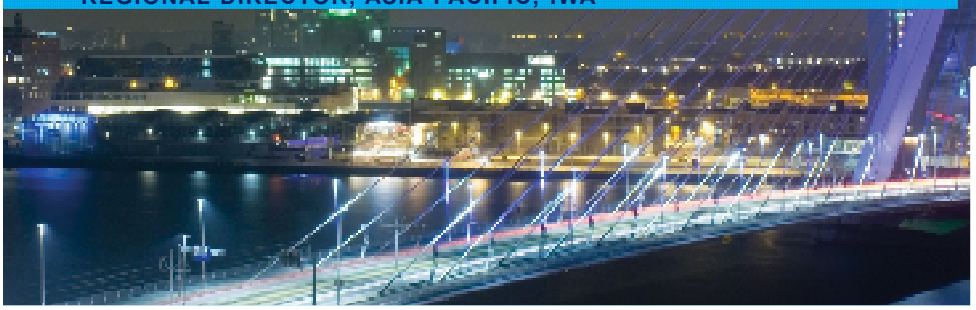
Resilient Water Management Strategies for a Climate Changing Society

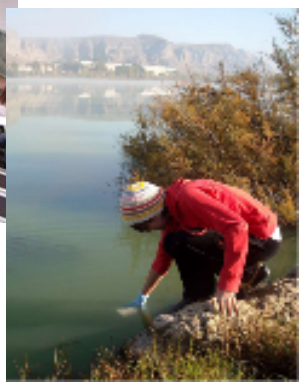
GANESH PANGARE
REGIONAL DIRECTOR, ASIA-PACIFIC, IWA



inspiring change

INTERNATIONAL WATER ASSOCIATION

Global network for water professionals spanning the continuum of research and practice, and covering all facets of the water cycle

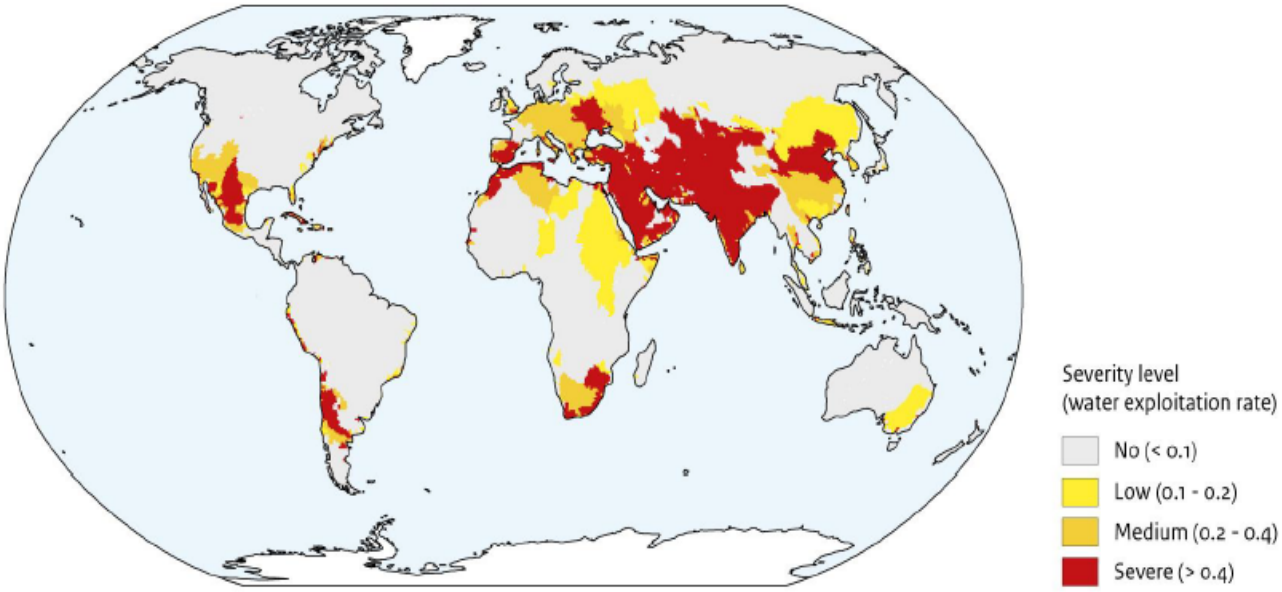


CLIMATE CHANGE IS A REALITY

An abandoned ship in the former Aral Sea, near Aral, Kazakhstan.

