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Lessons Learned and Recommendations for Coping with Future Scarcity

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Lessons Learned and Recommendations for Coping with Future Scarcity

I. INTRODUCTION

The master of metaphor, Albert Utton, began this collection with the image of the growth of water demand in the Río Grande/Río Bravo basin in the face of limited supply as an increasingly painful pinching shoe that has reached the limits of tolerance. The case study of the Río Grande/Río Bravo Basin and its experience with the drought beginning in 1993 is itself a parable for transboundary surface and groundwater resources shared all along the arid international border between the United States and Mexico. The papers in this symposium shed light upon a number of critical questions, teach some important lessons, and point toward some recommendations which would, if implemented, make future droughts both less likely and less severe. The source material for this essay is drawn entirely from the papers themselves and the discussion they generated at the November 10–12, 1997, workshop in Cuernavaca sponsored in concert with the Udall Center and the School of Social Ecology.¹ The normative analysis originates for the most part from points of view expressed by particular participants. Not everyone who attended the workshop will agree with some of the conclusions I have chosen to include. Moreover, some lessons and advice may reflect less what has been offered by other authors, and more the product of lessons I have drawn in response to the evidence and opinions they have expressed. Therefore, I cannot claim this final paper represents any kind of consensus. My hope, however, is to impart to the reader the challenge of the rich intellectual discussion and atmosphere of comity and cooperation that existed at the meeting. If some of the recommendations that follow seem either unrealistic or overly innovative, then I will have captured the participants' determination to eschew narrow national interest and to take the longer

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1. The International Transboundary Resource Center is associated with the University of New Mexico, the Udall Center for Studies in Public Policy is located at the University of Arizona, and the School of Ecology is at the University of California at Irvine. Funding for the meeting and the preparation of this paper came from the Ford Foundation in Mexico.

view concerning environmental sustainability, a subject that knows no borders.

II. WHAT IS A DROUGHT? DID THE RÍO GRANDE/RÍO BRAVO SUFFER A PERIODIC DROUGHT BETWEEN 1993 AND 1996 OR IS THERE A CONTINUING SHORTAGE?

The notion of drought is a social construction about which there is no "objective" view divorced from human values and experiences. Carlos Rincón, who noted that it is uncertain whether the latest drought began in 1993 or later, and whether it has yet ended, also has observed that drought is more a matter of social and political realities than of expert definitions. But even experts disagree, often on the basis of their disciplinary perspectives, and social, hydrological and legal meanings differ sharply. In international relations, legal definitions carry great weight. The 1906 treaty invokes the term "extraordinary drought" as a justifiable reason for the United States to cut normal deliveries to Mexico proportionate to those imposed within the United States. This provision has resulted in reduced deliveries during fourteen of the last fifty years. An occurrence likely to happen better than twenty-five percent of the time hardly seems extraordinary on its face.

Further, the existence of vast engineering works and storage facilities makes droughts as much an issue of management as an act of Mother Nature. Engineers who control releases from dams have operating procedures that govern the quantities and timing of water allowed to flow downstream. In consequence, some users or some sections of the Río Grande/Río Bravo may experience shortages, which are experienced very much like droughts, while others have ample supplies. Engineers in governmental agencies are unable to act on their own. They are to a large extent compelled by physical, bureaucratic, social and political imperatives.

Human actions were largely responsible for the Río Grande/Río Bravo drought, particularly as it was encountered in Mexico, as Ismael Aguilar Barajas pointed out at the conference. He noted that the conflict, which exploded in the Río San Juan Basin, a tributary to the Río Bravo, may be ascribed to the action and inaction of Monterrey municipal officials, former state governors, and former Presidents of the Republic. Drought came less from lack of rain than from lack of timely and responsible governmental performance and political leadership. Early warnings were ignored; plans were either not made, or made and not implemented.

