundwater is considered expensive because it requires reverse osmosis. Two respondents did not consider groundwater an option, but another viewed it as a back-up source. Three others are uncertain of its potential. In Nuevo Laredo, according to one respondent, the people say the groundwater is bad, but apparently the city is considering mixing the groundwater with river water to clean it. The concern cited here was that the salt may find its way into the river, which would be dangerous for water quality. According to one utility provider interviewed, they still need to know the recharge zones of the aquifer to be able to calculate the amount in the "Laredo Sands" and the Carrizo-Wilcox. This same respondent thinks there is a connection between the river and aquifers; Amistad was built in 1969 and by 1972 San Felipe springs started flowing again, seeming to indicate some recharge of the aquifer[49].

The Aquifer Storage and Recovery process, or aquifer injection, is another possibility mentioned. A major concern related to this option is that the water, once injected, might migrate into adjacent areas and face potential contamination - this possibility was mentioned by four respondents. In order to determine the feasibility of underground aquifer injection, according to one respondent a geological study is needed which would cost $100 million, a very expensive option, especially for Mexico. A possible location mentioned for aquifer injection on the U.S. side is Crystal City's Cometa outcrop.

[49] *Ed. note*: The San Felipe Springs had previously flowed but flows did increase after the construction of Amistad.

As for cloudseeding, only one respondent said it was worthwhile. Four respondents, including two ag/ranching interest representatives, consider it wasteful or are doubtful about its potential. Desalinization of seawater was considered too expensive to be feasible by most; however, a respondent from Zapata County said Corpus Christi is undertaking a study of desalinization and plans to include 11 counties in the study, using aquifer injection as the preferred means of storage. For purposes of the study, Zapata might join with Falfurrias and follow Corpus's lead. There are, according to this respondent, lots of existing canals that could be used for water transport. Another respondent thinks that small reservoirs and other means of capturing water need to be explored. Four others emphasized education and conservation as critical, and two felt that population growth needs to be limited in the area.

Municipal Vs. Agricultural Needs

When asked whether municipal needs or agricultural needs for water should take precedence, most respondents found it difficult to decide. The respondents involved in ranching in the area emphasized that people have to have food, but they do not need golf courses and lawns for survival. Two respondents stated that currently agriculture in the Lower Rio Grande Valley uses too much water. One respondent said that municipal users should take precedence. According to him the crucial issue is the way water is allocated by the Watermaster; right now there is no incentive for upstream municipal utilities to conserve water because it will only benefit growers downstream. He thinks it should be mandated that the Watermaster regulate or enforce conservation at that end. Another respondent suggested that Region M municipalities should buy water rights through a process to make valley irrigation districts conserve, creating a bank to administer the transfer of water acreage and ensuring that it is a mechanism that will benefit everyone. Three others also stated that agricultural producers need to employ better conservation practices. Yet another respondent stated that if the region reaches the point that municipal needs aren't being met, they would really be in trouble because municipalities only use 10% of the water. A related perceived problem is that Laredo owns more water rights than it uses[50].

Right Of Capture

When U.S. respondents were asked whether they believed that keeping the "right of capture" law in place is in the best long-term interests of the region, most were unfamiliar with the exact nature of "right of capture," so the interviewer explained the basic concept to them[51]. As one rancher stated, "right of capture" is good for ranchers because it provides economic stability; however, it "created the Chihuahuan Desert." Other respondents involved in ranching said that it is necessary for them to create stock tanks, which also benefit wildlife, help recharge aquifers, and prevent erosion, but several respondents (including one landowner) said that perhaps "right of capture" should be regulated to some degree. Another respondent emphasized that right now there is very

[50] *Ed. note*: Current studies show Laredo actually uses more water than it owns.

[51] *Ed. note*: Right of capture applies principally to groundwater. However, under Texas law, prior appropriated riparian rights allow private landowners to appropriate waters from streams running through their property for small-scale livestock watering, or stock tanks.

little incentive for farmers and ranchers to stay in business, and one had to be careful which policies are promoted that might further restrict their economic freedom. For a municipality, "right of capture" is a tough question. A benefit is that the city can buy water from private owners, but a negative aspect is that the water can be sold to any entity and thus exported out of the region. According to this same respondent, if the state controlled water it would be an artificial boost or drag on municipal growth; the state would essentially decide who grows. Two others emphsized the interconnectedness of surface water and groundwater, and although they weren't familiar with all of the legal aspects, questioned the logic of "right of capture."

Sustainability Of Current Growth

When asked whether the level of growth in the region is sustainable, there was much disagreement among the interviewees. Seven respondents (from quite varied backgrounds) felt strongly that it is not sustainable in their region. Three others, including two urban respondents, believe that it is sustainable - in terms of water - if agriculture, which uses 89% of water in the area, can incorporate more efficient water-saving technology. A municipal utilities representative stated that he would be willing to pay for the infrastructure to make agricultural users more efficient if he received the water saved for use by the city. Two respondents stated that there must also be conservation measures promoted among all inhabitants of the region.

Regardless of sustainability, the high cost of groundwater was also a barrier to growth, according to one respondent. According to another respondent from the rural area of San Ygnacio, the population of that community is stable, but there is some concern about the impact of Laredo's growth on their water quality. An agricultural representative said that the creation of subdivisions means that there is less agricultural land in use now, which is problematic. Some think that infrastructure development lags in the region. However, COMAPA representatives in Nuevo Laredo say they are making plans for new water treatment plants that will serve developing areas to the north of the city. One respondent said that even if the population doubles, water quantity would not be a major problem and that if adequate water treatment plants are constructed, eventually water quality will not be a problem. He stated that industry has caused problems but the government (Mexican) is now being more vigilant. This respondent also stated that urban run-off is an issue that has not been discussed, and which needs to be examined more closely in terms of its impacts on water quality.

