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California's Water "Shortage"

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As California's current drought¹ entered its fourth year, Governor Jerry Brown imposed mandatory state-wide water restrictions intended to drastically reduce water consumption.² The restrictions, a series of guidelines for rationing, rebates, and prohibitions aimed to reduce household and commercial water consumption (notably excluded is agriculture) by 25 percent. These policies are sure to miss the mark as they have when tried in the past.³

Several factors have aggravated California's current crisis, including low levels of precipitation⁴ the emptying of reservoirs to protect some aquatic wildlife,⁵ the melting of snow caps,⁶ and policies intended to stifle economic and population growth.⁷ These factors have all certainly diminished the supply of water. Meanwhile, California's population growth, though well below its pre-year 2000 pace due to net migration outflows, has remained positive. Population growth has certainly increased the demand for water in the state. However, these factors are not the cause of California's water crisis.

The cause of California's current water crisis is the absence of scarcity pricing based on the supply and demand of water. This is nothing new. As Dr. Laffer wrote in the midst of another major California drought back in 1991:

Using rice, cotton and alfalfa farmers as scapegoats for California's current water crisis is wrong. In fact, why anyone would describe California as having a water shortage is beyond me. The price of water is simply too low and the reason the price of water is too low is because government controls its distribution. It's as simple as that.⁸

Key Points

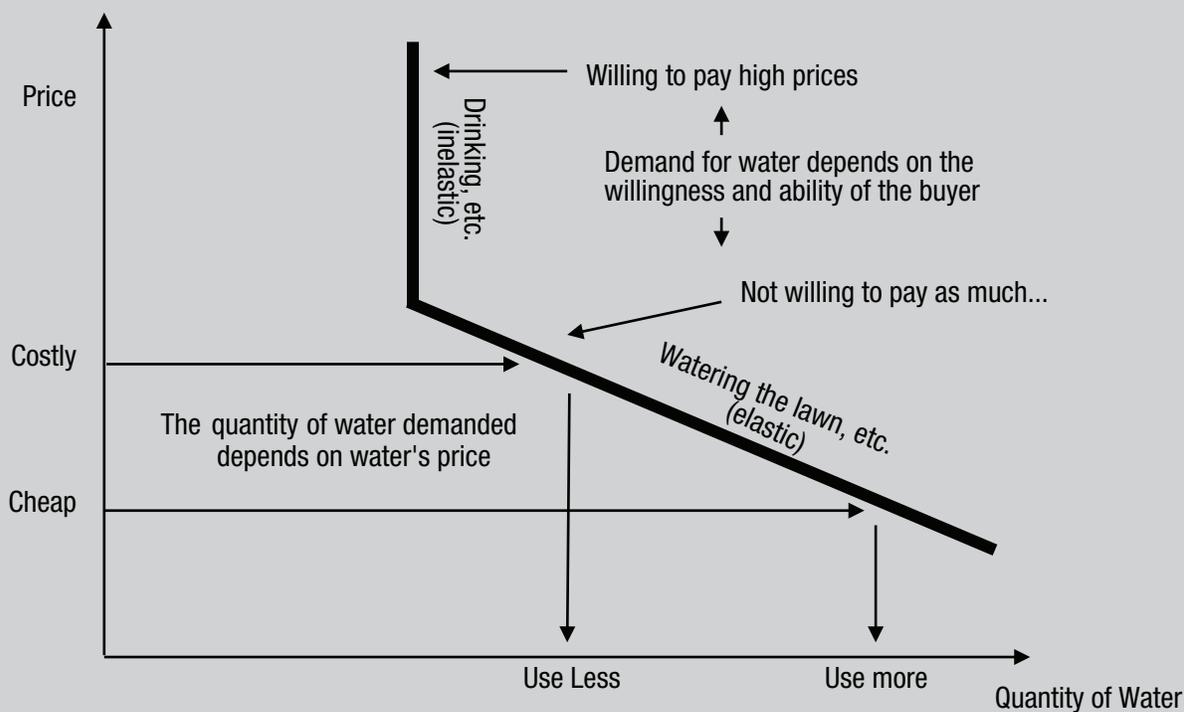
- Many commentators incorrectly identify California's historic draught, melting of its snow caps, or a handful of misguided policies as the cause of the state's current water crisis.
- The cause of California's current water crisis is the absence of scarcity pricing based on the supply and demand of water. This is as true today as it was when Dr. Laffer commented on California's water crisis in 1991.
- If California is to overcome its current water crisis, it must introduce scarcity pricing based on supply and demand. Once market pricing is implemented, recognizing property rights in water ownership could further alleviate the crisis, by facilitating trades in water supplies.

