

Decoding the Singapore Water Story

By Sahana Singh

A new book chronicling Singapore's journey towards self-sufficiency in water was launched at the Lee Kuan Yew School of Public Policy earlier this year.

The Singapore Water Story – Sustainable Development in an Urban City-State traces the journey of Singapore from the British era to modern times in the context of water management. Authored by Cecilia Tortajada, Asit Biswas and Yugal Joshi, it is a compelling story of a tiny island with no resources but plenty of resourcefulness.

Dr Tortajada is President, Third World Centre for Water Management, Mexico, which was founded by Dr Biswas. Yugal Joshi works with Northern Railways, Delhi and was formerly a researcher at the Lee Kuan Yew School of Public Policy (LKYSPP). Dr Biswas is Distinguished Visiting Professor at LKYSPP.

No one is perhaps more suited to write the Singapore water story than Dr Tortajada and Dr Biswas. For many years, the two water policy experts have been keenly following the city-state's progress in water management and have played an important role in validating its success.

While Singapore was moving towards its goals of becoming a developed economy and one of the world's cleanest cities, its leaders knew that water would play an important part in it. Dependence on Malaysia for over half of its water needs put Singapore in a vulnerable position amidst the acrimonious disputes between the countries which had separated in 1965.

The book highlights how water has always been viewed as a strategic resource in Singapore and how "water security has been a permanent consideration for the city-state's leadership". That Singapore was no different from the third-world countries surrounding it, with its polluted waterways, overcrowded river banks, and poor sanitation until the 1960s is perhaps known to many. But what the book attempts to uncover is the process by which this was reversed so very thoroughly.

The limitation in availability of land to store the bounteous rainfall was obvious. Groundwater was also not significant. Thus, in the 1972 Water Master Plan, Singapore outlined a strategy to proceed with surface water schemes as fast as possible to increase supply to a growing population. But what the book interestingly reveals is that so far back in 1972, the master plan already envisaged unconventional water sources such as desalination, water reclamation and putting barrages across the estuarine rivers to supplement surface water sources. It even visualised an increase in catchment area from 11% to 75% of the island and to implement pollution control measures so that this increase could be sustained.

With such a clear, far-reaching master plan in place, Singapore's fathers set out to make the necessary legislations, create appropriate institutions and ensure good coordination between all the ministries and agencies

working on water issues. The Clean Air Act and Water Pollution Control and Drainage Act were passed. Institutions such as Public Utilities Board, Anti-Pollution Unit, Economic Development Board, Jurong Town Council and Ministry of the Environment (now Ministry of the Environment and Water Resources) worked in tandem to attract foreign investors and build infrastructure while integrating environmental considerations.

"Regarding water pollution control, Singapore is very different from many other countries in at least three main respects," says the book. "First, trade effluent discharge standards adhere to strict norms that do not allow water-courses to remain 'moderately polluted' as many other countries do. Second, the city-state has kept its laws relevant to the changing needs by regularly amending them and enacting new ones. Third, it has maintained the strict enforcement of its laws, using vigilant monitoring as an important tool."

The evolution of Singapore's water tariffs also makes an interesting story. The authors point out that in the 1960s and 1970s, "steady increases in water demand were considered to be a good indicator of economic growth and national development". Higher consumption of electricity and gas were also regarded as positive signs of progress. However, the thinking about water changed after a serious drought in 1971. More investment had to be made to develop storage, treatment and distribution capacities, and this set the stage to introduce an increasing block tariff system. At that time, tariffs were not considered to be a tool to reduce water demand, but a means to recover costs.

In the 1980s when Singapore began building what was considered to be its last reservoir, the next source of water was projected to come from desalination, a ten-fold costlier option. "It was then that the need for water conservation struck a chord with leaders, planners and professionals," say the authors. A water conservation plan was introduced in 1981 and PUB began to stress on the importance of water conservation. Subsequently, the water conservation tax was introduced in 1991.

According to the authors, the most significant step in Singapore's water pricing policy took place in 1997 when the price of each cubic metre was pegged to the cost of desalinated water. This reflected the higher cost of harnessing alternative sources. "With this Singapore became one of the pioneering countries introducing marginal cost pricing," says the book. At the same time, the lowest two consumption tiers (0-20m³ and 20-40m³) were merged into one and this pricing applied to both non-domestic and domestic sectors. Above a consumption of 40m³, the domestic water tariff was higher while the non-domestic tariff remained the same.

A noteworthy feature of Singapore's water pricing is the manner in which rebates are offered to lower-income households. Instead of offsetting bills with subsidies, the rebates are deposited in the qualifying households' utilities account, and can be used to pay utility bills including water. "The government chose to decouple assistance from consumption, so that it would not lead to over-consumption of water," say the authors.