Economic Growth And Quality Of Life

The interviewees were asked whether they believed economic growth will lead to a greater quality of life. Four responded that it depends. If additional revenue is spent on community projects, it will improve quality of life. One respondent said everyone has a different opinion about what quality of life means; he personally would like to see more cultural events in Laredo, while another said it depends on the type of jobs that are created. Others felt that the type of economic growth experienced in the region is not leading to a greater quality of life for these reasons: a large number of jobs are minimum wage; only a few residents are gaining in real income; public expenditures are barely

keeping up with the population growth; there is no environmental price attached to the cost of doing business; maquilas do not provide the benefits they could and are subject to the volatile global market; and high-volume truck traffic in Laredo decreases quality of life. Three of those interviewed believe that economic growth will lead to greater quality of life in this region. A Mexican respondent said that there are differences between Mexico and the U.S.; the U.S. has cleaner cities because it has greater access to wealth. Mexico has a lot of problems to confront - employment, illiteracy, etc. Corruption is a problem because people have trouble believing in the government.

Assistance To Local Communities

Most respondents believed that local communities could benefit from outside assistance. The types of assistance listed as potentially of interest were: access to information about water; financial support and institutional mechanisms for infrastructure (four respondents); public education and awareness (three); grants, idea sharing between cities, and university research; infrastructure or safety-oriented projects to alleviate environmental and health impact of trucks, such as air emissions, congestion and potential for hazardous waste spills; technology transfer; policy advice and leadership; job creation; technical assistance for cities; technology exchange for agriculture; education about recycling; technology and resources to do Environmental Impact Statements to ensure the sustainability of projects (in Mexico specifically); and the promotion of wildlife, birding, and heritage tourism. A few people saw problems with outside assistance, saying that grants were often wasted, and a Mexican respondent felt that sometimes there were strings attached by the funder, which in Mexico has often been the U.S. government.

Interviewees

Webb County
Fernando Román
Director
Utilities Department

María Eugenia Guerra
Publisher
LareDOS

Manuel "Guero" Benavides
G. Benavides Co.

Dr. James Earhart
Rio Grande International Study Center
Laredo Community College

Dr. Tom Vaughan
Texas A&M International University

Tomás Rodríguez
Webb County Utilities

George Gonzales
Texas A&M Ag Extension Service

Flavio Garza
USDA Natural Resources Conservation Service

Zapata County
Jose Oscar Dodier
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Comision Municipal de Agua Potable y Alcantarillado (COMAPA)

Ing. Ernesto Valdez Vázquez
Comision Municipal de Agua Potable y Alcantarillado (COMAPA)

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Lessons from the Colorado River Basin

Michael Cohen
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Pacific Institute for Studies in Development, Environment and Security
April 1999

I hope to contribute to today's panel discussion some of the lessons we have learned from our studies in the Colorado River basin, broadly in the perspective of river management and more specifically from those issues I have been working on in the context of Salton Sea and Colorado River delta restoration. The Colorado basin is characterized more by conflict than collaboration, especially at the inter-state level, though recent efforts at the grassroots level provide a source of optimism. The Colorado Basin also offers recent examples of efforts to augment the supply of deliverable water, primarily through management rather than the construction of new infrastructure. I also hope to be able to contribute to today's discussions the importance of demand-side management, which should be a prominent component of any plan to address the chronic water shortages in the lower Rio Grande/Rio Bravo region.

First, allow me to provide a little background. The Pacific Institute for Studies in Development, Environment, and Security is an independent, non-profit center in Oakland, California, created in 1987 to do research and policy analysis in the areas of environment, sustainable development, and international security. Underlying all of the Institute's work is the recognition that the pressing problems of environmental degradation, regional and global poverty, and political tension and conflict are fundamentally interrelated, and that long-term solutions must consider these problems in an interdisciplinary manner. The Institute's mission is to conduct and distribute meaningful and usable research and policy suggestions on the interactions among these issues. The organization seeks to produce quality, impartial research and to make sure it is accessible not only to public and private-sector decision-makers, but also to community groups and the public at large. The ultimate objective of the Pacific Institute's work is to contribute to equitable and sound development, the reversal of environmental degradation, and regional and international peace and security.

In recent years the Pacific Institute has published several publications relevant to today's discussion, including *California Water 2020: A Sustainable Vision* (1995), *The Sustainable Use of Water in the Lower Colorado River Basin* (1996), *Sustainable Use of Water: California Success Stories* (1999), and *Haven or Hazard: The Ecology and Future of the Salton Sea* (1999). *California Water 2020* challenges the underlying, supply-side projections of the California Department of Water Resources, offering instead a long-term, sustainable vision of water use for California. The recent *Success Stories* report offers 28 examples of individuals, organizations, and agencies that have worked to reduce consumptive use of water and restore degraded environmental areas, ranging from the implementation of more efficient irrigation practices to the restoration of urban streams. The Colorado River report describes the physical and institutional context of the river and provides a series of recommendations for improving patterns of water use, allocation, and management in the basin that can continue to support

economic prosperity while maintaining ecological integrity. *Haven or Hazard* assesses the on-going federal-state effort to restore the Salton Sea and offers a set of principles and recommendations to improve the restoration process. I am also currently working on a couple of projects relating to the basin: a comprehensive delta region water balance and an assessment of the Bureau of Reclamation's proposed surplus flow criteria for the management of the river.

