

- OBSERVANCE OF THE “WORLD CITIES DAY 2018” -
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Urban Water Management & SDGs

Urban Water Augmentation

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Urban Water & SDGs

PARTNERSHIP



PROSPERITY



PEACE



PEOPLE



PLANET



Water Scarcity

- Historically integrated water resource management approach coordinates the water-use in the conventional sectors – agriculture (60% to 80%), industry (5% to 15%) and domestic (10% to 20%).
- With the rapid growth (agriculture, industrial and population) absolute demand for water is also increasing in all the sectors.
- To meet this growing demand with limited water resources, which are also getting depleted due to over harvesting and also due to contamination, the sectors have to formulate comprehensive policy as part of integrated water resource management.

Vision



Asia's Water Imperative Every Drop Counts!

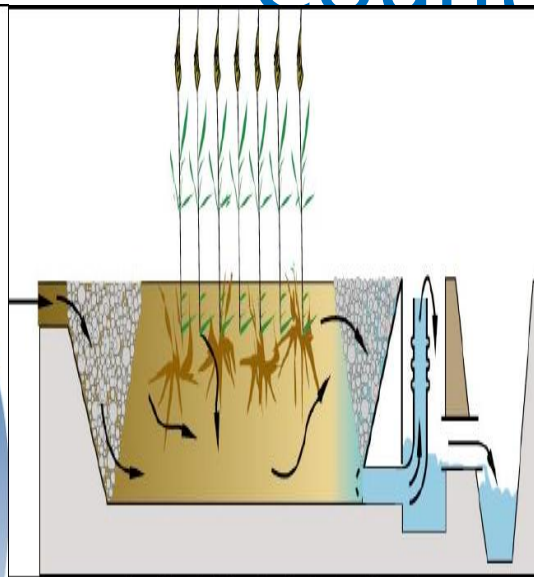
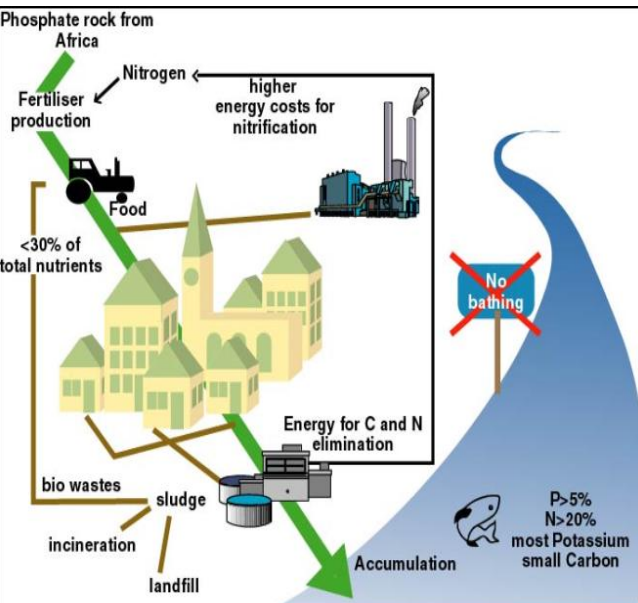
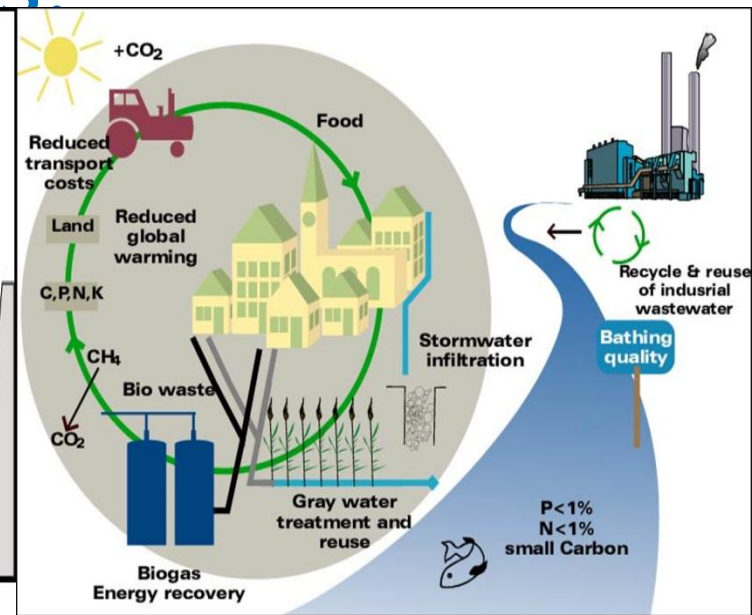
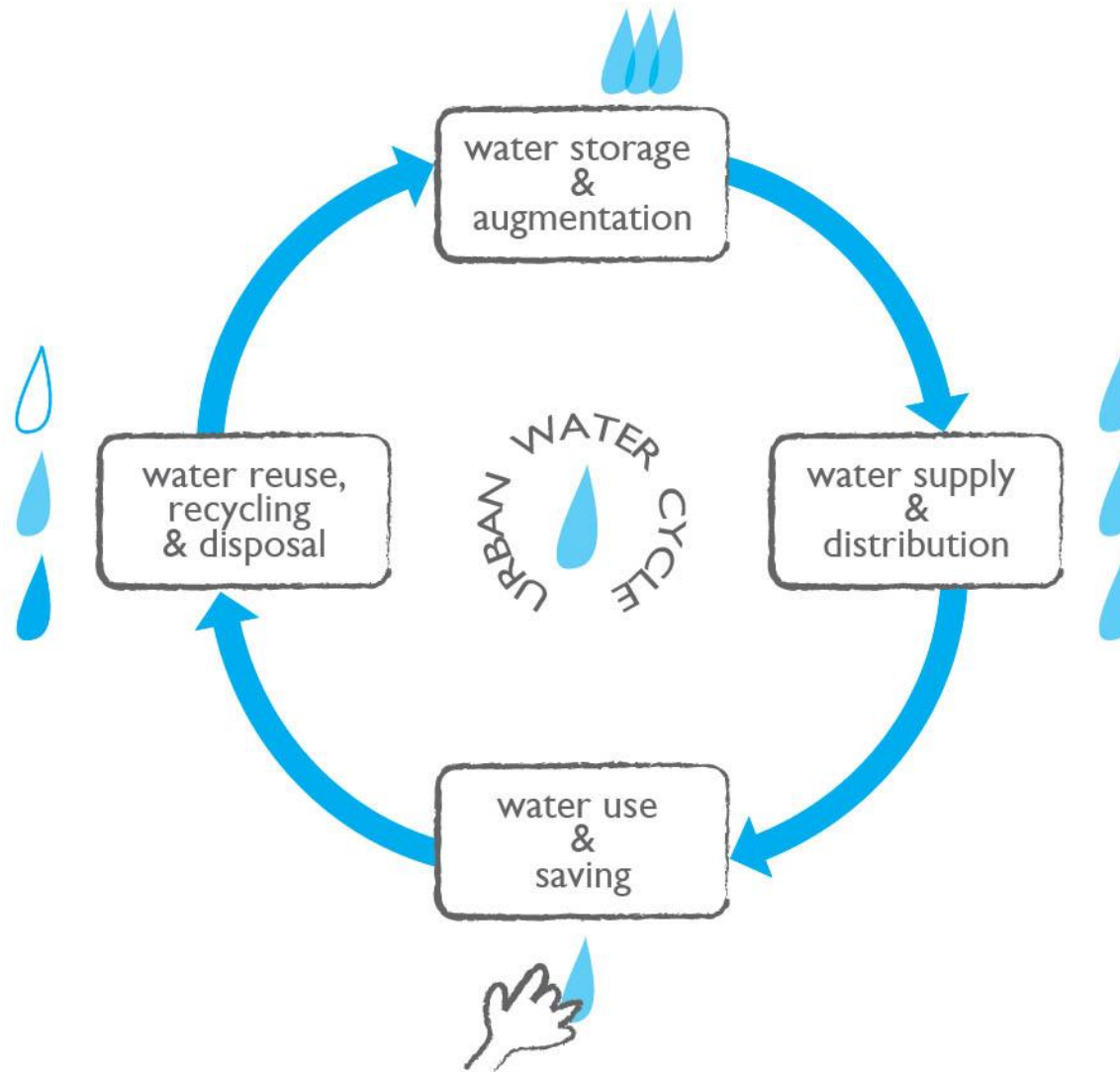