Unprecedented Challenges

3.9 Billion People in Severe Water Stress Basins



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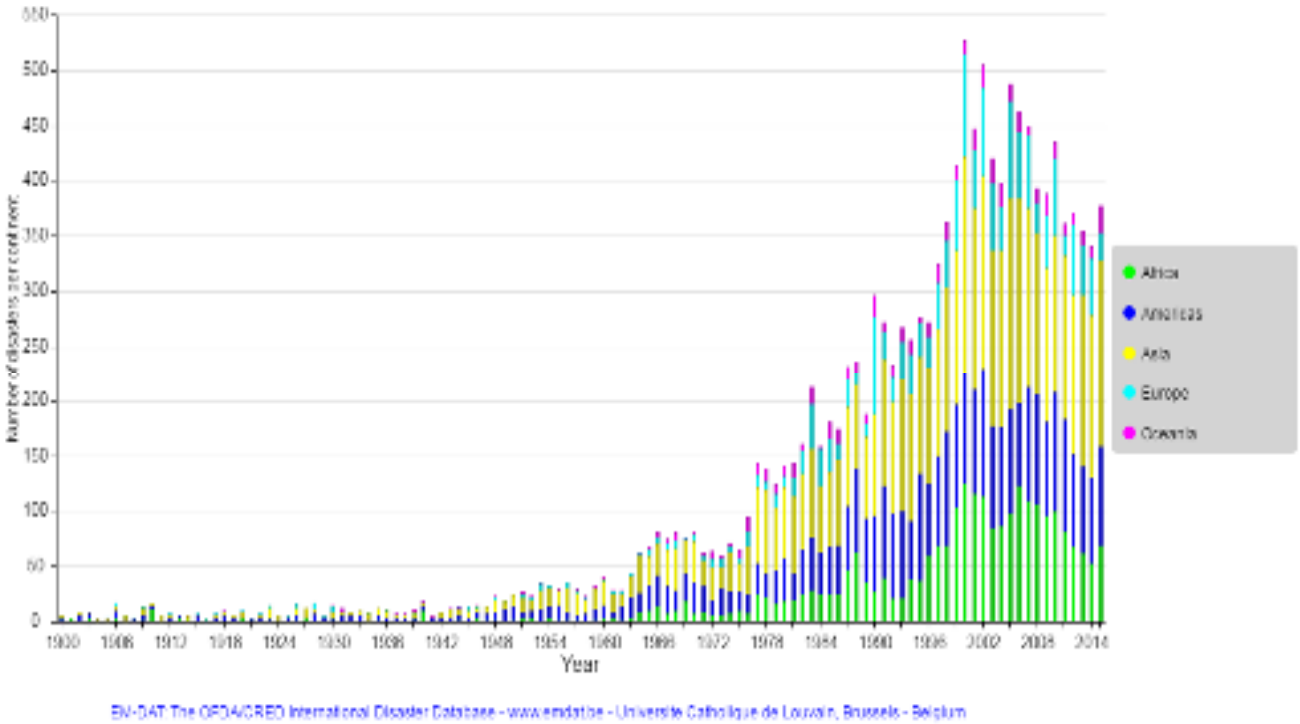
CLIMATE CHANGE IS A GROWING REALITY

NB OF DISASTERS BY CONTINENT

the international water association



EM-DAT The OFDA/CRED International Disaster Database - www.emdat.be - Université Catholique de Louvain, Brussels - Belgium

