



EERHPOLICYBRIEF

“Yes we can ...” : Getting serious about water pricing in Australia R. Quentin Grafton¹

Water matters; we know that. But what about the price we pay for it? The way water supply is managed in Australia is highly costly – it is high time we changed the way we price water in Australia.

Consumption and the volumetric water price

An average-income-earning household spends about one per cent of their total expenditure on their water bill. For low-income households it can be three or four times as much.

The price of water affects how much we consume. In turn, this helps determine supply in our dams and storages. The higher the volumetric (unit) price we pay per kilolitre of water, the less water we consume (all else being equal).

This negative relationship between price and consumption has been found in hundreds of residential water-demand studies conducted world-wide, including Australia. These studies show that if the price of water increases by 10 per cent, water consumption will decline by less than 10 per cent. According to an analysis of 64 previously published residential water demand studies, household water consumption would fall, on average, by about 3.5 per cent for a 10 per cent price increase (Dalhuisen et al. 2003).

Water demand is affected by household income, household size, garden size, weather, and the age of consumers. Unlike price, these household characteristics cannot be controlled by water authorities. Price as a control on water consumption is crucial during periods of drought and low inflows into catchments. If volumetric prices are not allowed to vary with water supply during such periods, the current demand for water can exceed supply.

Increasing block water tariffs

Instead of increasing volumetric prices to balance supply and demand in periods of drought, water authorities and governments in Australia and elsewhere have chosen to impose mandatory water restrictions to reduce consumption. Where authorities and governments have raised prices in Australia and overseas, it has often been through an ‘increasing block tariff’. This means if a household uses water above a given consumption threshold, it pays a higher volumetric price for its water. Although this appears to encourage water conservation an increasing block tariff has an unfortunate consequence – large and low-income households, who may have little choice about water use, pay a

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higher price for water than small and high-income households. Such pricing is inequitable. It is also inefficient because consumers who value an extra kilolitre of water more highly than someone else can end up using the same volume of water.

Mandatory water restrictions

Mandatory water restrictions are frequently defined by trigger points based on how much water is stored in the dams. Such restrictions are appropriate to cope with short-term and unexpected shocks to supply, such as when the 2003 bushfires damaged Canberra's catchments and affected water quality.

Mandatory water restrictions are neither an efficient nor a fair way to permanently control water demand. By rationing everyone's outdoor water-use, those people who value outdoor use highly (such as gardeners) are penalised. Yet there is no impact on others (such as those living in apartments).

Restrictions are inefficient. This is because consumers who would, otherwise, pay a lot to water, say, their magnolias, are unable to do so. So even if an avid gardener were to reduce her indoor water consumption by using water-savings devices and taking only two-minute showers, she would still not be allowed to water her garden using the outdoor water tap because of mandatory water restrictions. She might be fined, or even prosecuted, if she were to try to use any of her indoor savings for outdoor uses.

Costs of inefficient water pricing

Mandatory water restrictions cost households hundreds of dollars per year relative to efficient water pricing that returns revenues that exceed costs back to consumers in the form of lower fixed water charges (Grafton and Ward 2008). In Australia, the cost of mandatory water restrictions amounts to almost a billion dollars per year (Productivity Commission 2008, p. 28).

Inefficient water pricing has long-term costs for water consumers and taxpayers. Water prices are, typically, set three to five years in advance by a pricing regulatory authority. The prices are set to avoid 'monopoly pricing' by water suppliers who could take advantage of being a single-source supplier.

The regulated price is based on what the pricing authorities determine to be the extra cost of supplying additional water. Prices vary in this 'fixed price' approach only with the capital and operating costs associated with existing or just-augmented capacity, interest rates and inflation.

The problem with fixed pricing is it ignores the effect of weather on supplies. If there is a drought and reduced inflows into catchments and dams, then less water will be available.

With fixed pricing, the amount charged to consumers is unchanged and the price is set too low to balance demand and supply in dry years. To correct the imbalance, alternative measures (such as mandatory water restrictions) are used.

Where mandatory water restrictions have not been enough, or where on-going water restrictions have been considered too costly, investments to augment water supplies have been made. In Australia, this has resulted in billions of dollars invested in desalination plants. Perth, the Gold Coast and Sydney all have operational desalination plants. Melbourne and Adelaide will also soon have them.



If water prices had been set high enough during droughts, however, some of these desalination plants (such as Sydney's recently completed plant) would not have been needed.

Flexible water pricing

When dams have less water, and volumetric water prices rise, consumers receive a signal about the scarcity value of water. This helps reduce consumption when supplies are low resulting in longer lasting water storages. It also postpones the need for costly supply augmentation, such as desalination plants. If the low inflows into dams are temporary, as was the case in Sydney, it gives an opportunity for the water storages to fill up. Then, when dams are near full again, the volumetric prices can be lowered. This scarcity, or flexible, pricing reduces the average price paid over time for water by consumers (Grafton and Kompas, 2007).

Flexible water pricing can bring huge benefits for consumers in highly variable climates, (such as that experienced in Australia) and when the cost of augmenting water supply is high. Fixed pricing, on the other hand, means that as soon as a desalination plant is built, consumers pay for the high capital and operating cost of the plant whether water storages are full or not. We can do better. We should price water flexibly and remove many of the water restrictions that exist in most Australian cities.

Further reading

Dalhuisen, J.M., R.J.G.M. Florax, H.L.F. de Groot and P. Nijkamp (2003), Price and Income Elasticities of Residential Water Demand: A Meta-Analysis, *Land Economics* 79(2): 292-308.

Grafton, R.Q. and T. Kompas. (2007). Pricing Sydney Water. *Australian Journal of Agricultural and Resource Economics* 51(3): 227-241.

Grafton, R.Q. and M. Ward. (2008). Prices versus Rationing: Marshallian Surplus and Mandatory Water Restrictions. *The Economic Record* 84: S57-65.

Productivity Commission. (2008). *Towards Urban Water Reform: A Discussion Paper*. Productivity Commission Research Paper, Melbourne.

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