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ACTIVE WATER RESOURCE MANAGEMENT IN THE LOWER RIO GRANDE: ADAPTING TO BASIN-SPECIFIC REQUIREMENTS

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Introduction

The Lower Rio Grande (LRG) Basin in New Mexico exists in a unique hydrological and institutional setting. As water planning, management, and administration attempt to keep up with the area's steady population growth and recurrent droughts, it remains the challenge for regulators, policy makers, and water users to understand the specifics of the basin and craft appropriate management strategies to optimize the beneficial use of water in the basin.



Figure 1: Lower Rio Grande Basin, New Mexico (NM Office of the State Engineer, 2005).

Hydrology

The hydrology of the LRG is quite diverse, but its dominant features are the Rio Grande and the hydrologically connected aquifers. The Rio Grande Project, which the U.S. Bureau of Reclamation authorized in 1905 and substantially built by 1917, appropriated “All the unappropriated water of the Rio Grande and its tributaries” (Hall, L.C., 1908) with a priority date of January 23, 1907. The Rio Grande Project provides water to 90,640 water-righted acres in New Mexico’s Elephant Butte Irrigation District (EBID), 69,010 acres in the El Paso County Water Improvement District No. 1 (EPCWID) in Texas, and 60,000 acre-feet of water pursuant to the 1906 treaty between the U.S. and Mexico.

In the 1950s, a period of persistent drought began that continued through 1978. The Bureau of Reclamation operated the Project during this period as a single project, paying little attention to the New Mexico Texas state line. In response and at the urging of the Bureau, farmers of the Rio Grande Project installed wells and began pumping groundwater to supplement the surface water supply.

The surface water supply recovered in 1979, coincidentally the time the Districts paid off their construction loans to the federal government and began taking over operations no longer as a unit, but as two separate Districts. The full water supply continued through 2002. In 2003 and 2004, the surface water supply was severely reduced again. While the water supply improved markedly in 2005, 2006 is looking dry again. Fortunately, the two Districts left water behind in 2005 that will help greatly in 2006.

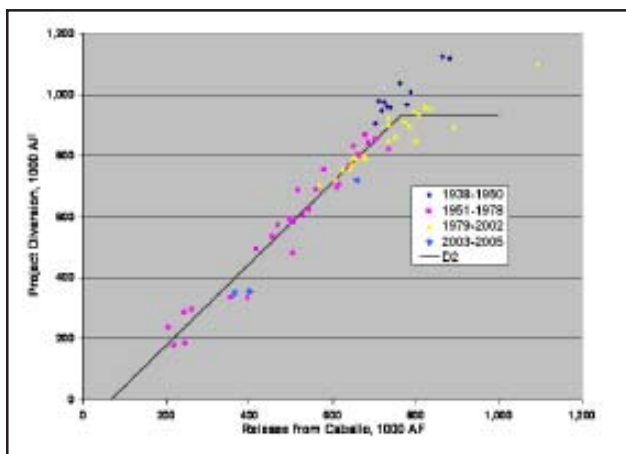


Figure 2: Rio Grande Project releases from Caballo Dam and Total Project Diversions, 1938-2005. Note: 2005 is an estimate.

Institutional Setting

The institutional setting is a bit more convoluted than the hydrology in the area. In 1938, the states of Colorado, New Mexico, and Texas developed the Rio Grande Compact, which divides the water of the river among the three states and provides for compliance with the 1906 treaty with Mexico. The Compact specifies a delivery obligation for Colorado to New Mexico at the state line based on available water supply at index gauges in the headwaters of the Rio Grande.

The Compact also specifies a delivery obligation for New Mexico to Texas based on flow at Otowi gauge, just below the confluence of the Rio Chama and Rio Grande. However, at the time of the Compact’s development, the Rio Grande Project was operated as a single unit by Reclamation, and the Compact delegates from New Mexico and Texas stated that the interests of EBID and EPCWID could not be separated. Therefore the delivery point for water to Texas is Elephant Butte Dam, some 100 miles north of the New Mexico – Texas state line, and most of the LRG is regarded as Texas by the Compact.

While the Rio Grande Project and the Rio Grande Compact deal directly with surface water, administration of groundwater is under the auspices of the State of New Mexico. Due to the operation of the Rio Grande Project by the Bureau of Reclamation from 1916 to 1978, the New Mexico Office of the State Engineer (OSE) did not have a very high profile until the basin was declared in the early 1980s. Irrigators filed well permit applications with the OSE, but no reporting of groundwater use by irrigators was required.

The use of groundwater was informal during the drought period of 1951-1978. Due to the short water supply in those years, the Bureau of Reclamation encouraged irrigators served by the Rio Grande Project to install wells to pump for themselves and their neighbors, the beginning of conjunctive use of surface water and groundwater in the area.

Water Use in the LRG

The City of Las Cruces and other municipal areas in the LRG have been growing steadily and quite rapidly in recent years. Their combined water use is still much less than that of irrigators. The 2004 LRG Regional Water Plan stated that 90 percent of the water diverted in the LRG is for irrigation, mostly within EBID, but also some primary groundwater irrigation. As the

Regional water plan makes clear, the amount of water in the LRG is not increasing significantly, and the available water in the Rio Grande and its associated aquifers is fully appropriated; the pie in Figure 3 is not growing. In order to provide water for inevitable municipal growth without impairing downstream water users in Texas and Mexico, the water must come from an existing use, and Figure 3 makes clear that the logical use is irrigated agriculture.

