



## TR-125

### Pricing and Conservation of Irrigation Water in Texas and New Mexico

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Two possible policy alternatives for management of limited water supplies in arid portions of Texas and New Mexico were analyzed for economic feasibility. Detailed studies of the potential impact of a water accumulation policy for each of two irrigation districts (El Paso County Water Improvement District No. 1 in Texas, and the Elephant Butte Irrigation District in New Mexico) were undertaken using temporal linear programming techniques. Current cropping practices, soils, groundwater conditions, historical surface water allocations for Elephant Butte Reservoir and evaporation rates were incorporated within the analysis. Estimates of the benefits of accumulation of surplus portions of irrigation district member's annual surface water allocations, with subsequent use of the unevaporated portion in later years, were deemed insufficient to cover anticipated administrative costs of implementing the proposed policy. This suggests current allocations approximate a temporal optimum. Sensitivity analyses showed greater potential benefits, however, if current groundwater conditions worsen.

Additional analysis of possible price-induced water conservation for the areas within the two states currently mining groundwater from the exhaustible Ogallala aquifer was also undertaken. The High Plains of Texas served as the representative region of study, with results assumed to be analogous for the portions of Eastern New Mexico relying on the Ogallala. Both static and temporal effects of a per unit tax on water pumpage and net returns were examined using a recursive linear programming model. Results indicated that imposition of a \$20 per acre-foot tax on water pumped induced very little change in water use over a 40 year period, while reducing the present value of producer net returns from 9% to 27% depending upon initial groundwater conditions and the irrigation technology in use. These results imply that a price induced water conservation policy for the Ogallala is not economically justified.

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