There are a variety of similarities and differences between the Colorado and Rio Grande basins (see map 2). The differences between the basins are perhaps more readily apparent. The Colorado River limitrophe, separating Baja California Norte and Arizona, is only 38 kilometers long, less than two percent of the length of the Rio Grande/Rio Bravo limitrophe. The Colorado River limitrophe also differs conceptually from the Rio Grande/Rio Bravo, in that it is viewed more as a delivery point for Colorado River water rather than as a shared resource to be managed jointly.

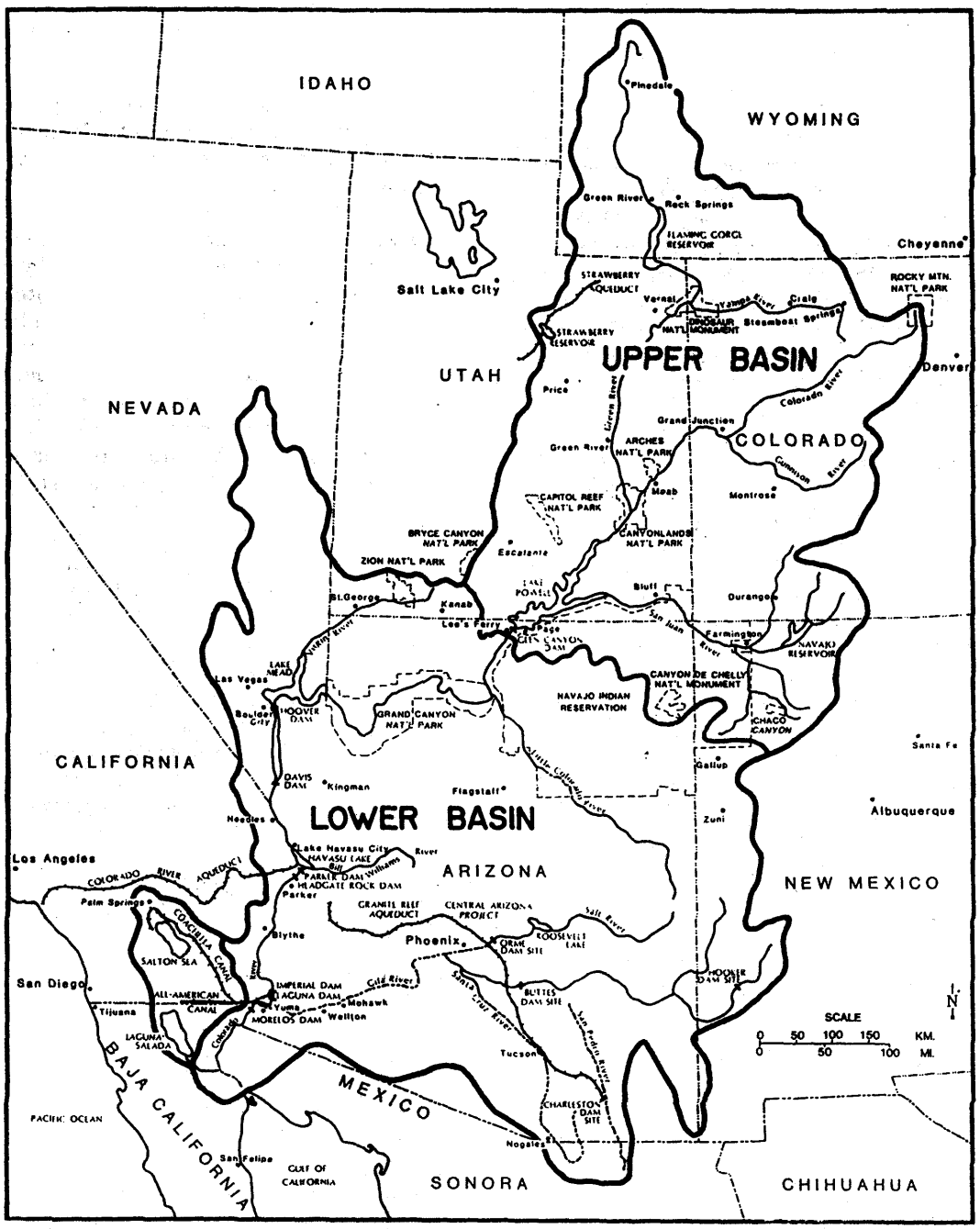
The drainage basins of the two rivers are roughly equivalent in size, but the Colorado River carries 5-6 times more water than the Rio Grande/Rio Bravo. Due to a complex set of institutional arrangements, since Hoover Dam was completed in 1935, there has never been a water shortage on the lower Colorado River. Additionally, the Law of the River suggests that the likelihood of a "shortage" in the lower basin is extremely low; the burden of drought years will be borne disproportionately by the upper basin states. Storage capacity on the Colorado River system is roughly 60 million acre-feet (maf), four times the average annual river flow, assuring lower basin users that they will continue to receive their allocations even in the event of sustained drought in the basin.[52]

Under the 1944 treaty allocating the waters of the Colorado, Rio Grande/Rio Bravo, and Tijuana rivers, Mexico's treaty entitlement to Colorado River water is a first priority right. Mexico is virtually assured of continuing to receive her treaty entitlement of 1.5 maf/year (with an additional 0.2 maf/year in surplus years), though in future years this will likely prove increasingly inadequate to meet the growing demands of Mexicali and Tijuana, much less the ecological needs of the desiccated Colorado River delta region. At times of extraordinary drought, the U.S. may reduce deliveries to Mexico proportionate to reductions made in the U.S.