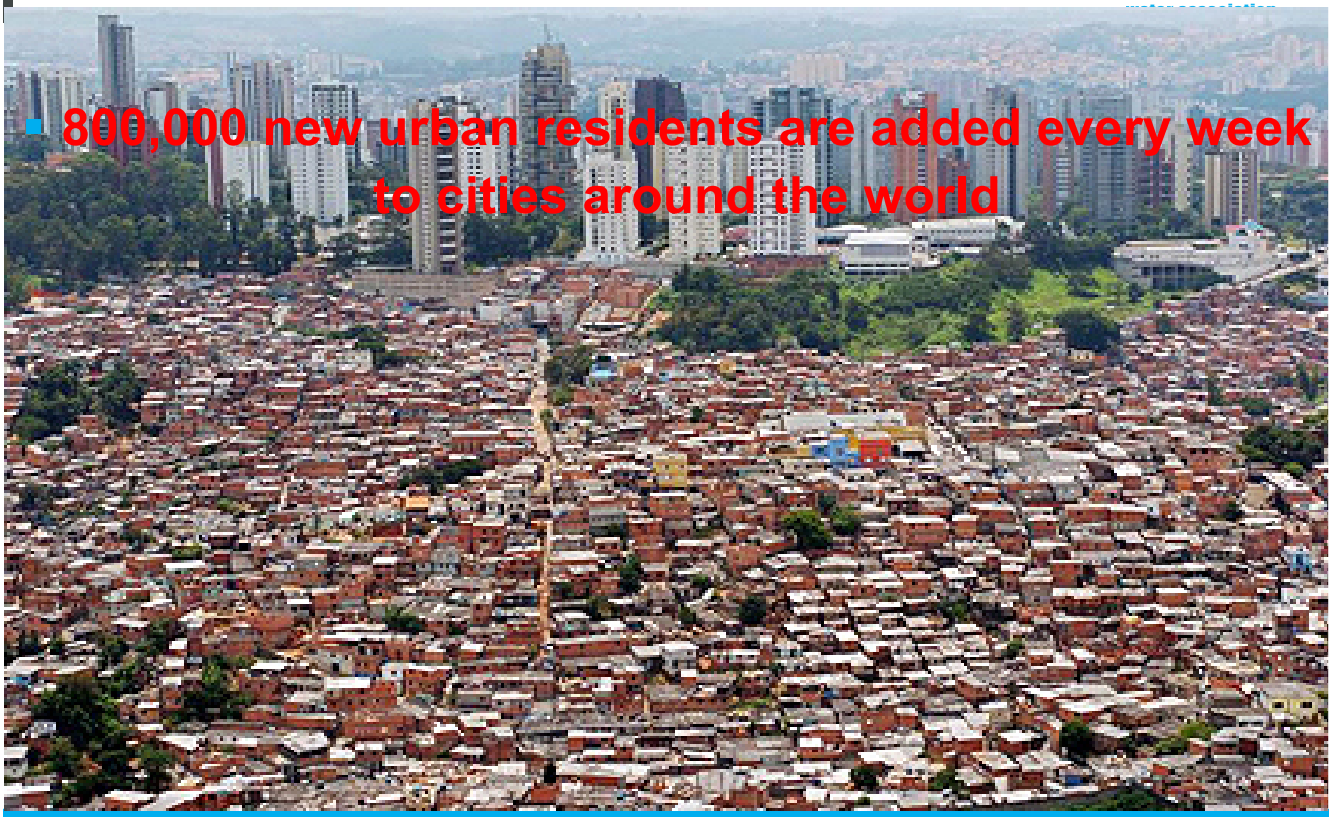
MEETING HIGH LEVEL TARGETS

… to adress Global Challenges by 2030

Climate	Access	Environment
2°C	100%	50%
Cap on Temperature rise	Safe drinking and adequate sanitation	Reduction in untreated wastewater

RESILIENCE OF UTILITIES TO NATURAL DISASTERS

PRINCIPLES FOR WATER WISE CITIES



- 800,000 new urban residents are added every week to cities around the world

The Plan of Taipei Water to Battle against Natural Hazards

Strategy – Five layers of protection

Invest $USD 1.4 billion from 2006 to 2025 to set up five protection layers.

Increasing efficiency of water resource.

Enhance water supply system

Drought

Storm rain

Accident

Earthquake

Level 1

Decrease leakage under 10%

Level 2

Implement household water Conservation

Decrease 16% of using water

Level 3

Increase efficiency of water purification

Back-up rate to 50%

Level 4

Build back-up system for 11 supply zones

Dual system for water supply

Level 5

Establish emergency water supply system and take aseismic measure

2. Establishing 46 Emergency Water Supporting Stations

Goal: Provide each citizen 3 liter of life-supporting water daily for 28 days

Reason: To have enough time to repair the damaged facilities if needed.

