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SOME ECONOMIC IMPACTS OF RETIRING WELLS IN THE THREE MILE CURTAILMENT ZONE

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Introduction

Northeast Colorado's Republican River Basin includes all of Phillips and Yuma counties and those portions of Kit Carson, Lincoln, Logan, Sedgwick, and Washington counties that overlie the Ogallala Aquifer. Colorado's semi-arid "high plains" have proven fertile for agricultural production, given adequate irrigation. Yet, groundwater development has been shown to reduce flows in the Republican River and its tributaries. The surface water flows of the Republican River are administered by interstate compact, and as the result of a recent settlement, Colorado will be asked to reduce groundwater pumping to ensure compact compliance. It is estimated that an additional 31,000 irrigated acres will be fallowed to meet compact compliance.

This study analyzes the regional economic impact of a loss of just over 31,000 irrigated acres in the portions of Kit Carson and Yuma counties that lie within a 3-mile radius of the Republican River and its tributaries. The study area is comprised of the following nine zip-codes: Burlington (80807), Stratton (80836), Eckley (80727), Wray (80758), Bethune (80805), Yuma (80759), Idalia (80735), Kirk (80824), and Joes (80822).

The next sections of this paper describe the economic and agricultural demographics of the study area, followed by the results of the economic impact analysis.

Economic Profile

The area is home to 15,683 residents. The average unemployment rate in the region is 2.9 percent. Employment and earnings are concentrated in the agricultural and related industries. Annual value of sales and services of the study area is just over \$1,760 million, with agriculture industries comprising \$895 million (51 percent) of this value. There are few economic alternatives to agriculture in the area and the counties are heavily dependant on agriculture for their economic base. Areas relying more exclusively on irrigated agriculture for economic activity, such as the nine-zip-code area considered here, are likely to suffer greater impacts from a loss of irrigated agriculture versus regions with a broader, more diverse economic base. Table 1 lists the major industrial sectors of the study area.

Agriculture

Agriculture has been a major influence on both past trends and present conditions in almost every area of socioeconomic concern because the area is located in

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Table 1: Economic Demographics for the Nine-Zip-Code Area (2006)

Industry	Output (million \$)	Output as % of Total	Employment
Cattle ranching and farming	351.0	22.8%	964
Irrigated Crops	255.1	16.6%	1270
Animal production- except cattle and poultry	69.3	4.5%	460
Waste management and remediation services	67.2	4.4%	75
Wholesale trade	58.2	3.8%	522
Oil and gas extraction	54.4	3.5%	146
Owner-occupied dwellings	46.8	3.0%	0.0
Drilling oil and gas wells	43.6	2.8%	48
Scenic and sightseeing transportation	40.9	2.7%	55
Monetary authorities and depository credit	37.0	2.4%	200
Pipeline transportation	31.1	2.0%	55
State & Local Non-Education	27.7	1.8%	580
Total	1,539	100.0%	12,503

one of the most agriculturally productive regions of the U.S. The area's agricultural output has both regional and national significance [5]. As Figure 1 shows, the total combined land area of the region is 4,527 square miles (2,897,280 acres), with 90 percent of this land in farm and ranch. Of the land in farm and ranch, 60 percent is cropland. Of the cropland, 25 percent is irrigated cropland and 75 percent is dryland. Dryland farming is still common with wheat as the primary dryland crop. The introduction of irrigation from both surface and ground water sources has diversified crops and increased livestock production. It has also stabilized the population by reducing the effect of droughts and floods. Corn, alfalfa hay, and wheat are the main irrigated crops grown today. Grazing lands are utilized for beef cattle. Agriculture continues to be the dominant economic sector in the basin. Table 2 lists the value of sales by crop.

Historically, the productivity of irrigated lands has contributed to the economic and social well-being of the area. Communities throughout the region depend on the agricultural sector for their economic base and

stability. The productivity of these lands contributes to individual operators' standard of living, as well as supporting employment opportunities on and off the farm.

Results

This analysis used the IMPLAN software program to create an input-output model of the region and to simulate the conversion of 6,240 acres of alfalfa and 24,960 acres of corn grain to grassland. The total economic impact from a reduction in irrigated acres is composed of three types of impacts:

1. Direct impacts: Changing production of Irrigated crops resulting in decreased revenue flow from the sale of those crops.
2. Indirect impacts: As irrigated agriculture changes in size and scope, its demand for inputs provided by other industries, will also experience different revenue flows. For instance, if a farmer reduces his production of irrigated crops, he/she will demand less fertilizer, seed, etc. from the industries that supply those inputs.