There are several similarities between the basins. Both are subject to the 1944 US-Mexico treaty, both are critical sources of consumptive water use in extremely arid regions, providing water for millions of people and large expanses of agricultural land, as well as critical environmental habitat, and both have more demands upon them than the river carries in a normal year. Several of the same institutional players are active in both regions as well, especially at the international level: IBWC, NADBank, BEC, as well as the Bureau of Reclamation and CNA.

Although the Colorado River basin is characterized by a marked lack of collaboration, examples of collaboration do exist. These include the participation of the U.S. EPA in the financing and construction of the wastewater treatment plant in Mexicali, and on-going discussions, at the level of IBWC-CILA, regarding dredging/sediment removal from the Colorado River channel just

[52] See *Water Resources Bulletin* vol. 31 no. 5 (1995).



Map 2: The Colorado River Basin

above Morelos Dam. The IBWC and CILA also sponsored a collaborative report on water quality in the lower Colorado and New rivers, suggesting better monitoring, exchange of information, and implementation of best management practices to address water quality concerns in these two rivers. Additionally, the San Diego County Water Authority is currently engaged in discussions with several Mexican agencies to convey, store and potentially treat Colorado River water, via a canal through Mexico. From a personal perspective, one of the most encouraging recent developments in the basin occurred just last week in Tucson, when representatives from ten Mexican and U.S. NGOs agreed upon a common set of general principles regarding the restoration of the Colorado River delta and pledged to work together.

The history of the Colorado River basin is a history of competition and conflict.[53] Arizona has taken California to the Supreme Court on four separate occasions regarding allocation of Colorado River water; the longest of these cases lasted twelve years. Animosity continues to characterize negotiations regarding allocations of Colorado River water, within and between states. The counselor to the Secretary of the Interior has attempted to mediate on-going negotiations between agricultural districts in California, and between agricultural and urban water distributors, with only limited success. Mexico in particular is often excluded from discussions regarding the management and operation of the Colorado River, on topics such as the release of excess storage waters (which has created flooding in Mexico), the restoration of the Salton Sea, determination of surplus flow criteria, regulations regarding off-stream water banking, and potential impacts of the lining of the All-American canal. The failure to include Mexico and the Colorado River delta region within the scope of the on-going Lower Colorado River Multi-Species Conservation Plan (LCR MSCP) was one of the reasons that representatives from the environmental community resigned in protest from the LCR MSCP Steering Committee.

The Colorado River, one of the most impounded and strictly managed rivers in the world, also offers a variety of examples of non-structural methods of augmenting the supply of available water. Alternatives to the construction of additional dams and physical infrastructure on the Colorado River include rural-urban transfers, water-banking and off-stream banking, and demand-side management programs. The Imperial Irrigation District, in south-eastern California, has entered into water transfer agreements with two southern California urban water districts, to transfer a total of more than 300,000 af/year of conserved water. The State of Nevada is also pursuing the legal authority to allow it to store part of its unused Colorado River apportionment in Arizona aquifers. The environmental impacts of these actions, especially on the Colorado River delta region, are potentially severe.

A variety of demand-side management programs have been adopted throughout the state of California, as discussed in *Success Stories*, from household-level conservation measures through groundwater banking, resulting in potential water savings of as much as 2 maf/year. Another demand-side measure is Arizona's groundwater management act, which requires a long-term

[53] See, for example: Norris Hundley, jr., 1966, *Dividing the Waters: A Century of Controversy Between the United States and Mexico*, Los Angeles: Univ. of Calif. Press; David H. Getches, 1985, Competing Demands for the Colorado River, *Univ. of Colorado L. Rev.* 56: 413-479; Gary D. Weatherford and F. Lee Brown (eds.), 1986, *New Courses for the Colorado River*, Albuquerque: Univ. of New Mexico Press; and Marc Reisner, 1993, *Cadillac Desert: The American West and its Disappearing Water*, NY: Penguin Books.

guaranteed supply of water for new construction. A variety of other "smart growth" plans also pertain to the question of addressing future water demands in the region; while clearly not sufficient in themselves, they can provide a useful piece of the puzzle.

In summary, the Colorado River basin may represent an example of what to avoid for those seeking avenues of improving binational collaboration in the Rio Grande/Rio Bravo basin. Partly because of the very limited Colorado River limitrophe, Mexico is seen by U.S. water users and local agencies as an obligation that needs to be satisfied, rather than as a legitimate partner in the management of the Colorado River. However, recent efforts by Mexican and U.S. NGOs to work together on the restoration of the Colorado River delta do provide a source of optimism. Additionally, the variety and successes of demand-side management programs in the Colorado River basin could provide a model for similar programs in the Rio Grande/Rio Bravo basin.

Water Rights and Management in Mexico[54]

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Submitted to TCPS September 1999

The Lower Rio Bravo basin is of crucial significance for Mexico. In terms of international trade, as well as industrial and agricultural activities, this resource is vital to the health of the regional economy.