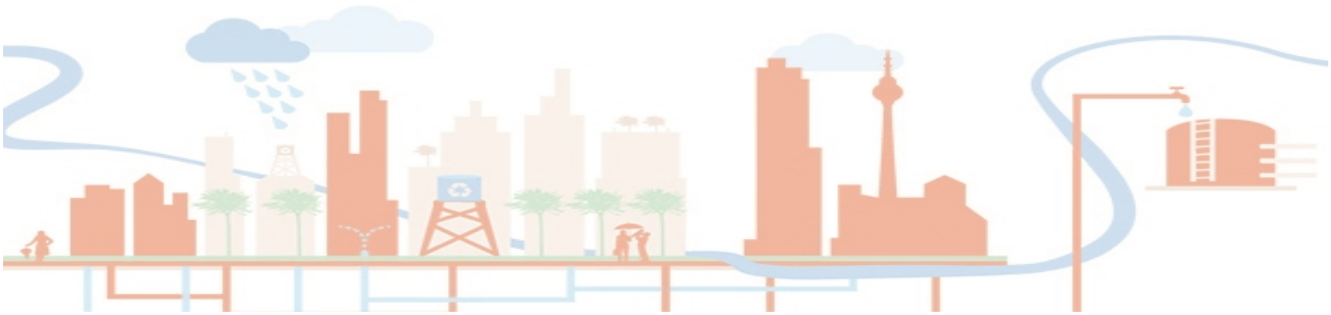
Budget: **US$ 4.94 million**

Period: **2007~ 2013**

Distribution of Water Supporting Stations

Water and Wastewater Companies for Climate Mitigation (WaCCliM)

Closing the carbon loop: utilities as key-players



How can greenhouse gases be reduced in water supply and wastewater treatment?

Mitigation = efforts to reduce or prevent emission of greenhouse gases (e.g. carbon dioxide, methane, nitrous oxide) into the atmosphere

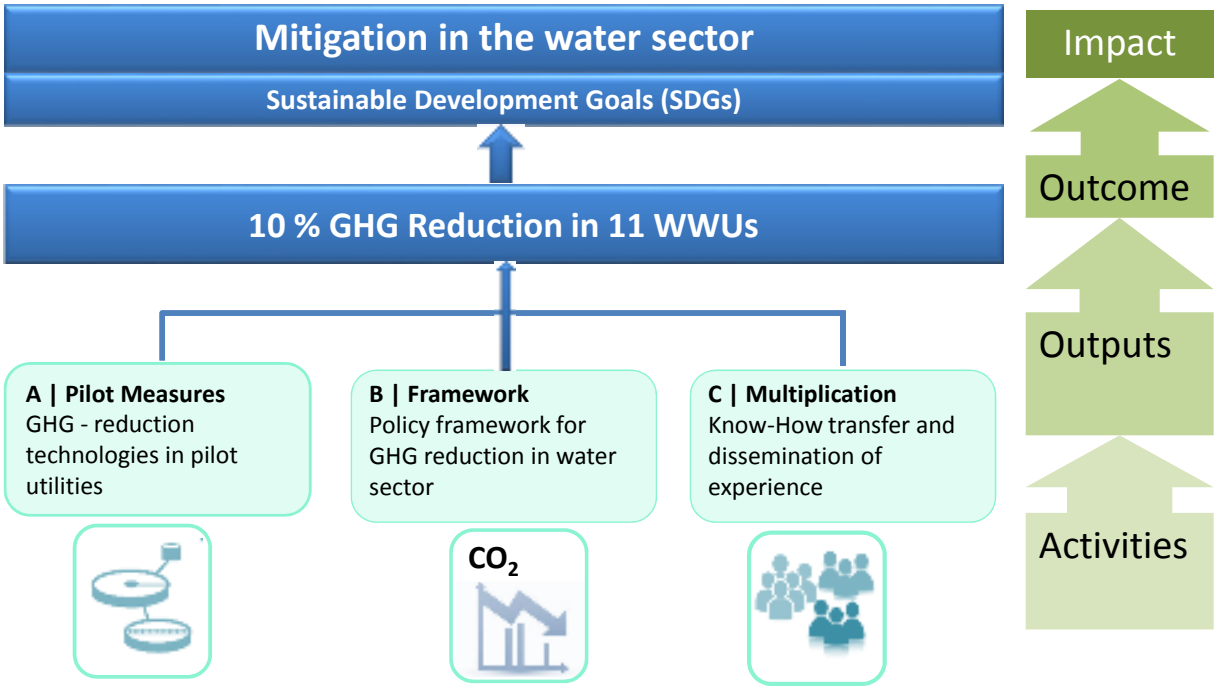
- Requiring less energy for the same service or product
  Reducing water losses, using energy efficient pumps
- Producing and using renewable energy
  Producing biogas from wastewater
- Reducing or preventing direct greenhouse gas emissions
  Reducing methane emissions from treatment tanks and sludge
- Substituting processes that would use energy elsewhere
  Recovering nutrients from wastewater instead of producing fertiliser

What is the water sector's benefit of reducing greenhouse gas emissions?

