Economic Development Report

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Profile of the Rio Grande River Basin

by
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- *Agriculture comprises $530 million annually of the Rio Grande River Basin's sales (30%).*

- *100,000 irrigated crop acres are expected to become dry by 2030 (SWSI).*

Overview

Colorado's population is growing rapidly, with the statewide population growth from 2000 to 2030 projected to be around 65 percent. The proportion of the state's population living in urban areas has been increasing, corresponding to national trends. As Colorado's population grows and urbanizes, water is likely to shift from agriculture to municipal and industrial (M&I) uses. Indeed, cities plan to dry up about 300,000 acres of irrigated farmland statewide to meet future needs. In addition to the urbanization of agricultural lands, most water providers continue to acquire agricultural water rights, which are then allocated to other uses.

The purpose of this fact sheet (and the three accompanying fact sheets) is to describe the economic base of four river basins, which will set the foundation for discussing the economic effects of shifting water from agriculture to other uses. This fact sheet begins with a description of the basic demographics of the Rio Grande River Basin, followed by descriptions of the basin's economic base and agricultural sector. Next, it discusses the relative water supply and demand amounts in the basin, ending with a discussion of the future direction of our study.

Colorado is home to eight major river systems,[2] whose surface waters are divided among many uses. The Rio Grande Basin is comprised of all or parts of 6 counties (Alamosa, Conejos, Costilla, Mineral, Rio Grande, and Saquache) located in the south-central part of the state (Figure 1). The population in the Rio Grande Basin has increased by 18 percent since 1990, from 36,900 to 46,726 [1], and now accounts for approximately 1.1 percent of the state's total population. The population is expected to increase by another 35 percent by the year 2030 (Figure 2).

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[1] Authors are a graduate student and an associate professor, respectively, in the Department of Agricultural and Resource Economics at Colorado State University.

[2] The Republican River Basin is considered to be a sub-basin of the South Platte River Basin.

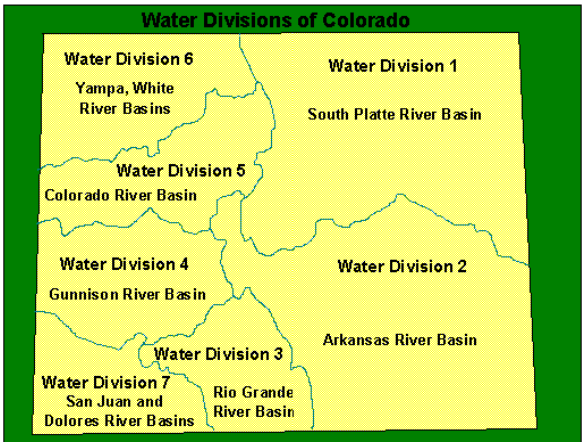

Figure 2: South Platte Basin Estimated Population Growth by 2030 (SWSI)

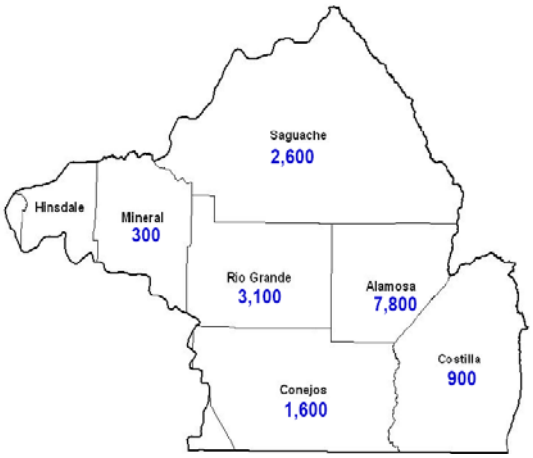

Figure 2: Rio Grande Basin Estimated Population Growth through 2030 (SWSI)

Economic Profile

The Rio Grande Basin accounts for nearly one percent of the state's employment. Annual value of sales and services of the Rio Grande River Basin is $1.8 billion, with agriculture industries comprising $530 million (nearly 30 percent) of this value (MIG, Inc., 2002). There are few economic alternatives to agriculture in the Rio Grande River Basin, and the counties in this region are heavily dependant on agriculture for their economic base. The reduction in irrigated cropland has implications not only for the agricultural sector, but also for the larger economy of the counties in the basin as well. If a substantial number of irrigated acres are removed from the Rio Grande River Basin's economic activity, impacts will ripple through the local economy, due to lost demand for farm inputs and reduced purchases of non-agricultural products with farm wages. Areas relying more exclusively on irrigated agriculture for economic activity, such as the Rio Grande Basin, are likely to suffer greater impacts versus regions with a broader, more diverse economic base. Table 1 lists the major industrial sectors of the Rio Grande River.