In spite of its significance, a comprehensive understanding of the region is lacking. Available research shows that the current pattern of water use in the Lower Rio Bravo is not sustainable. Research has shown concerns about the sustainability of the continued wasteful use of water, of the continued reliance on supply-side water management, of infrastructure, of observed patterns in the production process (as well as of consumption), of the water needs of the river ecosystem itself, of the financial structure as well as the institutional, legal and political frameworks needed to maintain reasonably good water quality. While this research is perhaps too much concerned with the scenario of 'business as usual,' it does present realistic concerns about water and social sustainability.

In addition to the supply-side problems listed above, the region also faces demand-side pressures. The current and projected future rate-of-growth in the metropolitan area of Monterrey raises fundamental questions about long-term sustainability. The challenge is to find a proper balance between the careful use of existing volumes and the need for new sources of water. When demand grows faster than supply, demand management is required to bring water use into balance with supply. Therefore, more attention should be given to the control of the demand side, before considering any other options for additional water supply.

Though it is rarely addressed in this context, water quality is also a major factor affecting the availability of drinking water. The explosive economic and population growth already mentioned not only requires more water, but also degrades the quality of existing supplies. Untreated discharges from all users—domestic, industry, commerce, and agriculture—pollute sources of fresh water. There is also a tendency to expand existing water supply without adequate attention to sewer or sanitation infrastructure, which cannot handle the increased wastewater created by expansion.

To make matters more complicated a great many of the changes required to meet these supply-and-demand problems will fall outside the sphere of influence of traditional water authorities. The changes required to meet rising demand would involve cases of changing production processes in industry; modifying agricultural practices; financing water infrastructure; the enforcement of water law; and the attraction of national or foreign direct investment. No Mexican water authority can stimulate these changes alone.

[54] Translated by Brandon Vegter, TCPS intern

At the very least, closer consultation among government agencies would have to occur. The continuation of isolated programs—where agriculture, industry, commerce and service activities, federal interests, and local concerns each follow their own way—is contributing to the array of problems that are deeply rooted in the current water system. It has been said (all too often) that a holistic approach to water management is needed, one in which water is recognized as a scarce economic good.

It is not surprising; then, that the overall complexities found in the Lower Rio Bravo basin do not seem to be matched by official policy responses. Current state development plans for both states—Tamaulipas and Nuevo Leon—show the inconsistencies between problems and responses, even though some strategies may address the links between urbanization/industrialization and the environment, for instance.

The Tamaulipas 1993-1999 development plan is a case in point. While the plan stresses a concern with increasing economic and population growth and their consequences in widening the gap between demand and supply of water infrastructure, its approach to solving these challenges is poorly defined. There is an insufficient diagnosis of the problems, and thus there is no mention of coherent objectives, strategies, or actions designed to solve these problems. Water is not mentioned at all. Water pollution appears under lines of action; however, policy attention is focussed on only the most affected basins and on reuse (with the intention to fulfill international standards).

Nuevo Leon's development plan follows the same lines. The one-page diagnosis that is presented is very limited indeed. The diagnosis is far from reflecting the true complexities involved in managing water in the Monterrey metropolitan area. There is no mention at all about the conflicts with Tamaulipas over the waters from El Cuchillo, although this is implicitly addressed in the policy section. It is not surprising then that water strategies are so ill defined. For any practical use, the plan does not, and could not, guide water decision making. The expectation would be for the Monterrey Water Authority to do so, though this appears not to be the case either.

Though it is of utmost importance to complete a registry of water users, this task has not been completed. According to the 1995-2000 Water Plan, it should already have been completed for the entire country. As in many areas of Mexico, many water users in the Rio Bravo region have not registered their rights. It is obvious that this situation—the lack of a water-use registry—prevents the collection of more revenues, and also highlights the need for more effective enforcement mechanisms.

By its very nature, addressing the water problems along the Mexican border falls within the binational sphere. In fact, the Border XXI program—in discussing water problems along the Tamaulipas-Texas border—has called attention to the need for a binational plan for the basin.

Estimates from the National Water Commission, contained in the Border XXI program, show that financing is perhaps the major bottleneck of water planning in the Bajo Rio Bravo region. A 1996 report pointed out that water infrastructure for the lower part of the basin would require around

U.S. $120 million dollars between 1996 and the year 2000 (31 percent for sewage, 29 percent for drinking water, 9 percent for increasing efficiency). This figure represents 27 percent of the requirements for the entire Mexican border region. These requirements also contrast sharply with the 0.7 percent oriented toward research and project studies.

Water pricing reflects another bottleneck for creating more comprehensive water policies. The impaired pricing system currently in use does not provide incentive for more efficient water use. Social and political considerations in Mexico prevent the setting of a price near to the real opportunity cost of water. As a result, prices are kept considerably low, especially for agriculture.

Fostering water markets is one solution to these financial bottlenecks. With water's growing scarcity, the importance of water markets may also become more crucial. The major point here becomes whether water rights transfer between agriculture and the cities. For example, an agreement between Monterrey and several farmers of the 026 Irrigation District (who are already involved in legal battle) could be reached over the waters of El Cuchillo. Monterrey could retain these waters for its population and economic activities as long as a fair compensation package is mounted.

However, despite the apparent theoretical attractiveness of water markets, there are also some legitimate concerns. There are relatively few examples of well-performing water markets—and of transfers from low value agriculture to high value urban activities. Water markets do not develop overnight or without cost. In short, only *appropriately designed* water markets can aid effectively in the allocation of scarce water among competing sectors.