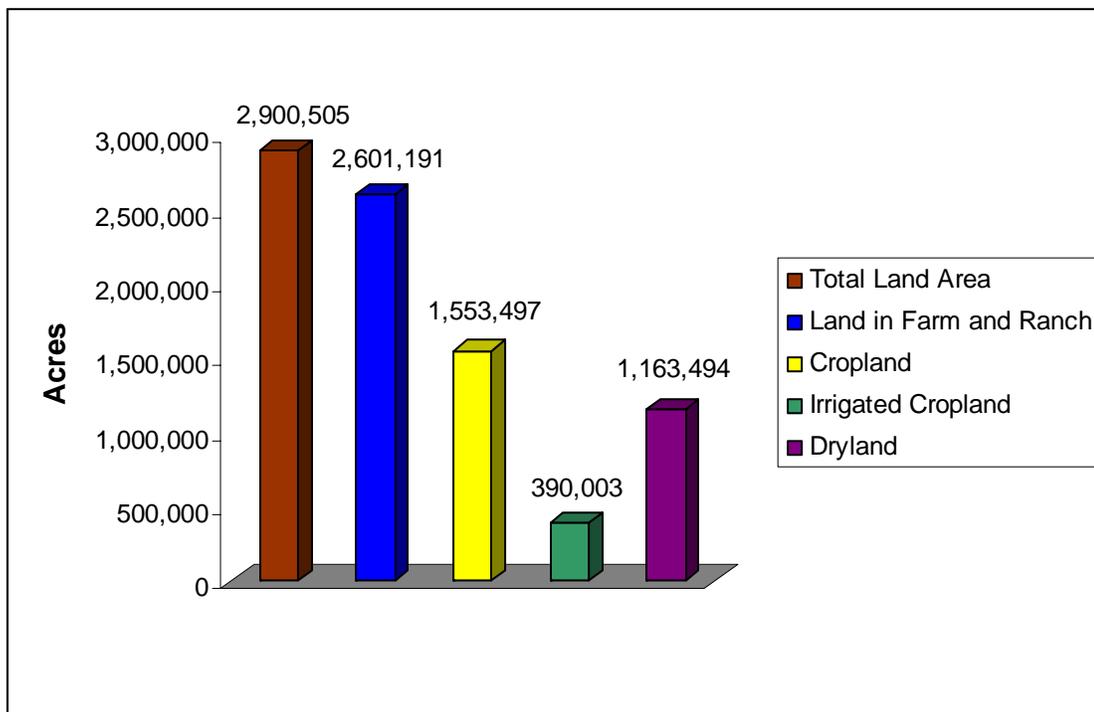


Figure 2: Land Disposition of Kit Carson and Yuma Counties

Table 2: Harvested Acres and Value of Sales by Crop for Kit Carson and Yuma Counties (2006)

Gross Irrigated Sales	Harvested Acres	Total Output
Alfalfa	44,300	\$32,405,450
Corn Grain	286,000	\$200,772,000
Wheat	47,300	\$10,905,110
Corn Silage	7,000	\$3,696,000
Sugarbeets	7,200	\$7,350,912
Total	391,800	\$255,129,472

- Induced impacts: Changing crop production activity leads to altered demand for labor inputs. As an example, the income loss associated with decreased employment leads to a reduction in spending attributed to wages.

The total economic impact is estimated to be over \$25 million. The sectors projected to experience the greatest economic impact in terms of lost output are listed in Table 2, while the sectors projected to experience the greatest economic impact in terms of employment are listed in Table 3. The economic activity generated per acre was calculated to be \$824.

Property Tax Revenues

When irrigated land is fallowed by government action, it is appropriate to reclassify the fallowed land in its new use. The new use (generally grassland or dryland crop production) generates lower profits in subsequent years, and the market value of the land, in its new use, declines. As a result, the assessed value of land falls, and so too does the tax revenue stream to the school district and local government. As a result, it is important to quantify how the retirement of irrigation wells will impact the local tax base.

Table 2: Output Impact by Sector

Sector	Direct	Indirect	Induced	Total
Irrigated Crops	-\$22,086,480	-\$241,494	-\$3,435	-\$22,331,410
Wholesale trade	\$0	-\$527,852	-\$124,193	-\$652,045
Agriculture and forestry support activities	\$0	-\$381,775	-\$355	-\$382,130
Owner-occupied dwellings	\$0	\$0	-\$289,686	-\$289,686
Cattle ranching and farming	\$0	-\$178,934	-\$15,922	-\$194,856
Monetary authorities and depository credit interme	\$0	-\$87,350	-\$69,675	-\$157,024
Oil and gas extraction	\$0	-\$99,453	-\$16,793	-\$116,246
Other State and local government enterprises ²	\$0	-\$74,476	-\$23,578	-\$98,053
Real estate	\$0	-\$87,127	-\$9,278	-\$96,405
Food services and drinking places	\$0	-\$4,600	-\$88,317	-\$92,916
Total	-\$22,086,480	-\$2,279,164	-\$1,326,600	-\$25,692,245

Table 3: Employment Impact by Sector (full-time and part-time jobs)

Sector	Direct	Indirect	Induced	Total
Irrigated Crops	-121.2	-1.5	-0.0	-122.7
Agriculture and forestry support activities	0.00	-14.3	-0.0	-14.3
Wholesale trade	0.00	-4.7	-1.1	-5.9
Food services and drinking places	0.00	-0.1	-2.1	-2.3
Nursing and residential care facilities	0.00	0.0	-1.0	-1.0
Food and beverage stores	0.00	-0.0	-0.9	-1.0
Hotels and motels- including casino hotels	0.00	-0.4	-0.5	-0.9
Social assistance- except child day care services	0.00	0.0	-0.9	-0.9
Civic, social, and professional organizations	0.00	-0.5	-0.4	-0.9
Monetary authorities and depository credit	0.00	-0.5	-0.4	-0.9
Total	-121.2	-27.3	-15.2	-163.7

The appraised value of agricultural land is generally based on a crop rotation (e.g., corn and alfalfa), and the owner's share of profits generated from the crop rotation. Profits are capitalized at a statutory rate of 13%. The assessed value of irrigated land is set by state statute as 29% of the appraised value. In 2005, the average appraised value of land was \$64.36 per acre for Yuma County and \$60.39 for Phillips county. Based on these appraised values, the county service taxes are approximately \$1.48 per acre on average, and school service taxes are generally the same amount. On average, approximately \$3.00 per acre will be lost from the county service and school revenue tax base. When measured across the proposed fallowed area, \$93,000 of county service and school tax revenues will be lost each year.

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² Other state and local government enterprises include sanitation, sewerage, water supply, gas supply, airports, water transportation and terminals, housing and community development, and liquor stores.