Human agency or ability to act in the face of drought is constrained by past patterns of action and institutions of humans' own making, but there are physical "facts" or indicators that suggest the range of freedom for action is diminishing. Hydrologist Jaime Collado reported to the workshop that global climate change models for northern Mexico suggest

a future which may not only be hotter and dryer, but will also include much more variation in precipitation, triggering events which people experience as more frequent floods and droughts. How qualitatively different the future will be from the past is a matter of some scientific dispute. John Hernandez's interpretation of the dendrochronological record is that extreme variation has existed for centuries in the Río Grande Basin. His data indicates that the diminution of rainfall in the period between 1993 and 1996 was not far from the mean and can reasonably be expected to occur about every five years.

Groundwater aquifers are being rapidly depleted, with recharge replacing only about twenty percent of that pumped out. The Hueco Bolsón, upon which the cities of El Paso and Juárez depend, is being overdrafted at a particularly alarming rate. The loss of groundwater is distinctly serious since it represents the "water in the bank" upon which humans can depend when surface water supplies are not available. Since most cities in the basin have historically depended upon groundwater for their water supplies, the deposits that should have been set aside for rainless days already have largely been spent.

While supplies of water are constant or diminishing, municipal water demands are rapidly increasing. Population explosions are occurring in basin cities both north and south of the international border. Monterrey, for example, is expected to reach four million inhabitants by 2010, five million in 2020, and six million in 2030, which will be twice the 1997 population. Similar projections are made for Albuquerque, El Paso and Juárez. Demand is pressing closely upon supply. While the period between 1993 and 1996 may or may not have been a drought, depending upon where you lived and what kinds of users (human, agricultural, natural, et cetera) were reflected, there is little question that the Río Grande/Río Bravo faces a future of continuing shortage.

A. Lessons from the Drought

Droughts, though painful, are not entirely bad, as the preceding papers and comments from the workshop make clear. Crisis has a way of creating political consent for actions that otherwise would be infeasible. According to John Baker, a member of the Texas Natural Resource Conservation Commission, and Mary Kelly, Executive Director of the Texas Center for Policy Studies, Senate Bill 1, which represented a substantial move toward better water management in Texas, would never have had a chance to pass through the legislative process absent the drought. Similarly, according to Ismael Aguilar Barajas, in Mexico the drought created an awareness of water problems and a willingness to consider conservation measures that otherwise would not have been possible. Another fortunate side effect, according to Stephen Mumme, was the

agreement of the International Boundary Waters Commission/*Comisión Internacional de Límites y Agua* (IBWC/CILA) on Minute 273. As his article in this volume indicates, Minute 273 is narrow and fails to define extraordinary drought, but it speaks favorably for the constructive potential of the institution that promulgated the agreement. The door is now open for the international exchange of much more drought information and for discussion of more specific drought agreements.

At the same time that droughts create the potential for action, they may also increase the likelihood that actions taken will be ill considered. To paraphrase Commissioner Arturo Herrera-Solis, floods cause panic and screaming while droughts can invite gunfire among the populace. Barajas spoke to the price which drought exacts in terms of willingness of officials to share information and to cooperate when issues of water allocation become highly politicized, as they do in times of drought. Further, droughts can do irreparable damage. At the conference, Denise Fort recounted the cost of the drought upon the silvery minnow. Octavio Chavez attested to the loss of pecan trees in Tamaulipas.

B. Recommendations Related to Drought

Stephen Mumme presents a most convincing argument that the IBWC/CILA must develop a better definition of "extraordinary drought." He suggests that a task force be convened to specify the conditions under which such scarcity could be said to exist. IBWC/CILA needs to take actions that will put other federal, state and local agencies on notice that an emergency exists. The Environmental Protection Agency's Border 21 Program and the Commission on Environmental Cooperation also have roles to play in planning for drought and the implementation of drought policies.