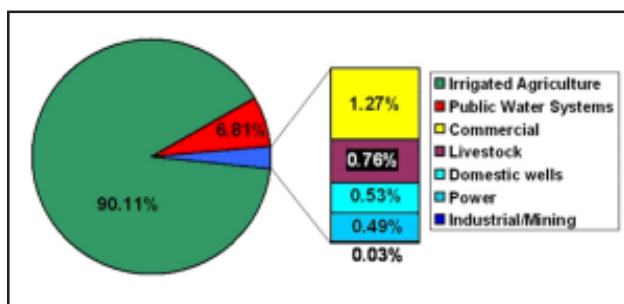


Figure 3: Water use in the LRG by sector. (LRGWUO, 2004).

Current Developments

The preparation of the Regional Water Plan by the Lower Rio Grande Water Users Organization (LRGWUO) proved to be a useful exercise in collaboration among the water users in the area. The local consensus on the water resource situation in the basin provided the members of the LRGWUO with a common base for planning the region's hydrologic future.

One of the important outcomes of collaboration among the City of Las Cruces, EBID, Doña Ana Mutual Domestic Water Consumers Association (DAMDWCA) and the OSE was the Special Water Users Association, an institutional tool supported by legislation. The SWUA essentially allows designated uses – publicly owned municipal suppliers, state universities, and the New Mexico Interstate Stream Commission – to become constituents of EBID. These entities can purchase water rights or lease water from a willing seller for non-irrigation uses. This provides municipal suppliers access to the large quantities and early priority dates of EBID's water supply in a way that protects the irrigators who choose to stay in farming, and to enhance the market value of farmers' water.

More recently, the OSE promulgated the state-wide Active Water Resource Management (AWRM) general regulations to allow state administration of water in the absence of a completed adjudication. The regu-

lations did meet some opposition in the state, as water users are understandably concerned about government efforts to regulate highly complex systems in which the users have substantial investment. The LRGWUO has chosen to take a collaborative approach, seeking to work with the OSE to develop alternative administration regulations for the LRG that are tailored to the specific hydrologic and institutional setting of the basin.

Managing Water in the LRG

Intelligent management of water in the LRG must first recognize the constraints faced by water users. The first and immediately pressing constraint is external – ensuring that downstream water users in Texas and Mexico are not impaired. As groundwater is withdrawn from the aquifers hydrologically connected to the Rio Grande in New Mexico, measures must be taken to ensure that the downstream users get their equitable share of Project water. Unfortunately, this equitable share is the subject of much dispute. One necessary development in LRG water management will be a specific obligation for water delivery to Texas and Mexico by the Rio Grande Project. This is the subject of ongoing negotiation among EBID, EPCWID, and the Bureau of Reclamation.

The second constraint is internal – ensuring that water is distributed equitably among water users within the LRG. New Mexico water law bases priority of use on seniority, so older water rights are served first. Therefore, water rights and water use with high seniority must be made available to critical uses, such as municipal supply. The SWUA provides the mechanism to do exactly this.

The management scheme must also recognize the inseparability of surface water and groundwater management. The division of authority over surface water (EBID) and groundwater (OSE) in historical operations has led to the false sense among many users and regulators that the two are separate – they are not. Some means of conjunctive allocation, usage, measurement, and accounting for surface water and groundwater is necessary that will require cooperation and sharing of authority among agencies. The logistical difficulties with such an arrangement are painfully obvious to those involved in the process.

The surface water supply of the area is commonly beset with severe and sustained drought such as the period from 1951 through 1978. The LRG is now in the midst of another drought cycle whose effects will

be exacerbated by the extensive urban growth in the area that occurred without water resource planning. The economic stakes are much higher than in previous drought cycles, making the environment ripe for the water wars that are as much a part of the region's hydrology as drought.

It may become necessary for the LRG to actually reduce its use of its share of Rio Grande Project water in times of drought and offset with increased groundwater use, but ensure that the groundwater is recharged in full supply times by pushing surface water as the primary source for the area. The use of surface water improves the aquifer status by reducing the need for groundwater withdrawals and by recharging the aquifer directly through deep percolation and canal seepage. Such conjunctive strategies are not well supported by off-the-shelf New Mexico water law, and they are complex, requiring sophisticated modeling tools.

True conjunctive management of surface water and groundwater, in the sense described in the preceding paragraph, will allow the LRG to maximize the economic – and perhaps even non-economic benefits of the water resources of the LRG. Such a view of the future of water management in the LRG may be thought to be a naïve, Pollyanna rant from the Ivory Tower. The author (who is loathe to refer to himself in the third person) is well aware of the adversarial traditions of water management in the southwest and much of the world. However, there have been notable periods when water agencies were able to transcend the usual brawl and craft principled agreements that guide generations of water management.

Such was the case in the development of the Rio Grande Compact of 1938, when the entire Rio Grande above Fort Quitman was allocated by consensus among Colorado, New Mexico, and Texas. In his letter of transmittal to the Compact delegates, Frank Adams and Harland H. Barrows, Consulting Board Chairs for the technical investigations that led to the Compact, stated (Natural Resources Committee, 1939):

“... The cordial willingness with which the official representatives of Colorado, New Mexico, and Texas entered into the undertaking exemplified constructive statesmanship... Each of these States is vitally concerned with its own welfare, yet in the Rio Grande Joint Investigation each recognized its obligation to its sister States; each accepted the principle that an equitable adjustment of conflicting interests in the waters of the river is imperative.”

What is now as important to the water users of the LRG, and to the taxpayers of the state, as a reprieve from the drought is constructive statesmanship among the agencies that will develop the AWRM administration regulations. We must live up to the standards of our hydrologic ancestors.

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