

Water demand management strategy Singapore

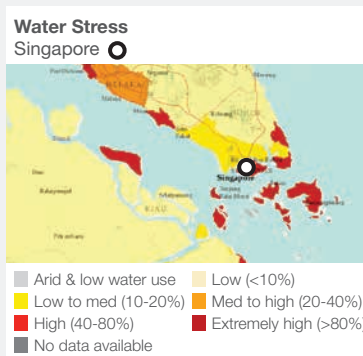
water scarcity impact

Reduced withdrawal	●
Reduced consumption	●
Improved water quality	●
Increased productivity	●
Net basin benefit	●

volumetric impact
1 818 000m³/yr

capital cost
confidential

estimated unit cost of water
not available



Water Stress Map:
Gassert, F., M. Landis, M. Luck, P. Reig, and T. Shiao. 2013. "Aquaduct Global Maps 2.0."

Confidence level
● Low ● Medium ● High

Water Scarcity Impact Key
● Main ● Minor

Credits
 We wish to acknowledge the input and support of Diana Cheong of the Public Utilities Board in the preparation of this case study.

Project Overview

The Public Utilities Board (PUB), Singapore's national water agency, has recognised that projected population growth will lead to increased future water demand. The 'Four National Taps' Strategy developed by PUB aims to diversify the sources of water available. The 'four taps' are; increasing local catchment area from 50% to 67% of Singapore's land area; importing water from Johor; NEWater – which is high quality reclaimed water; and a desalination plant at Tuas.

But securing an adequate supply is only half of the challenge for Singapore; managing demand is of equal importance. Key to managing demand has been facilitating behaviour change in water use and consumption. The campaign to manage demand is known as the 3P approach and encourages everyone (People, Public, Private) to take ownership of water resource management. This concept is embodied in PUB's tagline - Water for All: Conserve, Value, Enjoy. Central to this new approach is the Active, Beautiful, Clean Waters (ABC Waters) Programme which is enhancing Singapore's water infrastructure bringing people closer to water, so they better appreciate, cherish and ultimately value water. Water conservation programmes have encouraged industries and households to use water wisely, and save 10% of their water use, and 10 litres of water a day respectively. Per capita water use has fallen from 165 litres/day in 2003 to 155 litres/day in 2013 and the aim is to achieve 147 litres/day by 2020.

Key Elements

- Community engagement through; Water Efficient Homes (WEH) and development of ownership through the Active Beautiful Clean (ABC) waters programme.
- Pricing restructure, upgrading the metering system and legislative measures.
- Water Efficiency Fund to encourage companies to manage demand.

Key Outcomes

- The WEH programme reached 68 out of 84 constituencies by 2005.
- Reduction in per capita use from 165 litres/day in 2003 to 152 litres/day in 2013.



Singapore

Intervention Features

- Revision of building regulations
- Water metering in municipalities
- Water tariff management
- Stakeholder engagement

Project Levers

(1) Public Engagement:

The PUB launched the WEH programme to alter behaviours at the domestic level. Do-It-Yourself (DIY) water saving kits were distributed to grassroots organisations and then passed onto residents free of charge. The kits consisted of faucet flow regulators, cistern water saving bags, leaflets and conservation tips. In conjunction with the Singapore Environmental Council (SEC), PUB set up a website for water conservation. Users were challenged to assess their individual usage and identify areas for improvement.

Through the Active Beautiful Clean (ABC) waters programme, Singaporeans were encouraged to take ownership of their surrounding water bodies. Adoption by schools and community groups who took an active part in their management, encouraged this. This has benefits for both water quality and conservation as it engages the public in understanding the value of water. The PUB also established a 24-hour leak hotline; 99% of urgent complaints are attended to within 45 minutes. Customers are able to contact the PUB through telephone, fax, emails, SMS and web chat.

(2) Pricing and Metering:

The entire water supply system from the water treatment works to the customers' premises is 100% metered.

The tariffs and Water Conservation Tax were restructured over a four-year period to reflect the scarcity value of water. The tariff and water conservation tax increased from 30% to 45% for domestic users after the first 40m³ a month. The metering system has been upgraded and now uses a computerised billing system.

Through Information and Communication Technology (ICT) monitoring, any readings that are abnormally high or low are singled out for further investigation. These measures contribute directly to a reduction in per capita use.

In addition PUB introduced a business Water Efficiency Fund in July 2007 with the aim of encouraging companies to look into efficient ways of managing their water consumption through conservation projects.

(3) Legislation/Building Codes:

Legislative measures have been implemented to deter wastage. From 2009 it has been mandatory to install dual flush toilets and low flow taps; this included renovations and new builds. To aid compliance the PUB conducts spot checks on residential buildings to ensure that the mandatory requirements are being followed.

Outcomes and Challenges

The integrated use of public engagement, legislation and pricing has had a significant impact on per capita use which had been rising before the programme. This has played a significant role in ensuring future water security for Singapore.

Other outcomes include:

- Through the WEH programme, one in three households installed the water saving devices, reducing their monthly utility bills by 5% due to increased efficiency.
- Through the ABC programme over 20 catchments and water source sites have been adopted by local communities. The number is expected to increase to 100 by 2017.
- Per capita consumption has fallen from 165 litres/day in 2003 to 152 litres/day in 2013 and is projected to be 147 litres/day in 2020.



Above: The Singapore Marina Barrage creates a freshwater reservoir keeping out seawater (© ngotoh - Flickr)