The United States and Mexico need to move ahead on forging a groundwater allocation agreement. It has taken over twenty years to arrive at a position from which the crisis in the Hueco Bolsón can be addressed, and the action is limited to quantification of reserves. The pace of coming to international agreements on groundwater has been much too slow and is simply not responsive to the gravity of the problem. The literature and models to formulate a good groundwater agreement already exist, much of it published in past issues of this Journal.

More attention needs to be paid to drought planning by all levels of government. That such planning has often been lacking is understandable. Commissioner John Bernal noted that the time of his limited staff was all too often taken up by the necessity of dealing with today's issues, and that the organizational capacity for planning for future events was limited. Drought planning needs to be made a higher priority in light of the inevitable problems facing the Río Grande/Río Bravo Basin,

and Congress should provide a clear mandate and budget to the international agency to do drought planning.

In addition, stream flows must be more adequately protected through timely federal action to enforce existing federal laws that protect endangered species. State legislatures need to pass laws and otherwise take actions to dedicate water rights to sufficient minimal flows to protect fish and riparian habitat. Government at all levels has lagged behind the public in its willingness to make sacrifices to protect natural values. The value of water in consumptive uses for perennial crops is considerably lower both in social and economic terms than the environmental values that were sacrificed in the middle Río Grande. There exist innovative means for protecting in-stream flows, including state purchase of water rights, water banking, and other mechanisms. These should be employed.

III. ARE INSTITUTIONS SUFFICIENTLY FLEXIBLE TO DEAL WITH DROUGHT AND SCARCITY?

Albert Utton's introductory essay to this collection expresses pride and optimism about what has been accomplished during this last century to adjust water law and institutions to satisfactorily address problems as they emerged. Looking forward, he is more pessimistic. The problems grow increasingly difficult and they are being dealt with less ably through only marginal and incremental modifications and advancements in institutions and human behavior. The division of water among parties on the Río Grande/Río Bravo that appeared equitable in 1906 now seems less so in light of the proportionately greater population growth on the Mexican side and the much larger per capita water use on the United States side. Inadequate attention has been directed toward water conservation practices and the true value of water is not reflected in unrealistically low water pricing. The city of Santa Fe has demonstrated what can be accomplished on the municipal level through aggressive conservation policies. Individual water rights holders believe and act as if their property rights are absolute even though meeting future water challenges will require widespread adjustments and sacrifices.

A. Institutional Lessons

The institutional state of water affairs is not without bright spots, which are presented in the articles in this volume and in discussion at the conference. The United States and particularly Mexico have made large advances in recent years in decentralization, devolution, and privatization of control over water resources. Local governments and nongovernmental organizations have a larger voice than ever before in water matters. Possibilities for regional transboundary strategies for water management

are developing. In some ways international relationships are improving. Technical assistance to Mexico for water conservation during the drought was forthcoming from the state of Texas. There is almost a consensus among informed observers that the institutions created in connection with the North American Free Trade Agreement (NAFTA) represent improvements. The Border Environmental Cooperation Commission is a more representative institution than had previously existed, and its project evaluation criteria, which include environmental sustainability, more accurately capture contemporary values.

IBWC/CILA has demonstrated greater leadership and ability to innovate than the critics of this institution previously believed was possible. Minute 293, written to deal with the 1996 drought and the plea of Mexican President Ernesto Zedillo for additional water supplies to meet the crisis occurring in his country, was a very narrow and stop gap solution. Stephen Mumme argues that none the less, Minute 293 signals the institution's willingness to take a more active future role in resolving drought problems. The Bureau of Reclamation, which manages many of the dams and projects along the Río Grande affecting relationships among users, including those in Mexico, is demonstrating new and enlightened direction. A federal lawsuit, brought by the Bureau of Reclamation, seeks to clarify water rights along the river and assert title to all the Río Grande water used in the Basin below Elephant Butte Dam in New Mexico and into Texas. Bureau of Reclamation Commissioner Eluid Martinez argued at the Cuernavaca meeting that such an accounting is critical to future negotiations with Mexico on groundwater rights issues, given the different and often conflicting water laws of New Mexico and Texas.