Nor do these problems appear to be solved by private sector financing. In fact, the future financing of private infrastructure faces hard challenges. Private sector financing implies the introduction and/or strengthened participation of private sector banks upon the creditworthiness of state and local governments. In turn, this requires a deep restructuring in the finances of local water boards. This is a Herculean task and one, which has little promise as Mexico, recovers from its latest banking crisis.

To make matters more complicated, most urban water authorities do not collect enough revenue to cover current expenses. Nor do they plan for future investments. This presents a problem as the region undergoes rapid urbanization. Urbanization exposes the shortcomings in both policy design and implementation. The pace of population growth is outgrowing urban planning. Therefore, irregular (an often illegal) housing developments becomes established in places not delineated as housing areas in urban development plans. Very often, it is hard to provide water to these areas. Also, these settlements usually consider water availability as given, and most are not aware of the need to consult water authorities. Once politics sets in, it becomes even more difficult to cope with water supply, and regardless of the quantity or quality of water used by these settlements, politicization results in legitimizing the claim of these irregular human settlements to water resources. The outcome results in areas where the provision of water/sewage services becomes difficult, or where there are not even plans for water services at all.

Decentralization of government functions at the local level may also be seen as a solution to the financial bottlenecks. Undoubtedly, local actors are in better position to know what the problems are, and to advance some of the most likely solutions. They are nearer to the problems than central offices in Mexico City, from which desk plans are usually drafted and imposed on local communities.

Yet decentralizing the administration of infrastructure (as the responsibility of state and local authorities) is unlikely to solve water management problems. Various issues are at stake here. The following question is the central one: Is local provision more cost-effective than national provision? In answering this question, attention must be paid to economies of scale and (above all) to economies of scope. The latter means that central water authorities tend to have far more advantages than local authorities in terms of financing, technology, human resources, long-term vision, and research and development. Transfer of responsibilities to local authorities, therefore, should take into account the differences in these capabilities.

Another major concern with the decentralization of government functions is precisely financial capabilities. The resources of most sub-national water authorities are not enough to finance their own expenditures. The case of Monterrey's metropolitan area illustrates that even a large and relatively rich water authority is in no position to entirely finance the provision of water services without the aid of Mexico City. This fact is hard to accept (and even to acknowledge) at the local level, given Nuevo Leon's resentment that the state does not receive fair treatment from the federal government.

As a result, some public policies are performed more effectively by national governments, which can better handle the externalities involved in providing services to a large number of people. In the case of water systems, factors such as human migration, capital mobility, and the mobility of tax bases are highly related to water and fiscal policies. Controlling for these factors cannot be done without a plan that extends across metropolitan areas, states, and even regions. The transfer of water to the Monterrey metropolitan area from El Cuchillo and the return of treated waters to Tamaulipas illustrate this concern very neatly.

Thus, it is clear that in the years to come, a reexamination of the appropriate sub-national fiscal government structure will be a prominent issue on both the research and policy agendas. This research must focus on the *establishment* of institutions and the *choice* of fiscal policies, rather than the traditional emphasis on the *effects* of those institutions and policies. In this context, the growing number of studies on fiscal federalism in Mexico is welcome. Recent estimates suggest that over 90 percent of states' current income come from federal transfers. Contrary to expectations, this level of dependence has increased since 1980, as well as the concentration of revenue at the level of the federal government. Although there have been some improvements in revenue design and collection, there still exists a great deal of discretion in federal expenditures; the history of water supply to Monterrey also illustrates this discretion nicely.

There is a need, therefore, for a new fiscal pact between the different levels of government. So far this policy, regardless of the say of states and municipalities, has been drafted in Mexico City offices while ignoring the lower levels of government. Given its wide external effects, the

decentralization of responsibilities to users in the Lower Rio Bravo is far from simple. It is not surprising that delays have occurred in the proper operation of the Rio Bravo Council. Officially established in 1994, it has been largely ineffective in solving the region's problems. Therefore, it has just been re-launched in strict correspondence with the complexities created by its wide external effects. The Rio San Juan Council Basin, a sub-council of the Rio Bravo basin, suffers from similar external effects as well.

The experience obtained so far indicates that the provision of water infrastructure is a highly technical affair, which involves large amounts of money, with vast and wide-reaching implications. Few local authorities would be in the position to face and address these challenges, without federal government involvement. By the same token, the knowledge of local actors is an essential component in tackling these problems. Thus, an integrated plan among local, state, and federal governments is required for the successful devolution of water policy.

Once this policy is addressed, the capabilities of water institutions have to be strengthened. The scale and complexity of water problems along the region of the Lower Rio Grande/Rio Bravo basin between the U.S. and Mexico surpass the role of CILA, which has already done a great deal of work in handling them. Research has made it clear that the two sections of the Commission do not have the capabilities to address the whole set of issues under consideration. There are so many actors involved that—especially on the Mexican side—achieving an agreed water policy has been almost impossible. In any case, as would occur in other spheres of the institutional agenda, there are always chances to reassess the role of the Commission.

At the national level, the National Water Commission also has limits to both formulate and (above all) to implement water policies. For instance, the weak enforcement of environmental standards on water discharges provides an example of the limited capabilities that CNA has to effectively operate water management in Mexico.

