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Ensuring Singapore's water security is about pricing it right and more

Water demand is growing while supply uncertainties abound. Despite progress over the years, meeting our water needs remains a significant challenge.

Terence Ho

The centrality of water to Singapore's existence is best summed up by then Minister Mentor Lee Kuan Yew's remark in a 2008 speech that "every other policy has to bend at the knees for our water survival".

Safeguarding Singapore's water security over the long term requires proactive management of both demand and supply. It takes appropriate pricing, regulation, investment as well as innovation and partnerships to keep water usage efficient, sustainable and affordable.

On Wednesday, national water agency PUB announced an increase in the price of potable water by 50 cents per cubic m, to be implemented over 2024-25, due to the rising cost of producing and supplying water. This represents a 2.5 per cent per annum increase since the last price revision in 2017.

Water prices are adjusted less frequently than electricity tariffs and public transport fares. However, such updates are crucial for the sustainable management of a critical resource.

WATER SECURITY CAN'T BE TAKEN FOR GRANTED

In earlier decades, periodic threats by Malaysian politicians to cut off the water supply from Johor weighed heavily on Singapore's national psyche, creating a sense of vulnerability. The importance of water conservation was reinforced through public awareness campaigns and occasional water-rationing exercises.

Today, Singapore has four "national taps" comprising water from local catchment, imported water from Malaysia, reclaimed used water (called Newater), and water from desalination.

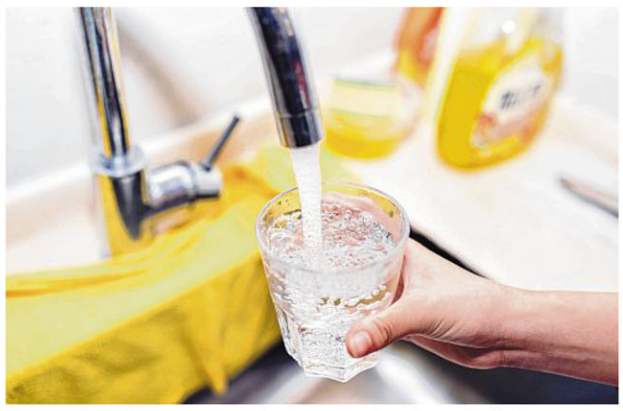
While Singapore's efforts to bolster its water security have made significant strides, complacency would be unwise. Total water consumption is expected to almost double between now and 2065, while Singapore's water agreement with Malaysia is set to expire in 2061. Furthermore, the evolving rainfall patterns driven by climate change, marked by extreme and prolonged droughts, will also affect the water catchment yield not just in Singapore but also in neighbouring regions.

Achieving sustainable management of water resources has presented formidable challenges across the globe. Thames Water, a private water company serving 15 million customers in the Greater London area and beyond, is grappling with a multibillion-pound funding shortfall for its ageing infrastructure which has resulted in leakages and untreated sewage polluting rivers. This led the British government to consider options to place the indebted utility company under administration.

A subsequent capital injection by shareholders has staved this off for now.

In mid-2018, Cape Town was on the brink of "Day Zero" – where the city would have been forced to shut down most of the municipal water supply. The underlying cause of this crisis was a prolonged drought, exacerbated by the failure to increase dam capacity to match the surging population growth experienced in the preceding decade.

The experiences of London and Cape Town are among the many global examples of threats to water security arising from deficiencies in water management or infrastructure investment. Similarly, it is no easy task to ensure that Singapore's water needs can continue to be met amid growing demand as well as the uncertainties surrounding supply.



Singapore's total water consumption is expected to almost double between now and 2065. Complacency would be unwise, says the writer. ST PHOTO: BRIAN TEO

RIGHT-PRICING WATER

The appropriate pricing of water is foundational for managing water demand and ensuring its efficient use.

Singapore prices water to reflect its value as a scarce resource, in addition to recovering costs from operating and investing in the water system. Merely pricing for cost recovery would not take into account the higher costs from expanding water supply through Newater and desalination, which are more expensive sources than water catchment and imported water.

Hence, the price of water is pegged to the long-run marginal cost of producing and supplying the next drop of water, as well as collecting and treating it after its use. Setting prices equal to the marginal cost of production is necessary for economic efficiency, while basing them on long-run rather than short-run marginal costs reduces pricing volatility and recognises the cost of investment to expand water production capacity.

