The University of Georgia

Center for Agribusiness and Economic Development

College of Agricultural and Environmental Sciences

The Economic Importance of Agriculture in the Eighteen County Flint River Basin of Georgia -Revised-

Brigid A. Doherty and John C. McKissick

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This report reviews the economic impacts of irrigated agriculture in the Flint River Basin of Southwestern Georgia[1]. Agricultural production in the eighteen Georgia counties considered in this report represents a significant portion of the area's total economy. It is of interest, therefore, to policy makers and citizens of Georgia to examine how agriculture affects the economic base of these counties and to explore the role of irrigation in the rural economy.

Agriculture in Georgia

Food, fiber and related industries as a sector account for 16 percent of total output and 15 percent of total employment in Georgia making them the largest single sector in the economy[2]. Farm and forest production sectors directly employed 87,269 people in 1995 and created $6.5 billion in output (Kriesel and Jones). Clearly, agriculture in Georgia is a significant portion of the state economy. Certain commodities form a strong base for agricultural activities in Georgia. The top value generators in Georgia agriculture have historically been broilers, forestry, cotton, peanuts and vegetables. These five commodities represented 67 percent of total farmgate value in 1998. Cotton and peanuts alone were 12 percent of farmgate value.

Agriculture in the Flint River Basin

Agricultural production in the Flint River Basin (FRB) counties represents a large portion of the state's agricultural production. The counties generate roughly 18 percent of the state's total agricultural value (see chart 1). The FRB region also contains 36 percent of total harvested crop acres in Georgia (1997 Census of Ag).

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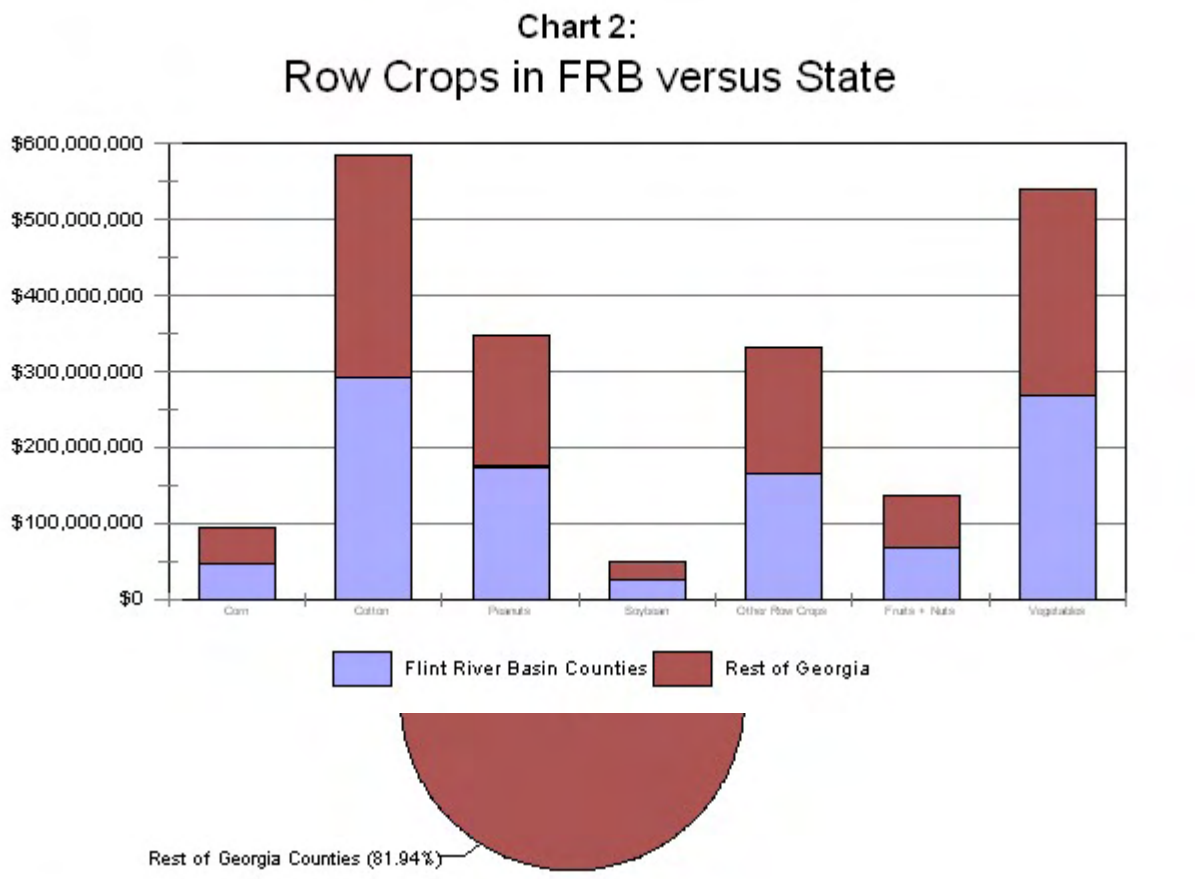
[1] These counties are: Baker, Calhoun, Colquitt, Crisp, Decatur, Dooly, Dougherty, Early, Grady, Lee, Miller, Mitchell, Randolph, Seminole, Sumter, Terrell, Turner and Worth.