Perhaps one of the major limitations for better water management in Mexico is the low record of policy enforcement. As occurs in other nations, integrated water management in Mexico rests upon a wide spectrum of legal attributions and technical standards. Because of an insufficiently developed legal framework and insufficient information, vested interests are able to inhibit the application of the law. The conflicts over El Cuchillo demonstrate this. The agreements signed in 1996 between the states of Nuevo Leon and Tamaulipas with the federal government contained actions that for the most part have been extremely difficult to implement.

The experience of the Lower Rio Bravo basin also suggests the need to reassess the role and function of the basin councils. The basin councils date back to the 1975 National Water Plan, and were landed in the 1992 National Water Law. In spite of the fact that the Rio Bravo council was one of the first councils to be established nationwide (in 1994), it wasn't until the beginning of 1999 that a re-launch of the institution took place. In 1995, it was argued that the drought tested the effectiveness of the Rio Bravo Basin Council. The participation and interest of several actors—such as farmers—was marginal. In addition, some years later the crisis over El Cuchillo waters demonstrated the failure of the council altogether. As a result of this conflict, the establishment of the San Juan River sub-basin Council was proposed to address this crisis. So far,

the combined contribution of both these entities to solving local problems is negligible. Nationwide, it is being recognized that the original aims of the basin councils were too optimistic. Locally, the disputes over El Cuchillo waters underline the conflicts between different basin councils.

It may well be that a reassessment of the basin as a political unit (for water management) would have to be done. For instance the latest regionalization of the National Water Commission is basin oriented. This makes sense from the natural point of view, but not necessarily from the political perspective. In the previous scheme, entire states made up CNA regions. The northern zone was made up of Chihuahua, Coahuila, Nuevo Leon, and Tamaulipas. The headquarters were in Torreon, in the state of Coahuila. In the new scheme, the Rio Bravo belongs to Region VI (northern border), which partially covers the states of Sonora (with a very small share), Chihuahua, Coahuila, Nuevo Leon, and Tamaulipas. The headquarters have been relocated to Monterrey, capital of Nuevo Leon.

International experience shows that basin-based water management is successful if the following conditions are considered: national circumstances and capacities, sufficient resources (including autonomous income), clear mandates, and sufficient legal faculties. The story that has been constructed for the Lower Rio Bravo would not give much room for optimism. Overall, the problem of basin boundaries that may cross several individual jurisdictions remains. As expressed elsewhere, however, it is not clear as to which administrative structure would be the most appropriate for the water management initiative.

It is clear, therefore, that the sustainability of water resources in the region cannot be addressed with a partitioned perspective. It requires a truly multidisciplinary and binational approach. Within this framework, it becomes easier to stress that water management in the binational Lower Rio Grande/Rio Bravo basin requires joint management. It also requires the study of surface and ground water, the consideration of quantity and quality of the resource, the internalization of externalities, and more secure and stable water rights. It is clear that scarce water inhibits development, and that actions proper planning should take the place of reactions to crises. There is also a need for increased cooperation, efficiency, and for strengthened institutional mechanisms.

Policy Recommendations

Increase the knowledge about the water system

It is of fundamental importance to better understand how the water system works. Under current circumstances, it is not possible to make well-informed decisions for the long term. In spite of its limitations, this report on water use in the Lower Rio Bravo aids in understanding the overall complexities involved, highlights some of the major bottlenecks, identifies the major players, and proposes some policy actions. It is firmly believed that neither locally nor in Mexico City are there an awareness of how complex the problem is, and how much knowledge is needed to run water services more properly. Therefore, there is certainly the urgent need for more research about the functioning of the water system, and also the need to understand how existing knowledge could help support current decision-making.

Permanent and comprehensive monitoring and evaluation

There is also the need for a permanent evaluation system (where appropriate before, during, and after the lifetime of the projects). Central in this evaluation is the establishment of an information system for each one of the major components of the water system, and an integrated one for the entire Lower Rio Bravo region. It has become common for local water boards or irrigation districts to prepare reports that inform about their activities, and it is also common that both the quantity and quality of information in these reports is far from desirable to use for sound decision-making. Therefore, a more comprehensive monitoring and evaluation process needs to be put in place to aid in coherent policymaking.

Strengthen water management

A central (and natural) recommendation is the improvement of water management. One of the most important recommendations is to achieve more coordination among agencies with direct and indirect responsibility for water. Cooperation, however, must be real and not just written on paper, as appears in almost all programs where there are explicit references of water management. In fact, it is extremely striking that while agencies like CNA or PROFEPA try to apply normative water policies on a wide set of issues, other agencies like SECOFI try to evade these actions and advance towards greater deregulation. Obviously, the net effect of this conflict undermines water quality. This is a call for better accountability among agencies, as well as a sharing of responsibilities and the development of better information about water management. A worthwhile exercise is to derive—for the country as a whole—the experiences of CILA in addressing conflicts over water management. The role of CILA itself could even be reassessed.

Establish a permanent, long-term program to handle droughts

The Lower Rio Bravo basin is a dry region, where severe droughts are a recurrent event. It is striking, therefore, that during every drought improvisation sets in. Different measures to handle droughts have been proposed in the past. These include reuse of water, reductions of losses, imposing sanctions on those wasting water, denying government support to firms that do not pursue efficient water use, and to reduce direct evaporation and evapotransipiration in dams, among other measures. However, few of these measures have been coherently put in practice during drought crises. Of particular significance is the issue of institutional reform. In fact, as shown in CEPAL, the creation of the first water management institutions was a direct response to situations of scarcity. This recommendation would require the integration of dispersed actions conducted by different agencies to be harmonized in a single program.