Table 1: Rio Grande Basin Economic Demographics

Industry	*Value of Sales (million $)*	*Percent of Total*
Total	$1,845	100.00%
Notable Contributors (Sectors)		
Government and non-NAICs	$271	14.69%
Cattle ranching and farming	$184	9.97%
Construction	$169	9.16%
Health and social services	$138	7.48%
Retail trade	$116	6.29%
All other crop farming	$111	6.02%
Agriculture and forestry support activities	$97	5.26%
Manufacturing	$90	4.88%
Wholesale trade	$65	3.52%
Finance and insurance	$62	3.36%

Agriculture

The total land area is 8,194 square miles (5,244,288 acres), with over a quarter of this land area in farm and ranch (28 percent). Of the area in farm and ranch, 41 percent is cropland. Of the cropland, 51 percent is irrigated cropland and 49 percent is dryland (Figure 3). The San Luis Valley has a good supply of high quality water and raises some high value crops, including potatoes, lettuce and malting barley [5]. Table 2 lists the value of sales by crop.

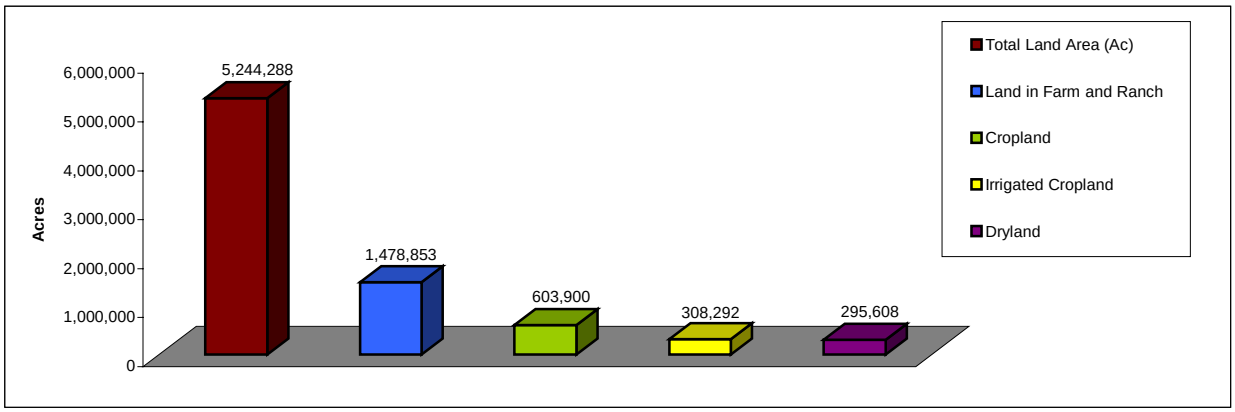

Figure 3: Rio Grande Basin Land Disposition

Table 2: Value of Sales by Irrigated Crop for Rio Grande River Basin Counties (2001)

Crops	*Total Production of Irrigated Crops*	*Value of Irrigated Crop Sales (million $)*	*Percent of Total*
Total		1,133.35	100.00%
Notable Contributors			
Potatoes (CWT)	112,255,000	$1,043.97	92.11%
Hay (TON)	606,950	$60.70	5.36%
Barley Grain (BU)	5,880,000	$16.46	1.45%
All Wheat (BU)	3,552,000	$9.59	0.85%
Oats Grain (BU)	1,385,500	$2.63	0.15%

Evolving Water Use

The Rio Grande drainage basin is comparatively small, with less than 10 percent of the state's land area. It is largely rural, and agriculture is the main industry in the basin. Water allocation in the San Luis Valley is governed by the restrictions set forth in the 1939 Rio Grande Compact, ratified by Colorado, New Mexico, and Texas. Irrigated agriculture is by far the dominant water use in the Rio Grande basin, using an estimated average of 2 million acre-feet (AF) annually (800,000 AF from groundwater sources) and consuming more than 85 percent of all water used (Figure 4). An estimated 600,000 acres are under irrigation, which are supplied by conjunctive use of surface and groundwater. San Luis Valley irrigation relies heavily upon conjunctive use of groundwater and surface water. An estimated 85 to 90 percent of irrigation water in the central part of the valley is from managed recharge and pumping of shallow ("unconfined") aquifer wells. SWSI[3] predicts that the Rio Grande basin will experience an increase in M&I and self-supplied industrial (SSI) water demand of 4,300 AF (a 33 percent increase) by 2030, based in part on the estimated population increase illustrated in Figure 2. In addition to the M&I and SSI demands, concerns over the over-pumping of the Closed Basin Aquifer have increased.