The potential for water banking, exchanges, and marketing is being explored. Carlos Rincón observed that additional supplies can be made available through more efficient use in farming, since agriculture represents such a large water use in the Río Grande Basin. He provided the example of several water associations that, in 1995, decided to forgo cropping in exchange for money they used to line canals and rehabilitate their dam so that future water use could be more efficient. In the meantime, drought stricken urban areas had the benefit of temporary relief supplies. A great deal can be accomplished in municipal water conservation as well, as the efforts of the city of Santa Fe have demonstrated. In general, demand side strategies for confronting shortage are cheaper and more environmentally benign than supply side measures that involve engineering works and inter-basin transfers.

B. Institutional Recommendations

The number of new watershed and river basin planning institutions being reinvigorated and created is a sign of institutional

progress and should continue to be fostered by federal and state legislation, the Bureau of Reclamation, IBWC/CILA, BECC, and future international policies. However, the character of locally controlled water planning and management institutions must be carefully monitored. There is a long, but not always well-remembered, tradition of capture of water users associations and local planning agencies by narrow user interests. Local decisions are not automatically more open or more representative. They can be, and often are, dominated by elites.

As Denise Fort observed, the environmental community, particularly in states like New Mexico, is not always well organized with sufficient resources to fully participate as equal partners with governments and commercial interests in watershed or basin organizations. Municipal water utilities cannot be depended upon to reflect the environmental points of view of many of their customers. Utilities are often driven to lay claim to the most water possible at the lowest price, regardless of social and environmental consequences. Furthermore, environmental groups themselves may be dominated by large contributors and poorly reflect the public's actual concerns about water. The federal governments have roles in organizing and insuring open, balanced, and discursive decision making processes within watershed or river basin organizations. Such an umpire function can be performed without top-down domination. At the same time, the federal governments themselves embody points of view that are needed for the appropriate balance between parochial interests and larger, basin wide concerns. Only federal agencies have sufficient jurisdiction to track the larger, systemic consequences of local actions. Agencies at the federal level must continue to generate long term, basin wide, binational data.

Mexican interests and organizations must be present and involved in drought planning in upstream areas where such plans are likely to affect their supplies in times of shortage. As the prospective lining of the All American Canal in the Colorado River Basin demonstrates, what appears to save water on the United States side in the Imperial Valley results in a loss of water supply in the Mexicali Valley across the border. Drought may potentially create serious international conflict. To avoid confrontation, planning must take into account the transboundary nature of water resources through open discussion and acknowledgment of Mexican interests and points of view. The Water Planning and Management Council on the Lower Río Grande must work closely with a Mexican counterpart. Facilitating the organization and linkages of such planning groups is an excellent use of BECC funding for local technical aid.

International water marketing needs to be explored as a means to introduce greater flexibility into water management institutions. At the same time, water marketing internationally, or within nations, is not the perfect win/win institutional innovation it is often idealized to be. Water

marketing should take place only when actual consumptive use is being transferred, and the consequences to public welfare, including those to rural communities that suffer as farms are retired, must be appropriately weighed. Moreover, practices of equitable sharing outside market institutions need to be explored and encouraged. Such interaction outside markets builds the trust and confidence upon which good international relations and the viability of markets ultimately depend. A long tradition of such mutually beneficial arrangements existed in Spanish Water Law long before the prior appropriations doctrine individualized and made water rights more inflexible. As Richard Bath suggested at the conference, water rights, like other rights, are not absolute and must be balanced with larger social welfare. The Arizona Groundwater Management Act has pioneered the concept of water rights that decline over time in areas where aquifers are being depleted and supplies are scarce. This concept is applicable to the Río Grande/Río Bravo and other border areas.