In a free market, the public's demand for water would be based on its willingness and ability to pay for water. The quantity of water demanded would depend on its price (see Figure 1). At high prices, the public would purchase less water and devote it to the most valued activities (such as drinking). For these activities, the public's demand is very inelastic, meaning it is very insensitive to price changes. The inelastic demand for water is illustrated by the vertical portion of the demand curve for water in Figure 1. High water prices also promote efficiency and conservation, and invite additional supplies to the market.

At low prices, the public demands greater quantities of water. Purchasing water for less valued activities (watering lawns, swimming pools, washing cars, etc.) becomes increasingly attractive as the prices of water falls. For less valued activities, the demand for water is elastic, meaning it is sensitive to prices. The elastic demand for water is indicated by the downward sloping demand curve in Figure 1. Low prices for water reduce the incentive for efficiency and conservation, and frequently result in waste.

California's public water prices are not determined by scarcity pricing, but by allocation-based conservation pricing intended to ensure broad access to water while providing economic incentives for conservation. This pricing method determines an "appropriate" amount of water usage for residences and businesses based on lot and/or building size, number of occupants, and/or other factors.⁹ In the event users exceed their monthly allocations, they pay higher rates for water.

Figure 1
The Demand for Water



However, California law mandates that water prices “shall not exceed the reasonable cost of water service including basic costs and incremental costs to charges for water use”.¹⁰ Customers do face higher costs for excess water consumption under allocation-based pricing, but the higher prices must still adhere to California law and be in keeping with the cost of water delivery. Even those who consume in excess of their allocation merely pay for the cost of delivery of the water, and thus, they still pay below-market prices for water. As a result, the public has little economic incentive to conserve water or reduce wasteful use.

In light of this policy, should we be surprised that many of California’s reservoirs are running dry,¹¹ and that farmers aren’t getting annual deliveries of water?¹²

To stem the crisis, the Orange County city of San Juan Capistrano introduced tiered pricing to incentivize conservation among its customers. While many supported the measure, including Governor Jerry Brown, a California appeals court deemed tiered pricing a violation of the state’s Constitution on the basis that some consumers were charged in excess of the water provider’s cost of delivery.¹³

Tiered pricing for water, however, is not the answer to California’s water crisis. As with allocation-based conservation pricing, a tiered pricing structure would have charged higher rates to those who consumed greater amounts of water. While appealing in theory, successful implantation of tiered pricing faces substantial practical problems. The tiers and rates are typically determined by political rather than economic interests.¹⁴ As a result, the practice can disproportionately benefit high-consuming water users and undermine conservation efforts.¹⁵ Uniform rates based on water scarcity are the optimal pricing method.

If California is to overcome its current water crisis, it must introduce scarcity pricing based on supply and demand. Once market pricing is implemented, recognizing property rights in water ownership could further alleviate the crisis, by facilitating trades in water supplies. This would ensure the market puts existing water supplies to the highest use. Appeals for voluntary conservation won’t work as intended;¹⁶ economic incentives are far more powerful and effective in achieving socially desirable results.¹⁷

While higher prices may be painful in the near-term, the market will adjust and give rise to new technologies that will aid conservation efforts, and in time, replenish California’s water supplies. With state water managers and experts around the country anticipating falling water supplies in the coming decade,¹⁸ California has an opportunity to use market principles to navigate its way out of its current water crisis and in the process, the state could serve as a model for the rest of the country in the future.

As we wrote back in 1991, advice which still rings true today:¹⁹

To minimize the damage from a prolonged history of abusive government interference the State of California should forthwith:

- Charge all farmers, government agencies, and other water users the same price for water, no exceptions. Everyone should have the same incentive to treat water with the respect it deserves.
- The price of water should be raised such that the average price charged is initially set at five times the current average price. Such a dramatic move would clearly get people’s attention. Because households are currently charged much more for water than are farmers, a higher average price in conjunction with one price for all consumers, would still mean a relatively small increase for households....

- Government should under no circumstances deprive the natural environment of its water set asides. Our forests, bays, rivers, and marshes already share the burden of drought with us and can ill-afford any additional deprivation by reducing water set-asides. These water set-asides are a small gesture reflecting the fact that other lifeforms share the planet with us.
- Lastly, if water usage doesn't fall below supplies at the new higher price, the price should be raised until it does. Once water usage falls below supplies and reservoirs of water are rebuilt then water prices should be adjusted continuously to balance supply and demand.

Of course, we've been singing the same tune for a long, long time. Maybe some day Sacramento will pick up the harmony. (Reprinted with permission from Laffer Associates).

