



Public Policy Review

by Sharon Megdal

Water Pricing Has Potential to Promote Water Conservation



The pricing of water is an interesting and important topic. The rates water utilities charge are designed to recover the cost of delivering water to customers. That means water prices generally cover the costs of the construction, maintenance and operation of the water delivery infrastructure, from pipelines to dams and canals. Also included are costs of all administrative functions,

from meter readers to outside consultants and lawyers. Yet, no cost is associated with the water molecules themselves. This is true for groundwater, surface water and effluent.

For most goods and services, the price system usually is viewed as a mechanism for allocating scarce resources. Water stands out as an exception, its pricing not generally incorporating a scarcity value of water, despite a general awareness that water is in fact scarce. Water is not sold at a market-clearing price for several reasons. This is partly due to our legal system governing water rights and ownership. It is also due to the general belief that water should not be treated like other commodities, with private interests owning and then selling it at whatever the market-clearing price may be. This may seem paradoxical, and, in fact, introductory textbooks in economics identified the diamond-water paradox years ago. Diamonds are not a necessity but are very expensive whereas water is essential for life but is often free for the taking. The paradox can be explained by the relative scarcity of the two goods. Water has been relatively plentiful relative to demand while diamonds are very scarce and costly to produce.

Due to growing local, national and global populations, fresh water is not plentiful in many locations. In the West, many communities must seek new, often expensive water supplies to serve rapidly growing populations. We see officials imposing water resource fees related to providing water and entering into water transactions to secure necessary water supplies.

Drought has heightened Arizonans' awareness of the imbalances of water supplies relative to demand. Having sustainable state water supplies means acknowledging and addressing actual and potential imbalances between long-term demands and supplies. Work on long-term water balances region-wide has been underway in the Active Management Areas for some time; in other areas work is just beginning.

Using price signals to assist with demand management is not a new concept. A pump tax to discourage groundwater use has been often proposed, and the adoption of conservation rate structures has been advocated and in many cases adopted.

Active Management Areas have a modest groundwater withdrawal fee, established initially to provide funding for the Arizona Department of Water Resources and for conservation and augmen-

tation programs. Statutory change diverted the first component to the general fund. A large portion of the second component funds banking of Colorado River water. Utilizing a groundwater withdrawal fee to discourage groundwater use, however, has not been generally embraced. Governor Hull's Water Management Commission raised the issue but recognized that a significant tax on water would adversely affect certain industries, especially agriculture. Yet, even if it did not apply to all industries, a pump tax could further the goal of reducing water consumption. Designed carefully — for example, it would have to address concerns regarding low-income water ratepayers — a groundwater use surcharge could effectively reduce water consumption, as well as help fund much-needed infrastructure investments or other programs, such as the Arizona Water Protection Fund.

More is at issue, however, than discouraging only groundwater use. Even communities with ample renewable water resources are concerned about a future demand-and-supply imbalance. In emphasizing the need for a statewide "culture of conservation," Governor Napolitano notes this may mean different things to different communities. Work on the effectiveness of different conservation methods is ongoing, and the installment and use of graywater systems and the increased use of effluent has been highlighted. Another viable means of achieving reductions in water usage is through water pricing.

Adopting rate structures to encourage water conservation is increasing, by water companies governed by cities and towns as well as companies regulated by the Arizona Corporation Commission. Predicting the effectiveness of this tool is a complex task due to the price elasticity and income elasticity of demand as well as the nature of the use itself (e.g., indoor versus outdoor use).

If demand for water is price-inelastic, i.e., if the percentage reduction in water use is less than the percentage increase in price, economic models indicate that utility revenues will increase. What then is to be done with the "windfall" or increased revenues? Recovering only the cost of service would require an offsetting rate reductions somewhere in the system. As previously suggested, however, the "windfall" revenues could fund infrastructure or riparian restoration projects, which are attracting increased interest. If demand for water were price-elastic, which according to most studies is not yet the case, reduced revenues would be the issue. In a system requiring revenues to cover at least the cost of service, this would have to be addressed. The task of predicting response to price changes is complex. Price elasticity estimates based on econometric models, where they exist, are considered predictive only for small changes in price. They cannot generally be used to predict behavioral response to large price changes.

Despite these complexities and the difficult equity, legal and other considerations, pricing tools should be in our water policy toolbox. ■■■