The total price that PUB charges households and industries for water has three components. The water tariff covers the costs of producing and conveying potable water, while the waterborne tax recovers the costs of treating used water and maintaining its network. The third component, the water conservation tax, is charged as a percentage of the water tariff and serves to underscore the importance of conserving water.

Besides ensuring allocative efficiency and sustainable financing of the water system, this pricing formula incentivises water conservation by households and businesses, in particular heavy users of water.

Targeted assistance in the form of U-Save rebates is given to eligible HDB households to offset their utilities bills, with those in smaller flats receiving greater support. This approach of right-pricing water with targeted subsidies is more equitable than providing implicit price subsidies, which typically benefit large companies most.

REGULATION, GRANTS AND NUDGES

Besides pricing, regulations and standards play an important role in driving water conservation and efficient use. For instance, PUB sets maximum allowable flow rates for taps and mixers, and maximum flushing capacities for flushing cisterns and urinal flush valves. It also requires water fittings and appliances such as washing machines and dishwashers to have water efficiency labels. Since April 2019, only water fittings with a minimum water efficiency rating of two ticks are permitted for installation in new premises and those undergoing renovation. There are also plans to mandate water recycling for water-intensive industries from 2024.

The Water Efficient Building Certification programme encourages companies and building owners to adopt water-efficient fittings in their premises. PUB also provides industry benchmark and shares best practices through sectoral guides, to help companies identify opportunities to improve water efficiency.

Water efficiency standards should be continually reviewed and updated, just as energy standards for buildings are periodically updated to keep pace with our growing aspirations for a clean and green Singapore.

Government support can spur companies to do more. In 2007, the Water Efficiency Fund was launched to encourage innovation in water demand management. The fund supports activities such as water efficiency assessment, water recycling projects and adoption of water-efficient equipment. Funding support has been raised from July 2023 to better support businesses and industries in their water conservation efforts.

Public education and behavioural nudges are also important in shaping consumption habits. For instance, public utility bills show national and neighbourhood average water consumption to encourage households to trim water use.

PUB is deploying smart water meters across residential, commercial and industrial premises. Along with the roll-out, PUB will introduce a Customer Portal to provide near real-time data to customers to track their daily water usage.

These efforts have borne fruit.

Singapore's water consumption per head declined from 165 litres per day in 2000 to 141 litres per day in 2019, although it has risen to 149 litres per day in 2022, with more people working from home since the onset of the Covid-19 pandemic.

We will need new and innovative ways to strengthen the policy toolkit if Singapore is to achieve the water consumption target of 130 litres per person per day by 2030.

FORWARD PLANNING, INNOVATION AND PARTNERSHIPS

Along with demand management, there must be adequate investment in water capacity ahead of the anticipated increase in demand. Looking ahead, the lion's share of Singapore's water demand is expected to be met through water reclamation and desalination, especially since these sources are not dependent on rainfall.

However, these sources of water are also more expensive than water catchment and imported water. Effort must therefore be made to lower the cost through research, innovation and private sector partnerships.

There is already a well-developed water industry ecosystem here comprising more than 300 water companies and 17 research centres spanning the entire value chain.

As a "Global HydroHub", Singapore brings together government agencies, private companies and research institutes to promote research and development, grow the water industry and position Singapore as a global leader in water solutions.

In addition to supporting sustainability, resilience and service delivery, technology can help to lower the cost of water treatment and reclamation. For instance, PUB has been trialling the use of different types of membranes to improve the efficiency of the desalination process.

At the end of the day, long-term water costs and affordability should be among the outcomes prioritised under Singapore's water research agenda.

Partnerships with the private sector can also support innovation and cost savings by introducing market discipline. There are already three Newater and three seawater desalination plants that have been developed and run under public-private partnership (PPP) contracts. Under these arrangements, the private sector partners have a strong incentive to optimise plant design, operations and maintenance so as to lower costs.

Singapore has come far in our water journey, and we must remain focused on safeguarding water security in the years ahead. This requires the right-pricing of water as well as collective efforts by the Government, businesses and households to spur water conservation, while leveraging technology and innovation to improve water standards, services and affordability.

While doing so, we pave the way for a sustainable water legacy for generations to come.

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