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Economic Impacts of Irrigated Acreage Loss in Colorado's Lower Arkansas River Valley

By: Yvette Uwineza, Rebecca Hill, and Jordan Suter

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- The lower Arkansas River Valley has experienced long-term declines in irrigated acreage as agricultural water has been transferred to other uses.
- Irrigated land represents a small share of total acreage in the region, but it supports higher-value crop production and local economic activity.
- Using an input-output model, we estimate that losing approximately 3,043 irrigated acres per year reduces regional economic activity by about **$4.4 million to $4.9 million annually**.
- Each acre removed from irrigation is associated with roughly **$1,400 to $1,600 in annual economic losses**, depending on which crops are affected.

Lower Arkansas River Basin

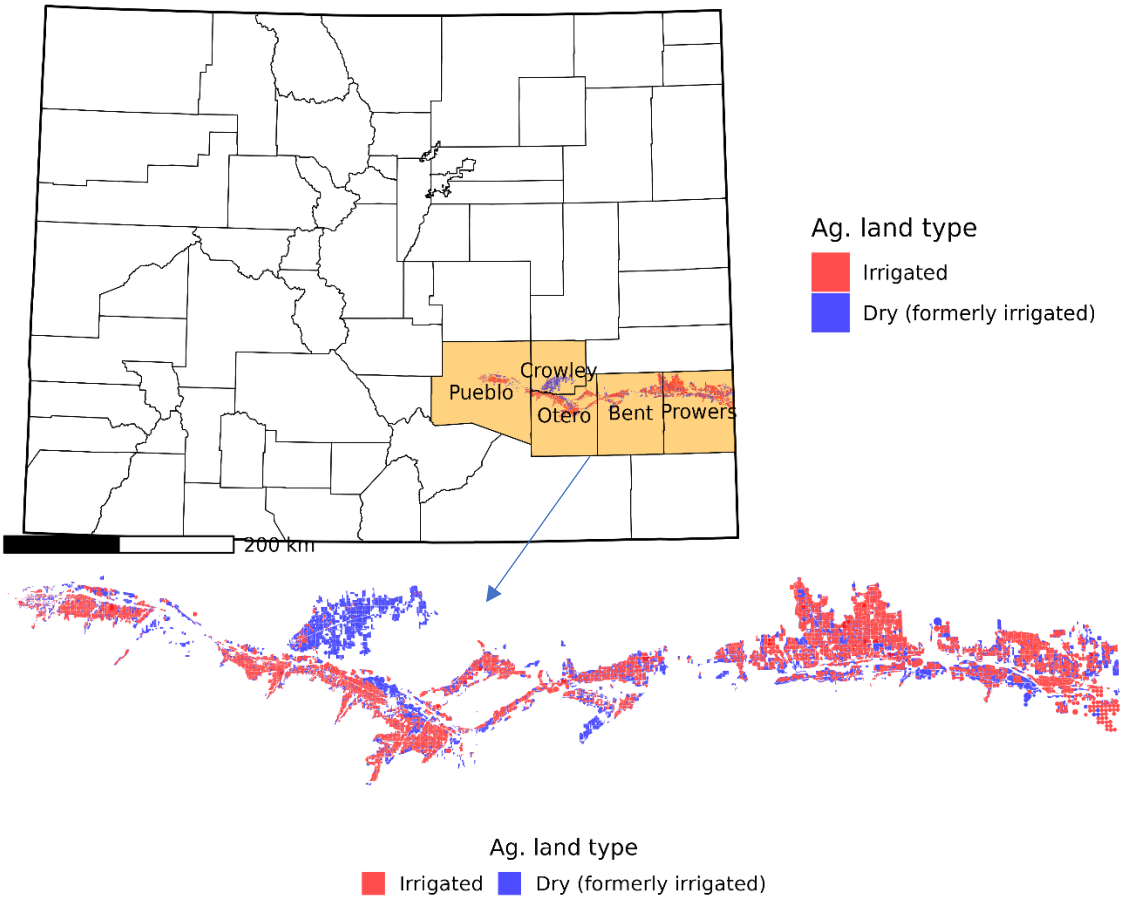

Figure 1: Study area: Lower Arkansas River Valley (Bent, Crowley, Otero, Prowers, and Pueblo counties), Colorado. Red polygons: irrigated parcels; blue polygons: formerly irrigated parcels now dry.

Background: Irrigated Agriculture in the Lower Arkansas River Valley

Limited water supplies and growing demand along Colorado's Front Range have increased pressure to transfer agricultural water to municipal and urban uses. In the Lower Arkansas River Valley, these transfers have contributed to the permanent loss of irrigated acreage, often referred to as "buy-and-dry." While these transfers can provide water for growing cities, they may also reduce agricultural production and create economic losses for rural communities that depend on irrigated farming. The Lower Arkansas River Valley includes Bent, Crowley, Otero, Prowers, and Pueblo counties. Agriculture remains central to the region's economy and identity, but irrigated acreage has declined over time. From 1978 to 2022, irrigated acreage across these five counties fell by more than 120,000 acres, an average decline of about 3,043 acres per year as shown in Figure 2.