- Reduced operational costs of utilities
- Less dependency of the water sector on fluctuations of energy prices
- More efficient use of water resources
- Contribution to the country's climate mitigation goals

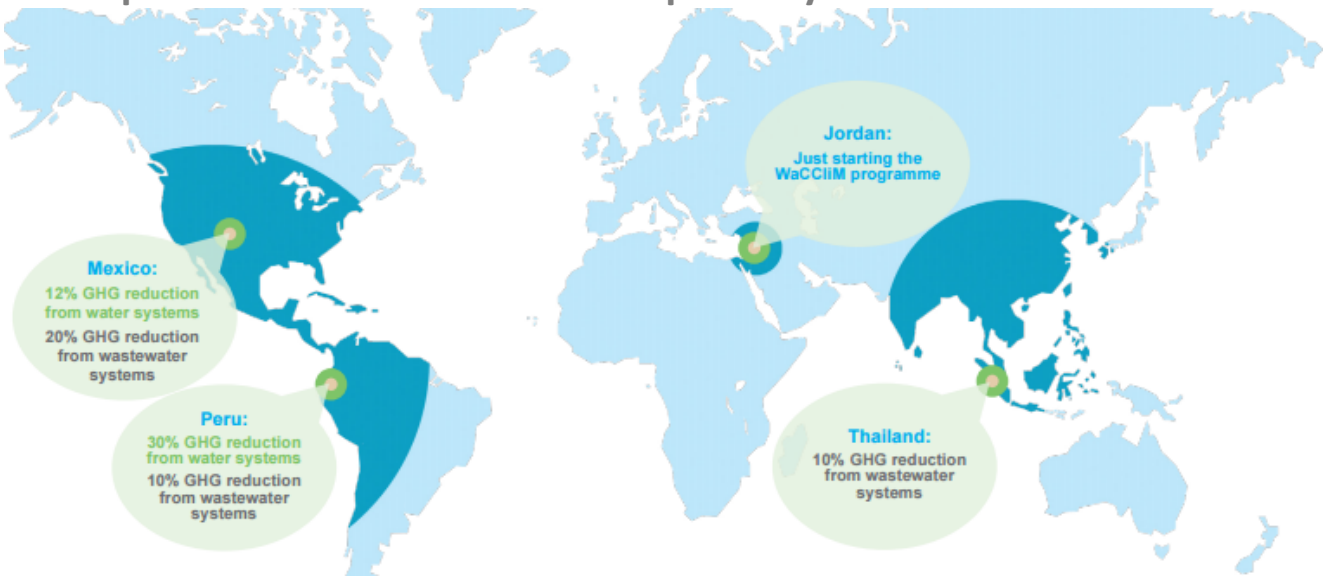
WACCLIM PROJECT APPROACH

Water and Wastewater Companies for Climate Mitigation (WaCCliM)



WACCLIM PILOT UTILITIES

Anticipated reductions at WaCCliM pilots by 2018:



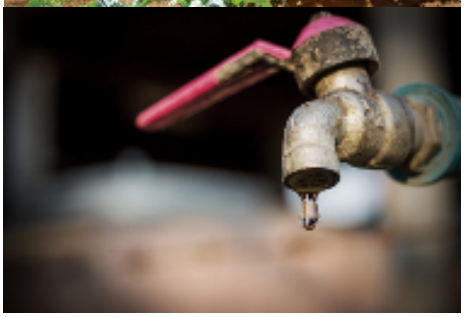
MEXICO	PERU	JORDAN	THAILAND
San Francisco del Rincón	***Cusco***	***Madaba***	***Chiang Mai***
Water Supply and Wastewater Treatment System	**Water Supply System and Wastewater Treatment System**	**Water Supply System and Wastewater Treatment System**	**Wastewater System**
128 000 pop.	415 000 pop.	190 000 pop.	150 000 pop.

