

PUB and Urban Water Management:

# *a Retrospective Assessment*

By Asit K. Biswas and Cecilia Tortajada

This year is the 50th anniversary of Singapore's independence. One major issue that has received inadequate attention is how Singapore improved its water management from a below average Asian developing city in 1965, to one of the best in the world within about two decades.

Singapore history of urban water management is not long. In 1857, philanthropist Tan Kim Seng donated S\$13,000 for constructing an initial waterworks and piped water system. The first reservoir was constructed in 1868 and was later expanded in 1891. The expansion was overseen by the city's municipal engineers, James MacRitchie. It now bears his name.

In 1965, the architect of modern Singapore, Lee Kuan Yew, took a special interest in water. Lee realized water was a strategic and existential issue for Singapore and thus must receive high national priority. This decision was based on two facts.

In 1942, the British blew a 70-ft gap in the causeway to slow Japanese advance. This meant the pipe that brought water from Johore was ruptured. Singapore then had only three reservoirs, with two weeks' water supply. The Japanese crossed Johore Straits in collapsible boats to take over Singapore. Singapore's water vulnerability made a profound impression on young Lee.

The second event was in 1965. The then British High Commissioner, Anthony Head, informed Lee that the Malaysian Prime Minister had told him: "if Singapore's foreign policy was prejudicial to Malaysia's interests they could always bring pressure to bear on them by threatening to turn off the water in Johor."

These two events shaped Lee's view of strategic importance of water. Following the Malaysian threat, he asked for an estimate of how much rain fell in Singapore and how much could be used. He established a unit in his office which assessed all government policies

through the lens of water. As he told us "every policy had to bend to the knees of our water survival."

Prime Minister Lee's personal and continuing lifelong interest on water ensured Singapore's urban water management became the envy of the world. National leaders everywhere are interested in water only when there is a drought, flood or natural hazard. The moment the crisis disappears, water vanishes from political agenda. Lee is the only leader who was consistently interested in water throughout his entire political career. This has not been replicated in history.

Singapore's progress has been remarkable. Consider floods. In December 1969, floods resulted in five deaths and damages of \$4.3 million (1969 prices). Nearly 6,900ha, or 12.8% of the country was flood-prone. Singapore has not had a single fatality due to floods over the past three decades. Flood-prone area has been reduced to 34 hectares. An average flood currently lasts less than 30 minutes.

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The last night-soil removal service was phased out on January 24, 1987. It now has an outstanding wastewater collection, treatment, recycling and reuse system to produce ultra-clean reclaimed water (NEWater) that has become one of four sources of water supply.

Another example is the cleaning of Singapore River and Kallang Basin. In 1977, as part of the re-development efforts of the city, Lee set a target of 10 years for their cleaning. True to Singapore style, following the political decision, this was completed within time, requiring resettlement of more than 45,000 squatters who were discharging liquid and solid wastes, and phasing out 610 pig farms and 500 ducks farms. People were resettled in new housing estates with tap water and sanitation and a superior quality of life.

An analysis of the benefits of the clean-up shows significant economic, health, social and environmental benefits, confirming the wisdom and foresight of political leaders. This extraordinary

performance was made possible by consistent strong political support from highest levels of government and long-term visionary planning.

This remarkable success story was possible because of excellent future-oriented plans and their timely execution by PUB, Singapore's national water agency. It was consistently underpinned by responsible and proactive political and administrative leaderships, relentless pursuit of economic growth that has contributed to steady improvements in living standards and perpetual quest for excellence. The net result has been a true success story of self-resilience, creation of consistent growth opportunities and good governance. This is in spite of scarcity of natural resources, including water, which could have easily torpedoed such a fairy story.

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