

# **SINGAPORE'S INTEGRATED WATER RESOURCE MANAGEMENT (IWRM) PROGRAMME**

## **1. Description of Singapore's IWRM Programme**

The effective management of water resources has been and will always be a challenge for all developing as well as developed countries. In land scarce Singapore, the use of land for water catchment has to be delicately balanced with the requirements for socio-economic developments. As water remains a scarce resource, there is a need to ensure its long-term sustainability through efficient water resource management. Forward planning, careful management of water resources, and putting together adequate investment in infrastructure and effective technology are critical in ensuring the long-term sustainability of our water resources.

Having said that, Singapore faces 5 key challenges in water resource management, namely; protecting our water resources, processing safe drinking water in a cost-effective manner, minimizing wastage in water supply system, water conservation, and closing the water loop. Singapore has faced up to these five challenges through a comprehensive integrated water resource management programme; and has achieved 100% access to basic sanitation as well as safe drinking water for the population.

The success of the IWRM programme can be attributed to the efforts of all sectors of the population; from the political will and infrastructure provided by the government, the collective commitment of the community, to the technological expertise and innovation from the private sector.

## **2. Mainstreaming / Sustainability**

### Challenge 1: Protecting our water resources

We believe that urbanization and industrialization need not necessarily result in water pollution. Pollution must be tackled at source and if industries were made to adhere to stringent requirements, our waters will not be polluted. Having in place a very stringent water pollution control programme, Singapore is still able to turn half of its limited land area of 660 square kilometres into water catchments despite more than 30 years of urbanization and industrialization. This overall catchment area will eventually be enlarged to cover two thirds of the island.

### Challenge 2: Process safe drinking water in a cost effective manner

The second challenge lies in more efficient treatment of water. We realize that we may not be able to optimize the recovery of our waters through traditional sedimentation and purification methods. In this regard, Singapore has leveraged on rapid technological advances to develop new and sustainable sources of supply like NEWater (utilizing advanced membrane technology to aid in water reclamation) and desalinated water to help diversify Singapore's water resources. These two sources of water will enhance the sustainability of Singapore's water supply. By 2005, our water supply will come from four

national taps (main sources) - water from local water catchments, imported water from Malaysia, water from NEWater (reclaimed water), and water from the sea.

### Challenge 3: Minimize wastage in water supply system

In Singapore, through efficient management of the transmission and distribution system from source right through to the consumer, we ensure minimal loss of water. Singapore has achieved a low unaccounted-for-water by implementing leakage control, full and accurate metering policy, proper accounting of water used and strict legislation.

### Challenge 4: Water conservation – Putting every drop to good use

The fourth challenge pertains to water conservation, which means putting every drop of water to good use. Water conservation requires the collective commitment of the community and Singapore constantly undertakes educational initiatives to nurture a culture and environment where members of the public understand the need for efficient use of water.

Singapore has also recognized the importance of demand management and has put in place a comprehensive programme to help keep household water demand in check. This is managed through a community-driven programme called Water Efficient Homes. This programme helps every home to conserve water through use of water saving devices that can be easily fitted into taps. Despite having a very low percentage of unaccounted-for-water (5%), we are continuing with efforts to minimize this further as every drop accounted for will go towards minimizing water wastage.

### Challenge 5: Close the water loop

The fifth challenge is to close the water loop. Instead of discharging treated used water into the sea, we need to look into ways of harnessing the treated used water for further use. Through water reclamation, we can maximize the effective use of each drop of water. Singapore achieves this through our NEWater Initiative.

## **3. Replicating the Initiative**

With this holistic approach, we are able to close the water loop and keep water consumption in Singapore at 165 litres per capita to ensure that demand is managed well while increasing supply.

Every country has its own unique situation and circumstances. The approaches adopted by Singapore may or may not be relevant to other cities and countries. Water will remain a critical resource in the course of any country's socio-economic development, and there is a need to ensure its long-term sustainability through an integrated water resource management programme. In that regard, Singapore looks forward to exchanging information and experiences with international partners in the expertise in various aspects of water resource management efforts.