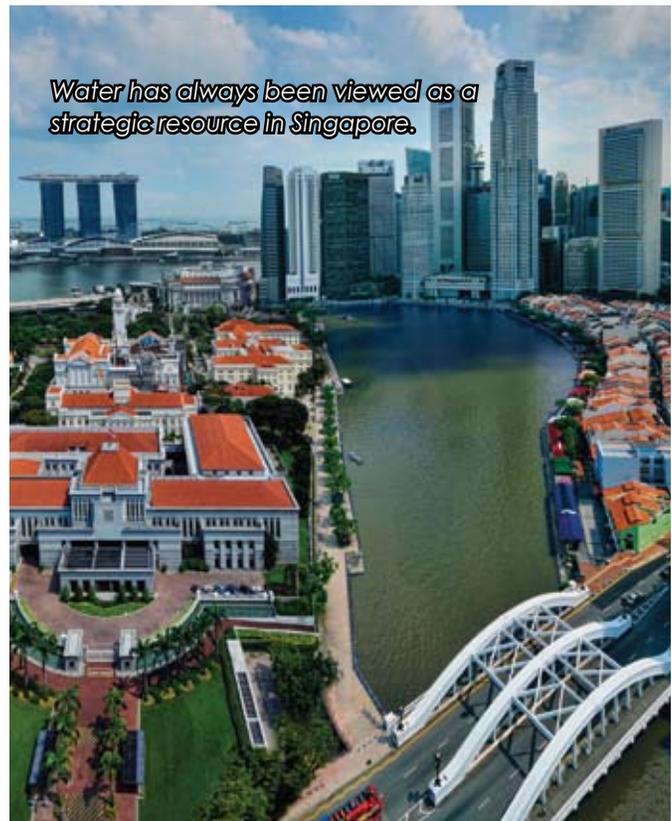
The book also elucidates how Singapore achieved the clean-up of its main river as well as Kallang basin. The Housing and Development Act was passed to build low-cost housing to improve the lives of the people. Slums cluttered along the waterways were cleared. Modern high-rise buildings appeared. Drainage and water engineers were asked to work together to solve the environmental problems associated with the waterways such as sewage flows. Hawkers were moved to facilities with water and sanitation while pig and duck farms were totally shut down.

"Singapore, from the beginning denied pollution as an inevitable offshoot of economic development," say the authors. They also acknowledge the role of the first Prime Minister of Singapore. "Lee Kuan Yew became the only Prime Minister anywhere in the world in recent history taking special and continuing interest in water throughout the entire 31 years he was in service," they say.

An entire chapter is devoted to the education and information strategies employed by Singapore for water conservation. It describes how various campaigns to save water were combined with innovative methods to engage with people such as a 'Meter Reading Contest'. It explains how members of parliament, schools, media and PUB staff were repeatedly mobilised to spread specific messages about water and how new monikers such as "used water" and "water reclamation plant" were coined to reinforce positive messages about recycling water.

While Singapore undoubtedly deserves most of the credit given to it for water management by the authors, perhaps the analysis could have been a little more critical about its environmental sustainability. Closing pig farms or any polluting industry cannot be counted as a sustainable step when citizens continue to get their supplies of meat and other products from overseas, often from where pollution standards are not enforced. The culture of consumerism in which Singapore is steeped like the rest of the world can only pay lip-service to the concept of sustainability. The city's per capita municipal waste generation is said to be in the region of 2.5 kg per capita per day, similar to the levels in other developed countries. Even if the recycling rate of waste is a high 58%, it does not offset the consumption of resources or carbon footprint of the plethora of products consumed.

Also, the book could perhaps have highlighted the trade-off with energy that Singapore made to achieve self-sufficiency in water. In fact, at the launch of the publication, the Minister of the Environment and Water Resources pointed out that the city-state had translated



Water has always been viewed as a strategic resource in Singapore.

a dependence on water into a dependence on energy. "Reverse osmosis requires energy. In other words, as long as you have got energy, you have got water. But that simply substitutes one strategic vulnerability for another. So, the key challenge for us in the future will be how we manage energy –the production of energy, the cost of energy, and the security of energy. In fact, the paradox or irony here is that the same principles for the water story will also have to be applied for the energy story. Get the politics right, get the economics right, and always be prepared to support and use, in a sensible and rational way, the latest and best available technology."

There is no denying that *The Singapore Water Story* fills a significant need by focusing on the journey which transformed a dirty, water-poor trading port into a water-adequate, world-class city. It is a story about making citizens appreciate the value of a resource which is usually taken for granted. While there is no dearth of publicity material on the achievements of Singapore in the water sector, not much has been disseminated about the road map used by its planners or the evolution of their strategies. Many cities that wish to emulate Singapore's success only look at the shiny technologies but fail to look at the bedrock of strategy, policy and political will that underpins it. Perhaps this book will nudge the wannabe Singapores to look deeper. **AW**

Please visit www.routledge.com to order a copy of *The Singapore Water Story – Sustainable Development in an Urban City-State*.