

## **Economic Analysis of Water Conservation in Irrigated Agriculture: Findings from the Rio Grande**

### **ABSTRACT**

Population growth, climate change, drought, and growing environmental values of water are increasing demands for water in the Rio Grande Basin. Irrigated agriculture is the basin's largest water user, and offers the greatest potential for water conservation. To date, a lack of reliable data on the economics of water conservation in irrigated agriculture has made it difficult to identify cost effective measures for promoting water conservation in irrigated agriculture. The objective of this study is to conduct an economic analysis of water conservation in irrigated agriculture for the Rio Grande Basin of North America based on examining irrigators' responses to various potential public subsidies of drip irrigation. A farm income optimization model is developed and calibrated to produce acreages that match observed acreages under current economic conditions. Model calibration is achieved by ensuring that profit maximization produces outcomes consistent with observed data on cropping patterns, water use, irrigation technology, input and output prices. Findings show that irrigators will invest more heavily in water conservation with higher crop prices, lower production costs, a lower price of water, and a lower cost of water-conserving technologies. Results of the farm income optimization model can inform the design of water conserving policies for irrigated agriculture. They can also provide information to policymakers who need to formulate cost-effective water-conserving policies for irrigated agriculture.

**Keywords:** Irrigation efficiency; Economic efficiency, water conservation, irrigated agriculture