[2] Includes agricultural inputs, agricultural production, agricultural processing and wholesale and retail food sales.

Source: 1998 Farmgate Value Report

As these figures show, the FRB counties are major contributors to the production of row crops in Georgia. These counties produce more than 40 percent of Georgia's value in corn, cotton, peanuts and vegetables (see charts 2 and 3). The FRB counties are responsible for

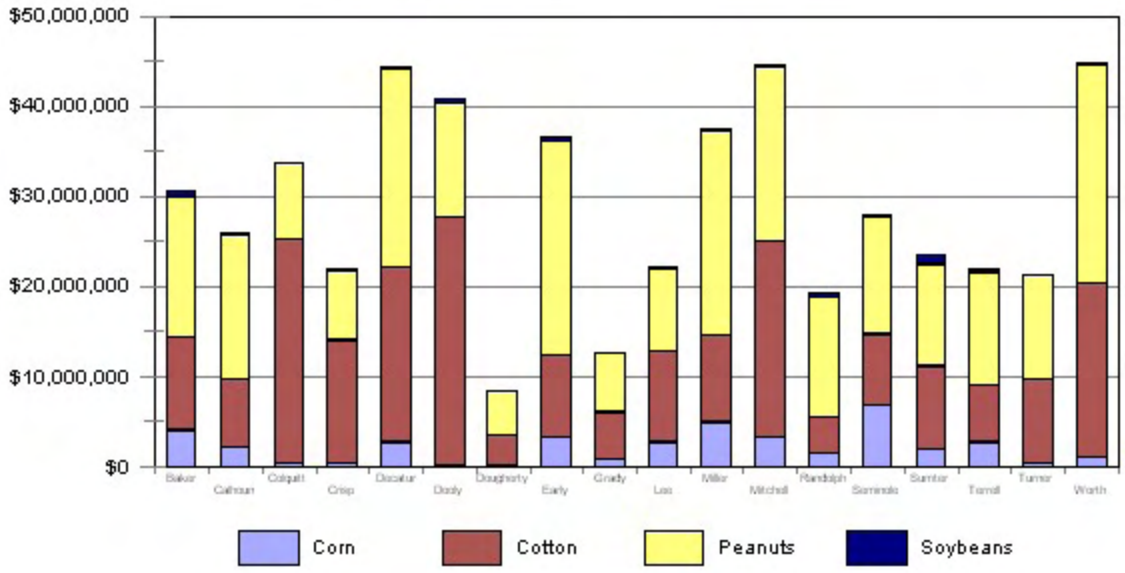


producing nearly 60 percent of the peanut value in Georgia. In addition, about 30 percent of fruit and nut production originates from this region.

Source: 1998 Farmgate Value Report

Chart 3:

Crop Production by County



The figures above account only for the income received by producers for agricultural commodities. Impact analysis is a method that accounts for the total economic contribution of a sector to the economy. Producers in the FRB received $1.4 billion for their agricultural products in 1998. As a result of their activities, a total of $2.1 billion of output was created in the FRB. In other words, had these agricultural activities in the FRB not occurred, the region

Source: 1998 Farmgate Value Report

would have lost $2.1 billion in economic activity. In addition, agriculture in the FRB generates, directly and indirectly, more than 25,000 jobs in Georgia.

