

WHY SHOULD UTILITIES PRACTICE WATER CONSERVATION? PERSPECTIVE FROM A SMALL WATER UTILITY

Jeffrey L. Jordan

AUTHOR: Chairman of Spalding County Water Authority and Associate Professor, Dept. of Agricultural and Applied Economics, University of Georgia Experiment Station, Griffin, Georgia 30223.

REFERENCE: *Proceedings of the 1993 Georgia Water Resources Conference*, held April 20 and 21, 1993, at The University of Georgia, Kathryn J. Hatcher, Editor, Institute of Natural Resources, The University of Georgia, Athens, Georgia.

INTRODUCTION

When I first asked members of the Spalding County Water Authority to consider changing the system's rate structure to promote water conservation, the reaction was; "Why do we want people to use less water? We need revenues." Judging from recent state and nationwide statistics, this view remains common. The Georgia Environmental Facilities Authority has estimated that 85% of the rate structures in the state have declining per unit costs to users --- the more water a household or business uses, the cheaper it gets. Results from the American Water Works Association's Water Industry Data Base indicate that 40% of the utilities surveyed nationwide have declining block rates and 44% use a uniform rate structure; only 16% use conservation pricing schemes.

Water rates that decline with use have traditionally been used to attract industry and promote water use for revenue gain. However, as population pressures continue, it will no longer be wise to use cheap water as an economic development or revenue tool.

In Georgia, there are 581 community water systems operating under license from the Environmental Protection Division. Of those, 95% serve less than 10,000 customers, and 65% serve less than 1,000. Consequently, if water conservation is to be achieved in Georgia, it will be small water utilities who will need to balance conservation goals with revenue needs. The purpose of this presentation is to discuss why small water utilities should practice water conservation, particularly through changing rate structures.

WHY WATER CONSERVATION?

Although Georgia normally has abundant rainfall, it has recently experienced serious droughts. Further, as population pressures increase in North Georgia, particularly around Atlanta, there will be a need for more water sources. However, the ability of state and local governments to locate and afford these new supplies is in doubt. Also, while groundwater is available in North Georgia, it is difficult to find and expensive to utilize.

Rather than relying on new water supplies alone,

utilities need to view water conservation as "capacity without construction." Recently, when planners faced a water supply problem in Elmhurst, Illinois, they developed a new well costing \$400,000. However, a conservation program costing \$50,000 saved the same amount of water that was supplied by the well. Saving water reduces the need for utilities to rapidly increase the size of their facilities. By reducing water demand today, expansion can be pushed into the future. Further, as the recent Safe Drinking Water Act becomes effective, the cost of meeting those standards will greatly increase water rates. Keeping demand down will reduce the explosion in the cost of supplying high quality water.

WHY CONSERVATION PRICING?

This section will examine the economics of using pricing structures to both reduce water demand and raise utility system revenues. Water is an inelastic good. Since few substitutes exist (with the exception of using less) when the price of water goes up, consumption goes down, but not by as much as the price increase.

Water utilities in Georgia and the U.S. most often use a uniform rate structure. An example would be a utility with 100 customers, all paying \$2.00 per thousand gallons of water. Table 1 shows a typical breakdown of the customers, water use and revenues for this type structure. In this small system, 971,250 gallons of water are used producing revenues of \$1,942.50.

**Table 1. Water Use and Revenues -
Uniform Rate Example**

Number Customers	Average Use per Month in Gallons	Total Water Use in Gallons	Average Monthly Bill	Total Revenue
80	8,000	640,000	\$16.00	\$1,280.00
5	9,250	46,250	\$18.50	92.50
5	14,000	70,000	\$20.00	140.00
5	20,000	100,000	\$40.00	200.00
5	23,000	<u>115,000</u>	\$46.00	<u>230.00</u>
Total		971,250		\$1,942.50

Table 2 illustrates a rate structure where customers pay a higher rate for increased water use. For most of this hypothetical system's customers -- those that use 8,000 gallons or less -- no change in their water bill is imposed. This water rate structure would not affect the small user or those with low incomes.

For those using more than 8,000 gallons per month, their rates would increase. The demand for water declines, but not by as much as the increase in rates -- the definition of inelastic demand.

The result of the new structure? Table 3 shows that total water use would decline from 971,250 gallons to 940,000. Revenues, however, would increase from \$1,942.50 to \$1,974.50.

At the same time, water demand can be reduced while revenues can increase. In effect, an increasing rate structure does this by forcing the heavy users of water to pay a higher price which more than offsets the reduced revenues from the conserving water users.

The Spalding County Water Authority instituted an increasing rate pricing structure on January 1, 1991. Most of the customers continue to pay the old rate of \$1.70 per thousand gallons. The rates were increased so that large users pay up to \$2.20 per thousand gallons.

In 1991, the number of customers increased 6% and water use went up only 1%. In fact, the per customer water use dropped 5%, while total revenue increased 21%.

Table 2. Increasing Rate Structure

Cost of Water per 1000 Gallons	Use Level in Gallons	% Increase in Rate	% Decline in Demand
\$2.00	0 - 8,000	0	0
2.10	8,000 - 10,000	5	3
2.20	10,000 - 16,000	10	7
2.30	16,000 - 20,000	15	10
2.50	20,000 & above	20	15

Table 3. Results of Increasing Rate Structure

Number Customers	Average Use per Month in Gallons	Total Water Use in Gallons	Average Monthly Bill	Total Revenue
80	8,000	640,000	\$16.00	\$1,280.00
5	9,000	45,000	\$18.90	94.50
5	13,000	65,000	\$28.60	143.00
5	18,000	90,000	\$41.40	207.00
5	20,000	<u>100,000</u>	\$50.00	<u>250.00</u>
Total		940,000		\$1,974.50

CONCLUSION

Using an increasing rate structure, and other conservation programs, small water utilities can both reduce water demand and increase revenues. As with any pricing system, the key is to design the rate structure carefully, using accurate information on rates and water use per customer.