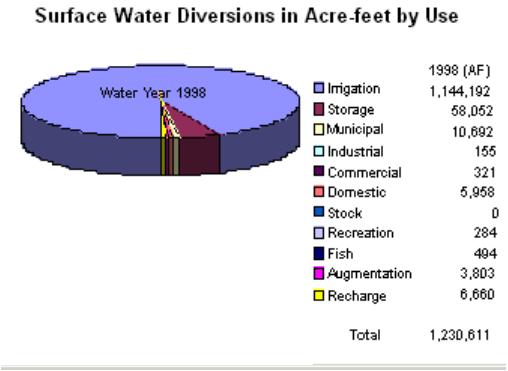

Figure 4: Rio Grande Basin Surface Water Uses

In the Rio Grande Basin, agricultural shortages and needs dominated much of the Basin Roundtable's discussions and efforts. Agricultural use is at unsustainable levels of pumping in the closed basin and water levels have dropped in the unconfined aquifer and in parts of the confined aquifer. Water levels in the unconfined aquifer north of the Rio Grande have experienced significant declines. The confined aquifer has also experienced localized declines in water levels.

Discussions are currently underway among water users to develop a plan to reduce irrigated acres and restore the aquifers to sustainable levels. There are existing agricultural shortages but these will be difficult to address given compact limitations and the over-pumping of the aquifer. As a result, the reduction in the amount of current irrigated agricultural land is the only Identified Project and Process[4] that has been proposed [Section 6, SWSI]. Achieving this reduction in irrigated acres will be a major challenge for the basin. Cities plan to dry up about 300,000 acres of prime irrigated farmland statewide to meet future needs, including up to 100,000 acres in the Rio Grande Basin [Section 5, SWSI]. As urban growth continues, there will be some natural retirement of agricultural lands as these properties are converted to urban use. In addition to the urbanization of agricultural lands, most water providers continue to acquire agricultural water rights to some extent.

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[3] The Statewide Water Supply Initiative (SWSI) is an 18-month study by the Colorado Water Conservation Board (CWCB) to take a comprehensive look at how Colorado will meet its future water needs. SWSI has identified how much water Colorado will need to help meet the needs of its growing population. The state's 8 major water basins will need an additional 630,000 AF of new water by the year 2030 to meet projected demands, 53 percent more water than is being used today.

[4] "Identified Projects and Processes" are those options that are relatively well-defined and can reasonably be expected to be implemented between now and 2030 to address current or increasing water needs.

Augmentation of M&I well pumping will be provided from a variety of sources, including existing trans-basin water rights diverted from the San Juan Basin, and existing and future agricultural transfers. Development of new water supplies may be affected by the Rio Grande Compact of 1938 (which establishes Colorado's obligation to ensure deliveries of water to New Mexico and Texas), endangered species (including the Rio Grande sucker and the silvery minnow), interstate litigation, and over-appropriated surface and groundwater sources. Water administration in the San Luis Valley is difficult because of its unusual geologic and hydrologic complexity [5]. The number of AF of conditional storage rights exceeds the amount that can be developed given compact limitations. Due to the limited availability of water in the Rio Grande and compact limitations on post-compact reservoir storage, development of conditional rights[5] is not anticipated.

Future Direction

Agriculture represents approximately 91 percent of water used in Colorado and SWSI projections indicate that it will make up 86 percent of the water use in 2030. Seventy-five percent of the total value of Colorado crops is derived from the irrigated sector, highlighting the importance of, and dependence on, a secure water supply. The greatest changes in agricultural water use are expected to occur in the Front Range as M&I growth moves into agricultural lands and/or as water is transferred from agriculture to support growth. Understanding the impact of these changes on rural Colorado economies, and the effect on the open space provided by farms and ranches, is a key challenge for all Coloradans.

As the next step in our study we will use the number of lost irrigated acres predicted by SWSI to examine how such a loss in irrigated acres will alter economic activity in this region. We will use the IMPLAN input-output model to predict the direct, indirect and induced economic impacts stemming from this loss of irrigated agriculture in each of these four river basins. Our next fact sheet will discuss economic impact analysis and the use of input-output models. This will be followed a final fact sheet discussing the results and conclusions of our study.

Sources:

1. "Table 1: Annual Estimates of the Population for Counties of Colorado: April 1, 2000 to July 1, 2003 (CO-EST2003-01-08)." *U.S. Census Bureau, Population Division,* April 9, 2004.
2. "Rio Grande Basin Facts." *Colorado Water Conservation Board*, March 2002.
3. "Update on Statewide Water Supply Initiative-Rio Grande Basin." *Statewide Water Supply Initiative*, October 2004.
4. *Minnesota IMPLAN Group, Inc. 2002*. Colorado State University, Fort Collins, CO.

Donald I. Blewitt, "Administration of the Rio Grande Compact in Colorado." *Donald I. Blewitt,* 1991.

[5] A conditional water right allows an appropriator to secure a place in the priority line before any water is actually applied to beneficial use. To obtain a conditional water right, the applicant must show that the "first step" towards the appropriation has been taken. Once the appropriator actually places the water to beneficial use, an absolute decree may be issued with a priority date relating back to the date the appropriation was initiated through the "first step".