Multipliers derived from economic impact analysis can be implemented to show the effects on output of a change in final demand (for example, consumption). Consider cotton as an illustration. The multiplier for cotton in the FRB is $1.52 (see appendix table 1). This multiplier can be interpreted as saying that for a $1 change in final demand, a $1.52 change will occur in

output. To clarify, consider a cotton producer in the FRB. Circumstances are altered and he produces one less dollar worth of cotton. This reduction in cotton production will not only affect the producer. He will purchase less seed, less fertilizer, and perhaps less labor. As he decreases his spending on fertilizer, for example, the company producing fertilizer will need fewer inputs and decrease their spending. The seed company and all other input suppliers will also begin to decrease their spending. The effect of a $1 decrease in cotton production ripples through the economy. The multiplier accounts for the decreased spending in other sectors. However, note the multiplier only accounts for the activity generated by the farmer purchasing inputs. It does not measure the value further generated in Georgia by processing the product. A dollar reduction in cotton production would also have serious impacts on cotton ginning, warehousing for storage, and so forth. In conclusion, the multiplier figures in appendix table 1 show that reducing agricultural production in the FRB will have an effect beyond decreasing the amount of value received by the producer.

Irrigation and Agriculture in the Flint River Basin

Producers in the FRB rely on irrigation as an integral input into the production of row crops. The 18 county region represents 36 percent of the state's total harvested crop acreage but has 54 percent of the total irrigated acreage in the state (see appendix table 2 and chart 4).

Source: 1997 Census of Agriculture

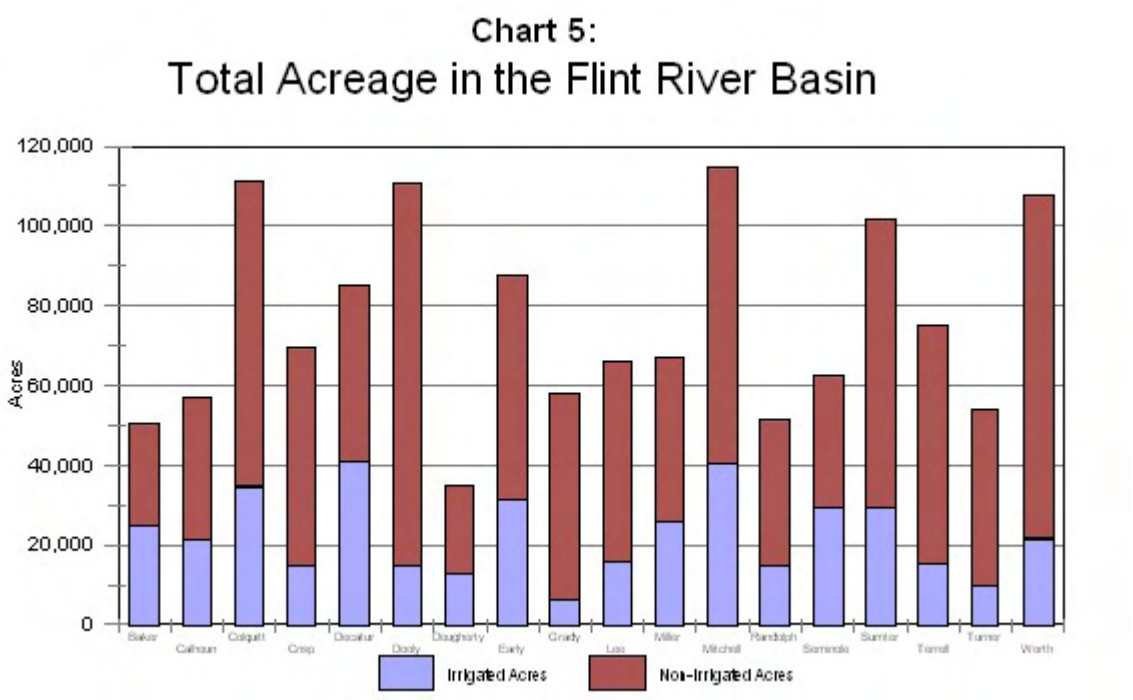
Roughly 30 percent of total harvested crop land in the 18 counties is irrigated. In certain counties, irrigated acres are almost 50 percent of total harvested crop land (see chart 5 and appendix table 3). Certain crops tend to be more highly irrigated than others. In 1997, 44 percent of total corn acreage in the FRB was irrigated, 27 percent of cotton, 10 percent of peanuts and more than 16 percent of soybeans.

Chart 4:
Total Irrigated Acreage in Georgia

Source: 1997 Census of Agriculture

Irrigation's Impact

Figures available from the 1997 Census of Agriculture can be utilized to show losses that



would have accrued to producers if irrigation water in the FRB had been unavailable. To illustrate, consider corn yield, acreage, and value in 1997. Irrigated corn yields in Georgia averaged 141 bushels per acre in 1997 while dryland corn yielded 85.3 bushels per acre (see appendix table 4). This is a difference of 55.7 bushels per acre. There were approximately 65,000 acres of irrigated corn in the FRB in 1997 (appendix table 5). If the 65,000 acres of irrigated corn had been left unirrigated in 1997, farmers would have realized a loss of roughly 3,600,000 bushels

of corn. The season average price of corn in 1997 was $2.90 a bushel. Thus, more than $10 million of revenue would have been lost to producers had they been unable to irrigate. This procedure can be repeated for each of the major row crops in the FRB. Summing the losses by crop leads to a total figure of $53,820,650 in total revenue lost for 1997 (appendix table 5). Stated another way, irrigation in the FRB generated an additional 53 million dollars in revenue to producers in 1997.