Mexico's El Cuchillo Dam Project: "Development" at the Expense of a Healthy Environment[55]

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At the busy international border between the U.S. and Mexico--which not only marks where the territories of two countries meet, but where their economies intersect--"development" all too frequently comes at the expense of the environment or the well-being of local communities. Indeed, the governments of the United States and Mexico ignore, and even encourage, environmental degradation on the border for the sake of increased trade and industrial growth. The transformation of the border from backwater to industrial boomtown has not only seen policies implemented that neglect environmental considerations, but has also sparked conflict between states, between rural stakholders and the industrial cities that have sprung up on the border over the last 25 years, and even between different rural communities fighting for their share in a zero-sum game.

Mexico's El Cuchillo Dam Project, located on the San Juan River some 48 miles south of the Rio Grande near the town of China, Nuevo León, offers a clear example of how development that undercuts careful management of natural resources can impact the environment, affect communities, and lead to conflict between different sectors of society as well as between Mexico and the United States.

The Project

The Mexican government built the project to increase water availability for residential and industrial uses in Monterrey, Nuevo León, Mexico's second most important industrial center. The project consists of: the El Cuchillo Dam, a 43-meter dam with a maximum storage capacity of 784 million cubic meters; five pumping stations that convey water over 60 miles via a covered aqueduct to Monterrey; water meters and other improvements to facilitate water delivery to end-users; a canal that allows the city of Reynosa, Tamaulipas, to draw its drinking water from the Rio Grande; and a wastewater collection and treatment system for pumping treated effluent from an area northeast of Monterrey into the Pesquería River, out of Nuevo León, and into the state of Tamaulipas and, ultimately, the San Juan River.

With a $325 million loan from the Inter-American Development Bank, the project was rushed to completion during the presidency of Carlos Salinas de Gortari, who was indebted to the industrial elites of Monterrey. In October 1994, Salinas inaugurated El Cuchillo even though the sewage treatment plants were unfinished. The floodgates were closed, the dam's reservoir began to fill, and a slow-motion disaster started to unfold downstream.

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[55] This article as written also appeared in the Interhemispheric Resource Center's newsletter: *borderlines*, vol. 7, no.6, iss. 57 (July 1999)

The Consequences

The San Juan River, the second largest tributary of the Rio Grande within Mexico, had flowed unimpeded until 1936, when the Marte R. Gómez Dam was built approximately five miles from the U.S.-Mexico border and 40 miles west of Reynosa. Until the construction of the El Cuchillo project, the reservoir created by the Marte R. Gómez Dam--known in the U.S. as Sugar Lake--had provided a relatively clean source of drinking water to Reynosa and irrigation water to the 26th Irrigation District, which surrounds Sugar Lake.

But since coming online, El Cuchillo has devastated northern Tamaulipas. As a result of the diversion upstream, water that once supported rural users downstream has virtually dried up. Approximately 300 fishing families who earned their living from Sugar Lake lost their livelihoods, as have some local merchants and motel owners. Similarly, farmers in the 26th Irrigation District have lost their crops over several seasons. The number of hectares of affected crop lands are estimated as high as 70,000, and as many as 20,000 families may have been affected. Also, Reynosa's drinking water now comes from the Rio Grande, which is extremely polluted.

The true extent of project impacts in the U.S. and Mexico has not been documented, because the respective governments do not acknowledge that significant impacts have occurred, and environmental assessments have not been undertaken. All legal efforts in Mexico to establish accountability have been frustrated. Mexican authorities insist that the ongoing drought, which has plagued northern Mexico for several years, is solely to blame.

On the U.S. side, officials are--or pretend to be--ignorant of any impacts. Environmental harm in the U.S. is not as serious as in Tamaulipas, but ecosystems, groundwater levels, and disease transmission vectors have been affected. In 1995-96, binational relations were also strained by a U.S. water loan to Mexico and unauthorized pumping of water from the Rio Grande by Mexican farmers, which is sure to be repeated in the future.

In November 1997, Mexican authorities announced the construction of yet another dam in the border region, the Las Blancas Dam on the Alamo River. The new dam, which is a response to the political pressure generated by the farmers of the 26th Irrigation District, will be built near Ciudad Mier, Tamaulipas. Once again, governmental authorities did not consult local populations, and appropriate environmental impact studies probably were not conducted. And once again, conflict between different sectors of society produced by government's focus on commerce and industrial development has produced ad hoc, reactive, and rushed policymaking that poses a threat to the environment.

Conclusion

The unsolved social and environmental problems wrought by Mexico's El Cuchillo Dam project illustrate that neither governments nor domestic and international environmental law--given the current paradigm of "development at any cost"--cannot be expected to remedy such harms in the U.S.-Mexico border region, and why a human right to a healthy environment should be recognized. Such a right, enforceable through effective, independent legal fora, could lead to remedies for state-sponsored environmental degradation like the El Cuchillo project.

Working toward the creation of an International Environmental Court, or perhaps a NAFTA Environmental Court, might be a viable alternative. Indeed, binational efforts for managing transborder natural resources according to principles of sustainable development should be accompanied by regional and international efforts to develop legal concepts, instruments, and international judicial fora that can enable residents in the U.S.-Mexico border region, as in other areas of the world, to protect their health, environment, lives, and future.