



Economic Development Report

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PROFILE OF THE ARKANSAS RIVER BASIN

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- *Agriculture comprises \$770 million in sales in the Arkansas River Basin.*
- *72,000 acres of irrigated cropland are expected to dry up 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, including compost compliance. This fact sheet begins with a description of the

basic demographics of the Arkansas 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 Arkansas Basin is spatially the largest river basin in Colorado, making up 27 percent of the surface area of the state. It is comprised of all or parts of 16 counties (Baca, Bent, Chaffee, Cheyenne, Crowley, Custer, El Paso, Fremont, Huerfano, Kiowa, Lake, Las Animas, Lincoln, Otero, Prowers, and Pueblo) located in the southeast corner of the state (Figure 1). The population of the Arkansas Basin has increased 28 percent since 1990, from 662,400 to 849,124 [1] and now accounts for 19.5 percent of the total state population. The population in the basin is expected to grow by another 55 percent by the year 2030 (Figure 2), primarily in the western half of the basin.

Economic Profile

Seventeen percent of the state's employment is in the Arkansas Basin [Section 2, SWSI]. Annual value of sales and services in the Arkansas Basin equal \$45.2 billion, with agriculture industries comprising \$770 million (1.7 percent) of this value [MIG, Inc., 2002].

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.

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Figure 1: Colorado's Water Basins

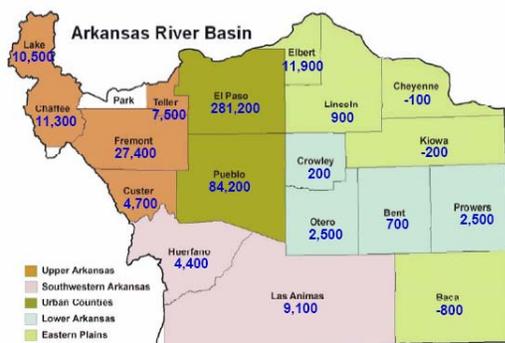


Figure 3 Arkansas Subbasins and Changes in County Populations 2000 to 2030

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

Focusing on the eastern half of the basin (Baca, Bent, Cheyenne, Crowley, Kiowa, Otero, and Prowers counties), agriculture industries comprise 30 percent (\$591 million) of the total value from sales and services, the largest percentage relative to the other 3 basins studied. There are few economic alternatives to agriculture in the eastern half of the Arkansas River Basin and the counties in this area are heavily dependant on agriculture for their economic base. Due to the high percentage of the total value of sales coming from agriculture, the anticipated reduction in irrigated cropland has many implications for the agricultural sector, as well as for the many other sectors of the economy. If a substantial number of irrigated acres are removed from the eastern Arkansas River Basin's economic activity, impacts will ripple through the local economy, due to indirect and imputed effects.

Areas relying more exclusively on irrigated agriculture for economic activity, such as the eastern Arkansas 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 Arkansas River Basin as a whole, while Table 2 lists the major industrial sectors of the eastern half of the basin.

Agriculture

The Arkansas Valley drainage has long been known as the state's premier agricultural area [5]. The total land area of the 7 eastern Arkansas River Basin counties is 27,315 square miles (17,481,536 acres), with nearly one third (29.96 percent) of this land area in farm and

Table 1: Economic Demographics for the 16 Arkansas River Basin Counties (2002)

Industry	Value of Sales (million \$)	Percentage of Total
Total	\$45,189	100.00%
Notable Contributors (Sectors)		
Government and non-NAICs	\$7,970	17.64%
Manufacturing	\$7,151	15.82%
Construction	\$3,857	8.54%
Information	\$2,957	6.54%
Retail trade	\$2,865	6.34%
Finance and insurance	\$2,813	6.22%
Other services	\$2,690	5.95%
Health and social services	\$2,686	5.94%
Professional-Scientific and Technical Services	\$2,527	5.59%
Real Estate and Rental	\$2,222	4.92%

ranch. Nearly half (45.26 percent) of the area in farm and ranch is cropland. Nearly one-tenth (9.92 percent) of this cropland is irrigated (Figure 3). Table 3 lists the value of sales by crop.

Evolving Water Use

The Arkansas River Compact became effective in 1949 and allocates Arkansas River water between Colorado (60 percent) and Kansas (40 percent) based on the inflow to John Martin Reservoir. Irrigation is the major water use in the basin, with about 2.0 million acre-feet (AF) diverted for irrigation in 1998 out of total diversions of 3.7 million AF. There is substantial

reliance on groundwater in the basin for irrigation uses (Figure 4). Furthermore, the Arkansas headwaters is one of the nation’s premier recreation areas. The area offers abundant and outstanding opportunities for fishing, rafting, kayaking, picnicking, hiking, camping, mountain biking, and sightseeing among deep canyons, broad valleys, and towering mountain peaks [Section 6, SWSI]. Following the South Platte Basin, the Arkansas Basin is projected to experience the largest increase in M&I and self-supplied industrial (SSI) water demand by 2030. The amount of this increase is estimated to be 98,000 AF, a 45 percent increase [3].