Water and Wastewater Companies for Climate Mitigation (WaCCliM)

Tackling Water Scarcity – HOW?

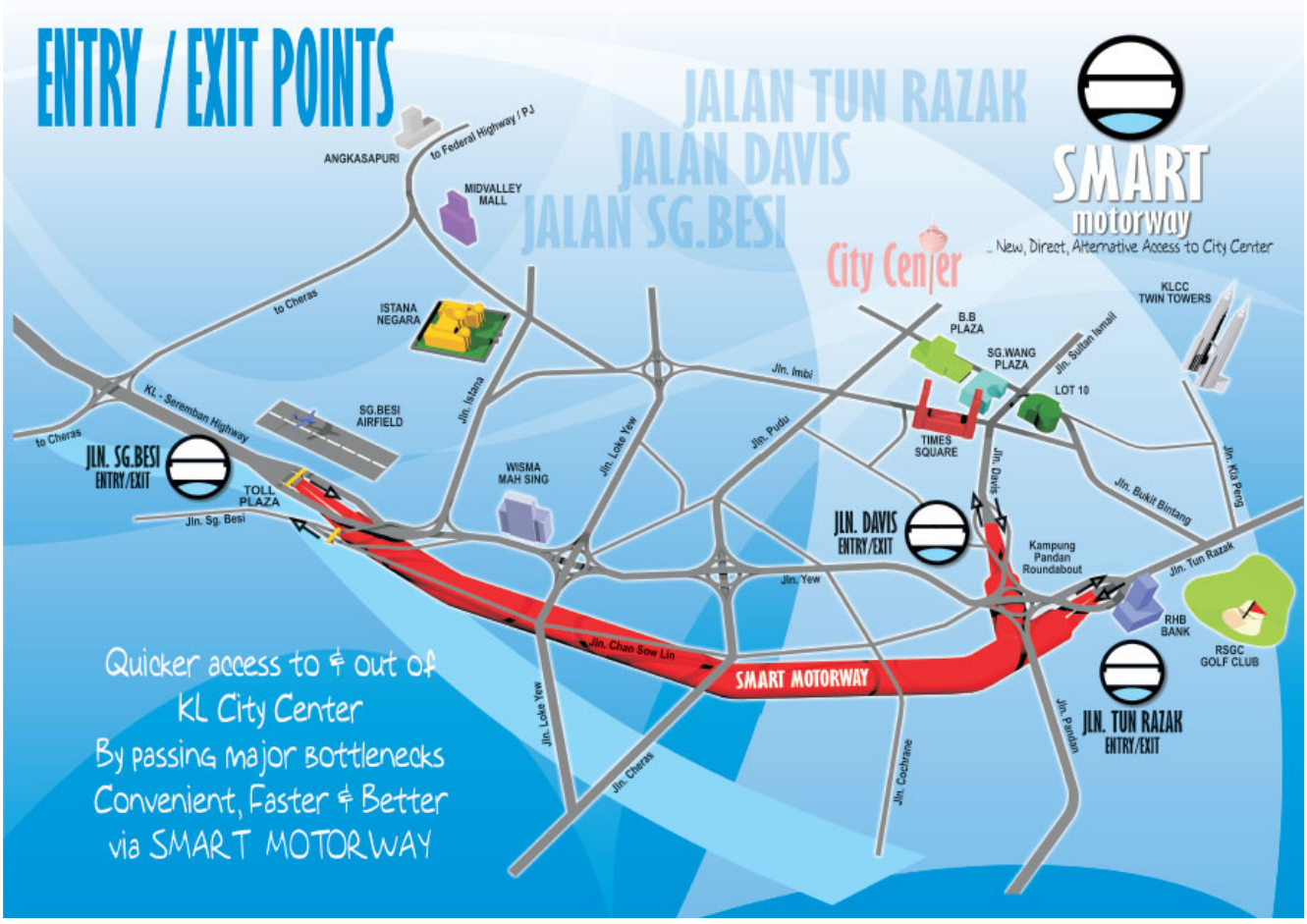
Principles

- Building resilient water systems – able to coping with long term scarcity and shorter extreme situations
- Pro-active management – beyond responding to extreme conditions and focus on long term preparedness