The detailed data needed for this type of analysis is available only from the Census of Agriculture making 1997 the sole observation year. The figures in the above paragraph (particularly the yields and numbers of acres irrigated) can be greatly affected by the weather conditions and precipitation levels. Obviously, irrigation will have a greater impact on yields and therefore provide more value to the producer in years of low rainfall. According to the 1998 Georgia Agricultural Facts, the FRB received above normal amounts of rainfall in 1997. In fact, adequate precipitation contributed to "Georgia's record corn yield" in 1997 (Georgia Ag Facts). The weather context reveals that in drier years yields on corn, cotton and peanuts will average lower. Thus, the gap between irrigated yields and dryland yields will be larger. This will further increase the losses to producers without access to irrigation water.

Returns to Irrigation in Average Growing Conditions

A method to analyze the effect of irrigation on profitability and returns is to utilize data available from the Georgia Cooperative Extension Service's *Crop Enterprise Cost Analysis* which are popularly known as the Extension Budgets. These budgets are based on best management practices and similar sized operations. They include estimates of expected yield, variable costs, and fixed costs for both dryland and irrigated crops. The figures in the Extension Budgets

"represent inputs and expenditures considered necessary to achieve the stated yields." A five-year average price was estimated that included the Loan Deficiency Payment (LDP). This price was multiplied by both the dryland yield and the irrigated yield to arrive at a revenue figure for both scenarios. Variable costs were then subtracted from revenue to arrive at a return over variable cost figure for both dryland and irrigated versions of the crop. The difference between the return over variable costs for dryland and irrigated land is the amount of net return a producer with an established irrigation system would forgo by not irrigating in an average growing season.

As an example, consider peanuts. Appendix table 6 shows dryland peanut acreage at 1.25 tons per acre and irrigated peanut acreage to be 1.75 tons per acre. The five-year average price for peanuts is $580 a ton. For dryland growers, this means a revenue of $725 per acre. At the same time, variable cost per acre is $418.54. This translates into a return over variable cost of $306.46 an acre for dryland producers. For irrigating producers, revenue is $1,015 per acre with a variable cost of $465.47 an acre. This yields a return over variable costs of $549.54. Therefore, producers who irrigate have a $243.07 higher return over variable costs than dryland farmers based on the Extension budgets. Using a similar analysis, irrigated net returns over dryland net returns are $150.80 for corn, $153.55 for cotton and $106.40 for soybeans (see table 1). Irrigation is considered a prerequisite for vegetable production so this analysis was not performed for vegetable producers. Variable costs are used first to illustrate the scenario of a producer who already has irrigation equipment (a fixed cost) and does not use it in a particular year. Total costs can be substituted to show how returns would be affected for a producer who is considering installing an irrigation system (net returns over total cost).

Table 1: Irrigated Crop Net Returns Over Dryland Net Returns

Commodity	Net Return over Var. Cost	Net Return over Total Cost
Corn	$150.80	$59.55
Cotton	$153.55	$94.55
Peanuts	$243.07	$152.57
Soybeans	$106.40	$16.40

Conclusions

This report has demonstrated the economic importance of agriculture in the eighteen counties of the Flint River Basin. The major commodities of agricultural production are crops including cotton, peanuts and vegetables. These crops are relatively dependent on irrigation, reflected in the high amounts of land in irrigation in the region. It was shown that in a relatively good growing year (1997), FRB producers would have lost $53 million in revenue had they been unable to irrigate. In addition, from extension budgets, it can be shown that a peanut producer with an established irrigation system will need to be compensated $243.07 an acre to not irrigate, a cotton producer $153.55, a soybean producer $106.40 and a corn producer $150.80.

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The Center for Agribusiness & Economic Development

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>
> To provide agricultural, natural resource, and demographic data for private and public decision makers.

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Or contact:

John McKissick, Director
Center for Agribusiness and Economic Development
Lumpkin House
The University of Georgia
Athens, Georgia 30602-7509
Phone (706)542-0760
caed@agecon.uga.edu

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