Singapore’s Active, Beautiful, Clean Waters Programme

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WATER IN SINGAPORE
Geographical context of Singapore

Singapore
Land Area 716 km²
Population 5.4 mil
Average Annual Rainfall 2,400 mm
Average Water Demand 1.8 mil m³/day (approx 760 Olympic size swimming pools per day)

Ensuring Water for All in Singapore

Four National Taps

Imported Water
Desalinated Water
NEWater
Local Catchment Water
Two-thirds of Singapore’s land area is now water catchment
- Separate stormwater and sewerage systems
- Rivers have been dammed up to form reservoirs

Legend
Elevation
Areas below RL 102m (Total: 24sq km)

| Annual frequency of occurrence of maximum hourly rainfall exceeding 70mm (upward trend of 1.6 days per decade) |

Inherent geography
- Very intense rainstorms
- Tidal range of 3m
- Low-lying grounds

Climate change
- Historical rainfall data: a trend towards higher rainfall intensities and higher frequencies of intense rainfall

Urbanisation
- Highly-urbanised catchments
- Densely populated

Implications
- Drainage capacity must be large enough to cater for high peak flows
- Limited space available to widen drains due to competing land use
Holistic Stormwater Management

ABC Waters and climate change

- Flood Control
  - Prevention and Alleviation of floods
    - Drainage master planning and development control
    - Drainage improvement projects
    - Flood Control
  - Water Supply
    - Rainwater harvesting on a large scale

- ABC Waters Programme
  - Integration with the Built Environment
  - Enhanced waterways and reservoirs to bring people closer to water
  - Proactive implementation of ABC Waters design features in public and private developments
  - Help to slow down runoff
Before the ABC Waters programme

Waterbodies Design Panel
- End-1989 - 2000
- Focus: Aesthetic treatment of waterbodies and their environs and their possible recreational uses
- Demonstration projects, e.g. Sungei Api Api
- Development control submission guidelines
- Compilation of techniques for the aesthetic treatment of waterways
A paradigm shift in Singapore’s water governance

• Water bodies opened up for community and recreational use

• More engaging and experiential ways for the public learn about the importance of water

• Public as guardians of Singapore’s water resources

Active, Beautiful, Clean Waters programme

“...In the past, we protected our water resources by keeping people away from them; now, we will bring people closer to water so that they will enjoy and cherish it more... By linking up our water bodies and waterways, we will create new community spaces that are clean, pleasant, and bustling with life and activities. We will integrate our water bodies with our parks and green spaces and turn Singapore into a city of gardens and waters.”

Singapore Prime Minister Lee Hsien Loong at the launch of ABC Waters Master Plan in 2007
Water as an environmental asset

Blue map of Singapore
17 reservoirs, 32 major rivers and more than 8000km of canals and drains...

ABC Waters Management Strategy

Traditional stormwater management

ABC Waters management strategy
**ABC Waters programme**

Active, Beautiful, Clean Waters: Kallang River @ Bishan-Ang Mo Kio Park

Before *Image*

After

**ABC Waters programme**

Spaces to encourage community ownership of Singapore’s water resources

Alexandra Canal

Sengkang Floating Wetland

Sungei Ulu Pandan

Lower Seletar Reservoir
**ABC Waters design features**

- Cleansing biotope at Jurong Eco-Garden
- Wetland at Grove Drive
- Rain Garden at Balam Estate
- Vegetated swale at Sungei Ulu Pandan

**Promoting the adoption of ABC Waters**

**Building up capacity**

- ABC Waters Design Guidelines
- ABC Waters Professionals programme
- Training of third parties on maintenance of ABC Waters design features
- Incorporation into tertiary education curriculum

**Incentivising**

- ABC Waters Certification
Scaling up the ABC Waters Management Strategy

Punggol C39
(3.98 ha)
Kallang Riverside
(23.5 ha)
Bidadari Estate
(93 ha)

Continuous work on ABC Waters design features has offered Singapore a set of solutions that can:
- Help build up resilience to climate change
- Offer co-benefits such as social amenities and urban biodiversity

Looking to the future:
- How can we further scale up ABC Waters Management Strategy and have ABC Waters design features implemented in more spaces?

Conclusion
Thank you