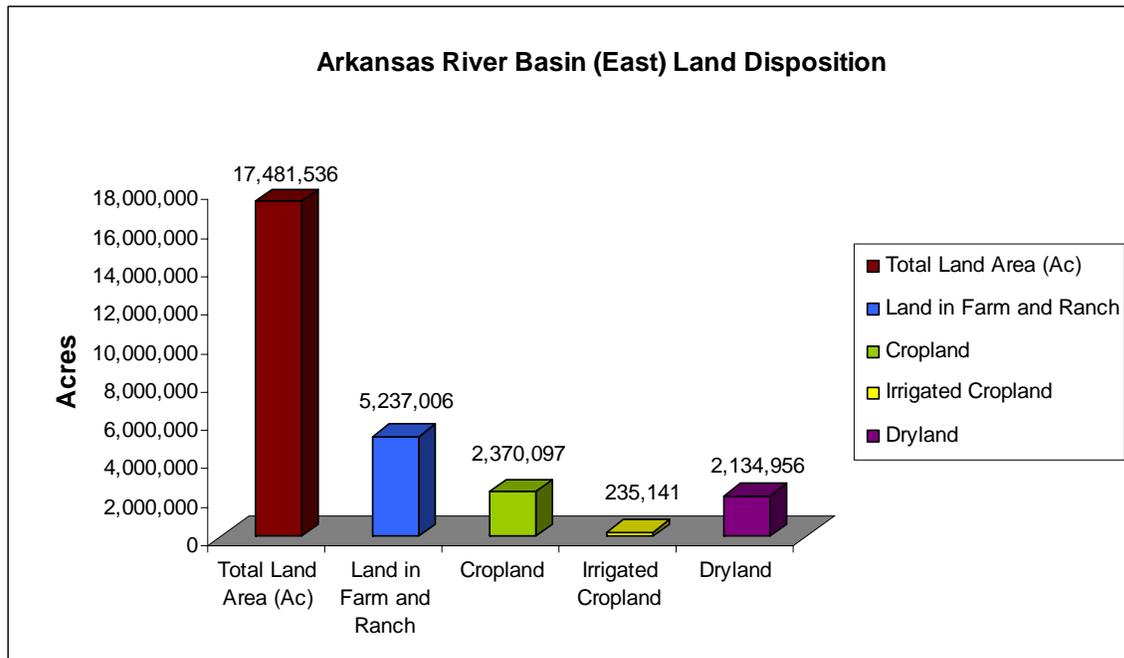
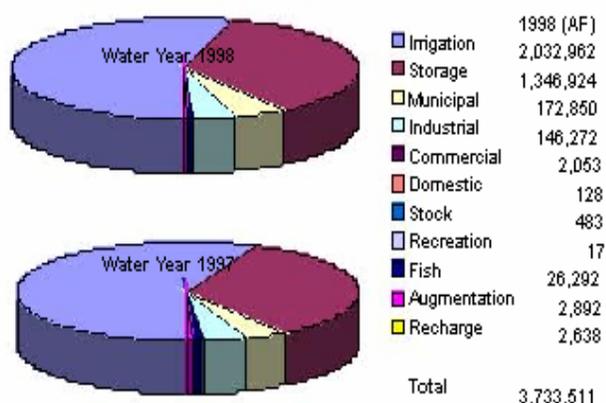


Figure 3: Eastern Arkansas Basin Land Disposition

Table 3: Value of Sales by Irrigated Crop for the 8 Eastern Arkansas River Basin Counties (2001)

Crops	Total Production of Irrigated Crops	Value of Irrigated Crop Sales (million \$)	Percent of Total
Total		\$101.43	100.00%
Notable Contributors			
Hay (TON)	645,825	\$64.58	63.67%
Corn Grain (BU)	6,811,200	\$14.64	14.44%
Sorghum Grain (BU)	8,510,175	\$8.51	8.39%
All Wheat (BU)	1,927,800	\$5.30	5.23%
Corn Silage (TON)	184,500	\$4.06	4.00%
Soybeans (BU)	393,330	\$2.89	2.85%

Surface Water Diversions in Acre-feet by Use



Source: [Colorado Division of Water Resources, Division 2 Annual Reports](#)

Figure 4: Arkansas Basin Surface Water Uses

The Arkansas River is fully appropriated by private water users and municipalities [5]. A recent hydrologic analysis (SECWCD 2000) showed very little legally available flow in the basin. Native Arkansas River flows were available for a junior water right in only 3 of the 30 years evaluated. This interpretation was confirmed during the Arkansas Basin Roundtable Technical Meetings where there was consensus that there are no reliable available water supplies for development in the basin [Section 7, SWSI]. The number of AF of existing conditional water storage rights³ in the basin far exceeds available supplies. As a result of compact limitations, over-appropriation, and lack of water availability, it is unlikely that significant amounts of conditional rights can be developed in the Arkansas Basin as a primary source of water supply.

Development of new water supplies will be limited and complex due to the compact allocation, interstate litigation, salinity concerns, and the presence of threatened and endangered species.⁴ While many major water providers in the basin currently have identified future water conservation as an identified project and process to meet 2030 demands, they do not foresee or propose to implement extreme (Level 5) conservation.

³ 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.”

⁴ The greenback cutthroat trout and the piping plover are listed as threatened, while the least tern is listed as endangered

In fact, most providers indicated they would acquire additional agricultural rights to meet future demands rather than implement extreme levels of conservation [Section 10, SWSI].

Agricultural water shortages are common and widely distributed throughout the basin but lack of water availability or financial constraints impede additional water development. Given the lack of developable new supplies in the Arkansas Basin, agricultural transfers throughout the basin will continue via purchases, developer donations, and development of irrigated lands. As urban growth continues, some agricultural lands will be converted to urban use. In addition to the urbanization of agricultural lands, most water providers continue to acquire agricultural water rights, which are then allocated to other uses. Cities plan to dry up about 300,000 acres of irrigated farmland statewide to meet future needs, including up to 72,000 acres in the Arkansas Basin [Section 5, SWSI]. Water quality concerns in the lower basin also impact agricultural uses.

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

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