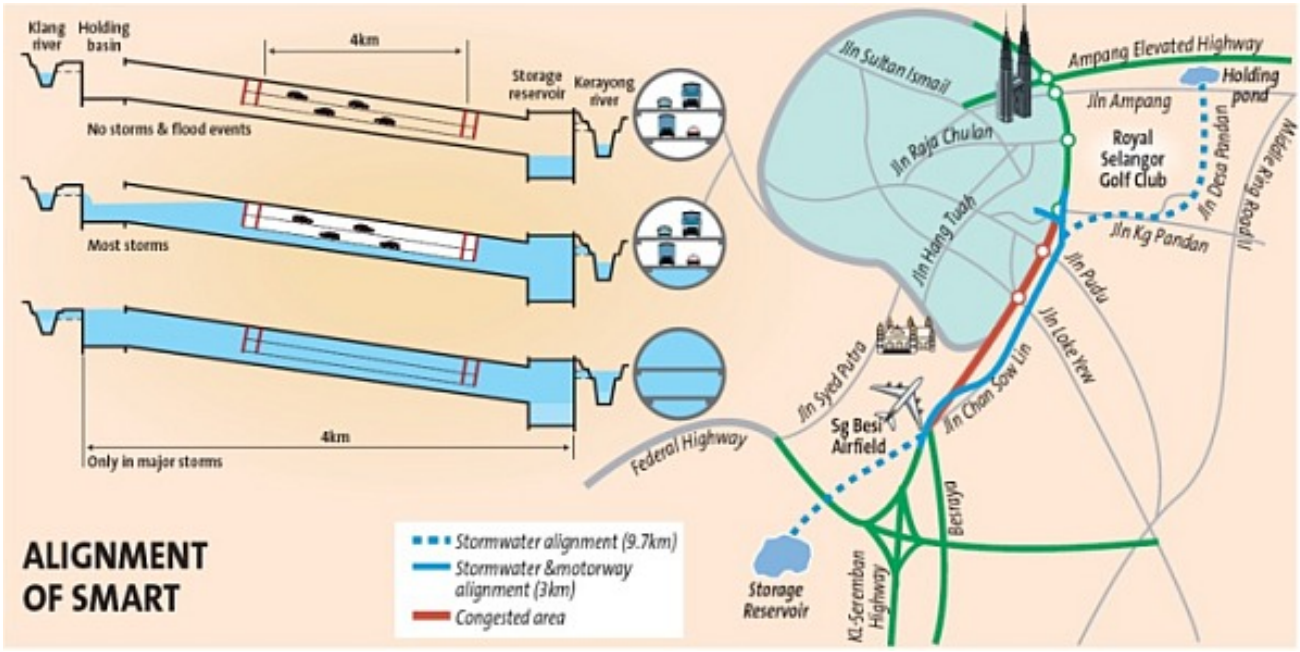


Focusing on, for example:

- Demand management while augmenting supply
- Efficient and effective water allocation amongst users
- Cascading water from one user to other
- Efficiency in use



SMART (Storm water Management And Road Tunnel), Kuala Lumpur (since May 2007)



Solving two problems the Smart way

By PRAKASH DANIEL
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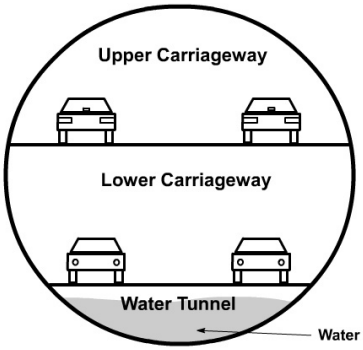
MALAYSIA has many highways and expressways. But imagine if one built underground could double up as a flood diversion channel during seasonal monsoon rains? Can a tunnel big enough in diameter and long enough be built to house such an engineering feat in Kuala Lumpur?

The answer is 'Yes'. What started out as a vision in 2003 became a reality when the Stormwater Management And Road Tunnel (Smart), an engineering marvel built by MMC-Gamuda Joint Venture was completed in 2007. Since then, the first-in-

venience of having Smart as a flood prevention solution and as an alternative route to the city centre. Now when the motorway is closed for maintenance works or during a flood operation, commuters feel the inconvenience but realise how Smart has once more helped keep Kuala Lumpur streets dry.

Smart, a project by two Government agencies namely the Department of Irrigation and Drainage and Works Ministry, was designed and built by local contractors with a local workforce who



Tsurumi river basin, Japan

A win-win situation creating multipurpose facilities and land use including flood retention.