Endnotes

- 1 Evidence suggests that 3 year draughts in Central and Southern California have been common occurrences throughout the last 1,200 years. However, the current draught is the most severe in that time due to “reduced though not unprecedented precipitation and record high temperatures”. For more information see: Daniel Griffin and Kevin J. Anchukaitis, “How unusual is the 2012-2014 California drought?” *Geophysical Research Letters: An AGU Journal*, December 30, 2014. <http://onlinelibrary.wiley.com/doi/10.1002/2014GL062433/full>
- 2 “Executive Order B-29-15”, State of California, Executive Department, April 1, 2015. http://gov.ca.gov/docs/4.1.15_Executive_Order.pdf
- 3 For more information see: Arthur B. Laffer, “A Responsible Solution to California’s Water Crisis”, A.B. Laffer, V.A. Canto & Associates, February 21, 1991, and, Arthur B. Laffer, “Defeating California’s Water Crisis”, *U-T San Diego*, May 2, 2012. <http://www.utsandiego.com/news/2012/may/02/defeatingcalifornias-water-crisis/>
- 4 Ibid.
- 5 Victor Davis Hanson, “California’s Water Wars: Environmentalist efforts to save the delta smelt threaten to create a new dust bowl”, *City Journal*, Summer 2011. http://www.city-journal.org/2011/21_3_california-water.html
- 6 Dennis Dimick, “Lack of Snow Leaves California’s ‘Water Tower’ Running Low”, *National Geographic*, March 4, 2015. <http://news.nationalgeographic.com/news/2015/03/150304-snow-snowpack-california-drought-groundwater-crisis/>
- 7 Jim Wood, “Stay CALM: Countering panic attacks from the Herbal Tea Party”, *Marin Magazine*, July 2014. <http://www.marinmagazine.com/July-2014/Stay-Calm/>
- 8 Arthur B. Laffer, “A Responsible Solution to California’s Water Crisis”, A.B. Laffer, V.A. Canto & Associates, February 21, 1991.
- 9 For an explanation on allocation-based water pricing, see: Irvine Ranch Water District, “Allocation-Based Conservation Rate Structure”, *Background Paper*. <https://www.irwd.com/images/pdf/rates/IRWDABCratesFAQ41415.pdf>
- 10 State of California, “Water Code Section 370-374”, Official California Legislative Information. <http://www.leginfo.ca.gov/cgi-bin/displaycode?section=wat&group=00001-01000&file=370-374>
- 11 Peter Bowes, “California drought: Will the Golden State turn brown?” BBC News, April 6, 2015. <http://www.bbc.com/news/world-us-canada-32196177>
- 12 Victor Davis Hanson, “California’s Water Wars: Environmentalist efforts to save the delta smelt threaten to create a new dust bowl”, *City Journal*, Summer 2011. http://www.city-journal.org/2011/21_3_california-water.html
- 13 Curtis Skinner, “California court rejects city’s tiered rates”, Reuters, April 21, 2015. <http://www.reuters.com/article/2015/04/21/us-usa-california-drought-idUSKBN0NC0GF20150421>
- 14 David Zetland, “How to price water for conservation in California”, *Aguanomics Blog*, April 21, 2015. <http://www.aguanomics.com/2015/04/how-to-price-water-for-conservation-in.html>
- 15 Ronald C. Griffin, James W. Mjelde, “Distributing water’s bounty”, *Ecological Economics*, 72, 2011. <http://ron-griffin.tamu.edu/reprints/GriffinMjelde2011.pdf>
- 16 Kurtis Alexander, “California drought: Voluntary cutback falls short in Bay Area”, *San Francisco Gate*, June 9, 2014. <http://www.sfgate.com/science/article/California-drought-Voluntary-cutback-falls-short-5538084.php>
- 17 Koichiro Ito, Takanori Ida, and Makoto Tanaka, “The Persistence of Moral Suasion and Economic Incentives: Field Experimental Evidence from Energy Demand”, *E2e Project Working Paper Series*, University of California, Berkeley. <http://e2e.haas.berkeley.edu/pdf/workingpapers/WP017.pdf>
- 18 “FRESHWATER: Supply Concerns Continue, and Uncertainties Complicates Planning”, United States Government Accountability Office, May 22, 2014. <http://www.gao.gov/products/GAO-14-430>
- 19 The 1991 paper also specified a transition protocol to allow an adjustment period during which the amount of water subject to market-pricing increased each year. Such a procedure could again be put in place today. See: Arthur B. Laffer, “A Responsible Solution to California’s Water Crisis”, A.B. Laffer, V.A. Canto & Associates, February 21, 1991.