IV. IS ECOLOGICAL SUSTAINABILITY POSSIBLE IN THE FACE OF SHORTAGES AND DROUGHT IN THE RÍO GRANDE/RÍO BRAVO BASIN?

Reopening international agreements appears impossibly difficult, yet living under antiquated laws is also creating great stress. For example, the Article 3 priorities for water allocation built into the 1944 treaty place the needs of agriculture and livestock above industrial, electrical, or fishing and hunting uses. Environmental sustainability, of course, is absent from the priorities. The Río Grande/Río Bravo is an environmental resource of enormous value. It serves as a wildlife corridor and habitat for numbers of rare and endangered species; it is the heart of twin and cooperating national parks in the United States and Mexico. American Rivers, a national advocacy organization, chose the Río Grande to head its list of the most endangered rivers in the United States. While much of the attention toward water on the border has been directed toward water quality and the improvement of waste treatment in order to protect public health, the focus of concern is changing. Human well-being and a healthy ecosystem are not separable. The rate of urban population growth in the Río Grande Basin is ultimately fatal to other living things and in the long term is nonsustainable for humans. For example, in 1906 the population of Juárez was about 8,000 while El Paso was a metropolis of 16,000. Today the population of Juárez is nearing two million and El Paso is about 675,000. Population in the border area of Texas is predicted to increase by 86 percent between 1990 and 2000.

A. Lessons from the 1996 Drought Concerning Sustainability

The threat to an endangered species, the silvery minnow, led to a largely successful effort to coordinate river operations to protect species. However, this lesson came at a price. During the time when the riverbed was dry, significant numbers of the species were sacrificed. Further, the crisis for the silvery minnow would not have led to remediation had it not been for the Endangered Species Act and a strong federal presence. According to Gary Rowe of the Bureau of Reclamation, the agency learned a great deal about contingency planning and dam management as a result of the crisis. The value of close working relations with those with whom the agency has contracts was also reinforced. Native Americans, including the Jicarilla Apache, played a critical role in saving the endangered fish through their willingness to forgo their water rights.

B. Recommendations Related to Sustainability

Planning is out of fashion, especially at the federal level, but it is absolutely essential for the environmental sustainability of drought prone river basins. It is the responsibility of planners to raise serious questions about the advisability of continuing to accommodate run away urban growth in arid regions where transboundary resources are becoming overtaxed. Of course, plans are useless without implementation, and implementation is likely to be only as strong as public understanding and support. It is the role of water planners to use opportunities such as the 1996 drought to articulate public warnings about long-term consequences of unmanaged growth.

The sustainability criteria adopted by the Border Environmental Cooperation Commission needs to be more widely adopted, not just in the funding of new projects, but in evaluating management decisions including implementation of new policies like water banking, sales, and exchanges. In-stream flows must be more aggressively protected by all levels of government. New watershed associations should seriously consider buying up water rights to assure ample in-stream flows not only to protect endangered species, but also to restore riparian habitat and create recreational opportunities.

Although the Endangered Species Act has proved to be flawed, it was of enormous value in pursuing sustainability during the 1996 drought. It should not be replaced or sacrificed with something that may be even less effective. While decentralization and devolution in water resources management is desirable, the federal government cannot relinquish its role as the ultimate protector of national environmental values.

V. CONCLUSION

Open, frank discussion, in neutral forums, of contentious issues such as drought is of vital importance to the welfare of the United States/Mexico border. The Cuernavaca conference and the papers produced from it and printed in this Journal are testimony to what can be learned from the creation of a dialogue between government officials, university faculty, and representatives of nongovernmental organizations. On their own, nongovernmental organizations seldom have the resources of knowledge and financial support to engage in and sustain binational dialogue. Conferences of university professors tend to serve professional interests rather than the transfer of knowledge into action. While governments have long served the function of conveners of problem-solving meetings attracting wide audiences, in recent decades governments have lost their legitimacy and are suspected by other interested parties of having hidden bureaucratic and political agendas. Particular gratitude is due to the Ford Foundation in Mexico for bringing these groups together and making this most valuable discussion possible, and to Albert Utton, Co-Director of the International Transboundary Resources Center, who orchestrated it all.