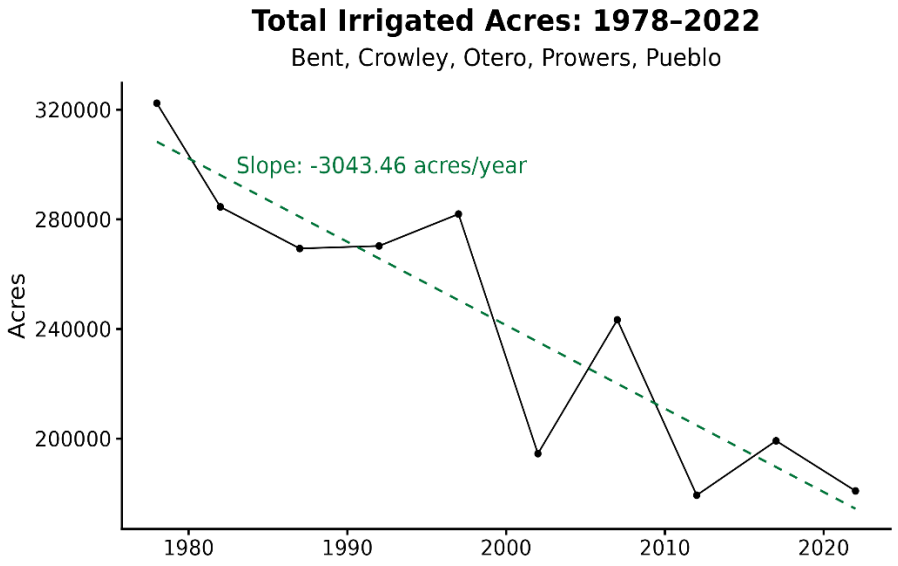

Figure 2: Irrigated acreage in the Lower Arkansas River Valley, 1978–2022.

How We Estimate Economic Impacts

To estimate the economic impacts of irrigated acreage loss, we use an input-output modeling framework that captures how changes in agricultural production affect the broader regional economy. The analysis is based on data from the USDA Cropland Data Layer, USDA NASS, Colorado State University Extension enterprise budgets, and IMPLAN economic accounts. We focus on the historical average decline in irrigated acreage in the Lower Arkansas River Valley, which is approximately 3,043 acres per year, based on USDA NASS data. These reductions in irrigated acreage are translated into losses in crop production and farm revenue, which are then used to estimate broader impacts on businesses, employment, and household income throughout the region.

Scenarios of Irrigated Acreage Loss

To evaluate how irrigated acreage loss affects the regional economy, we consider two alternative scenarios that differ in how acreage reductions are distributed across crops.

Scenario 1
Irrigated acreage losses are distributed proportionally across all major crops based on their share of total irrigated acreage in the region.

Scenario 2
All irrigated acreage losses are concentrated in alfalfa production, representing a scenario in which losses occur in one of the region's most important crops.

Economic Impacts of Irrigated Acreage Loss

The loss of irrigated acreage results in measurable economic impacts across the Lower Arkansas River Valley. Under Scenario 1, an annual reduction of approximately 3,043 irrigated acres is associated with a decline in regional economic activity of about **$4.38 million per year**, or roughly **$1,439 per acre**.

Under Scenario 2, where losses are concentrated in alfalfa production, total annual economic impacts increase to approximately **$4.87 million**, or about **$1,601 per acre**. These results highlight the importance of crop composition in determining the magnitude of economic losses.

In addition to direct losses in agricultural production, reductions in irrigated acreage generate broader economic impacts through supply chains and household spending. These indirect and induced effects extend to local businesses, input suppliers, and service sectors across the region. Figure 3 summarizes the distribution of total economic impacts between irrigated agricultural sector losses and broader economy-wide spillover effects under each scenario.

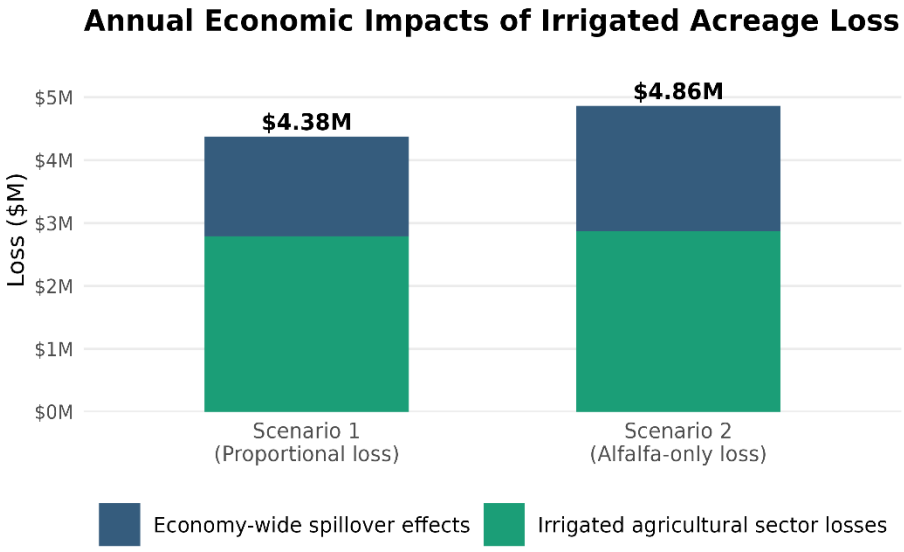

Figure 3: Estimated annual economic impacts of irrigated acreage loss under two scenarios.

Conclusion

Continued losses of irrigated acreage in the Lower Arkansas River Valley have meaningful economic consequences for the region. While irrigated land represents a relatively small share of total acreage, it supports high-value agricultural production and plays an important role in the regional economy. The findings suggest that even modest annual reductions in irrigated acreage can lead to measurable declines in economic activity. These results highlight the importance of considering the broader economic impacts of water transfers from agriculture to other uses.

Data Sources

- USDA National Agricultural Statistics Service (NASS)
- USDA Cropland
- IMPLAN Economic Data
- Colorado State University Extension Enterprise Budgets