Figure 7 A typical Sub-surface Flow Constructed wetland



Urban Water Augmentation – Saving the losses



Designing and Realizing the Plan

Specific criteria for the local plan

PLANET

(ecological)

sustainable is:

- sound use and liveability

PEOPLE

(social)

- participation
- fair sharing
- gender

PROSPERITY

(economic)

- profit and development

FLOWS

- ⇒ which flows?
- choices made?

AREAS

- ⇒ which areas?
- choices made?

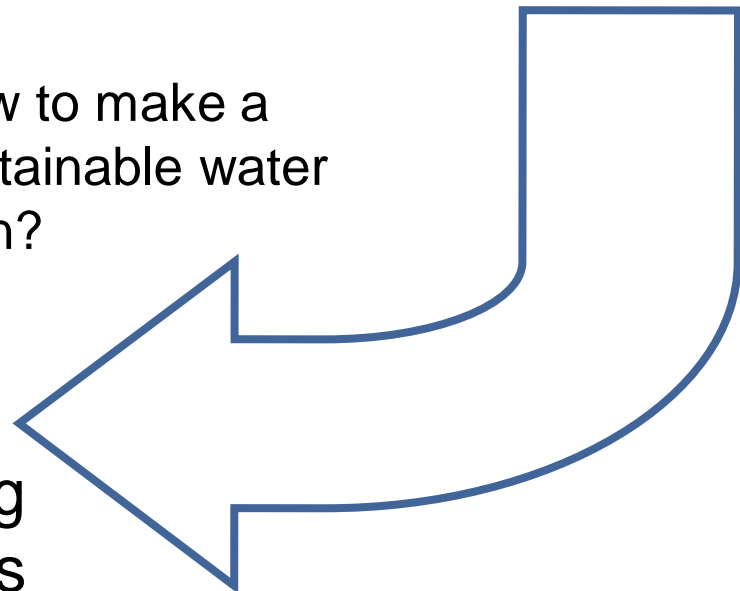
ACTORS

- ⇒ which actors,
- choices made?

How to make a sustainable water plan?

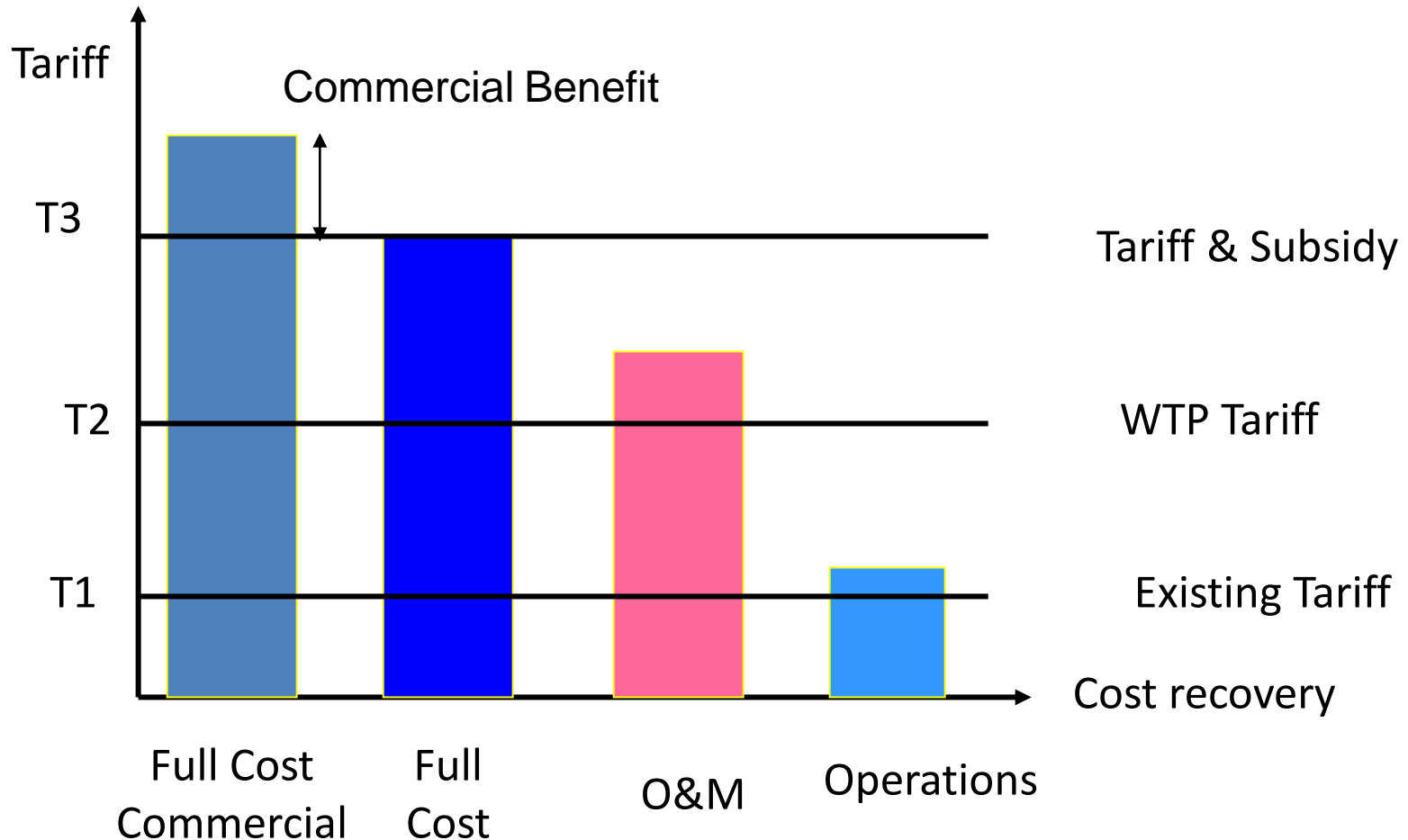
guiding models

guiding principles

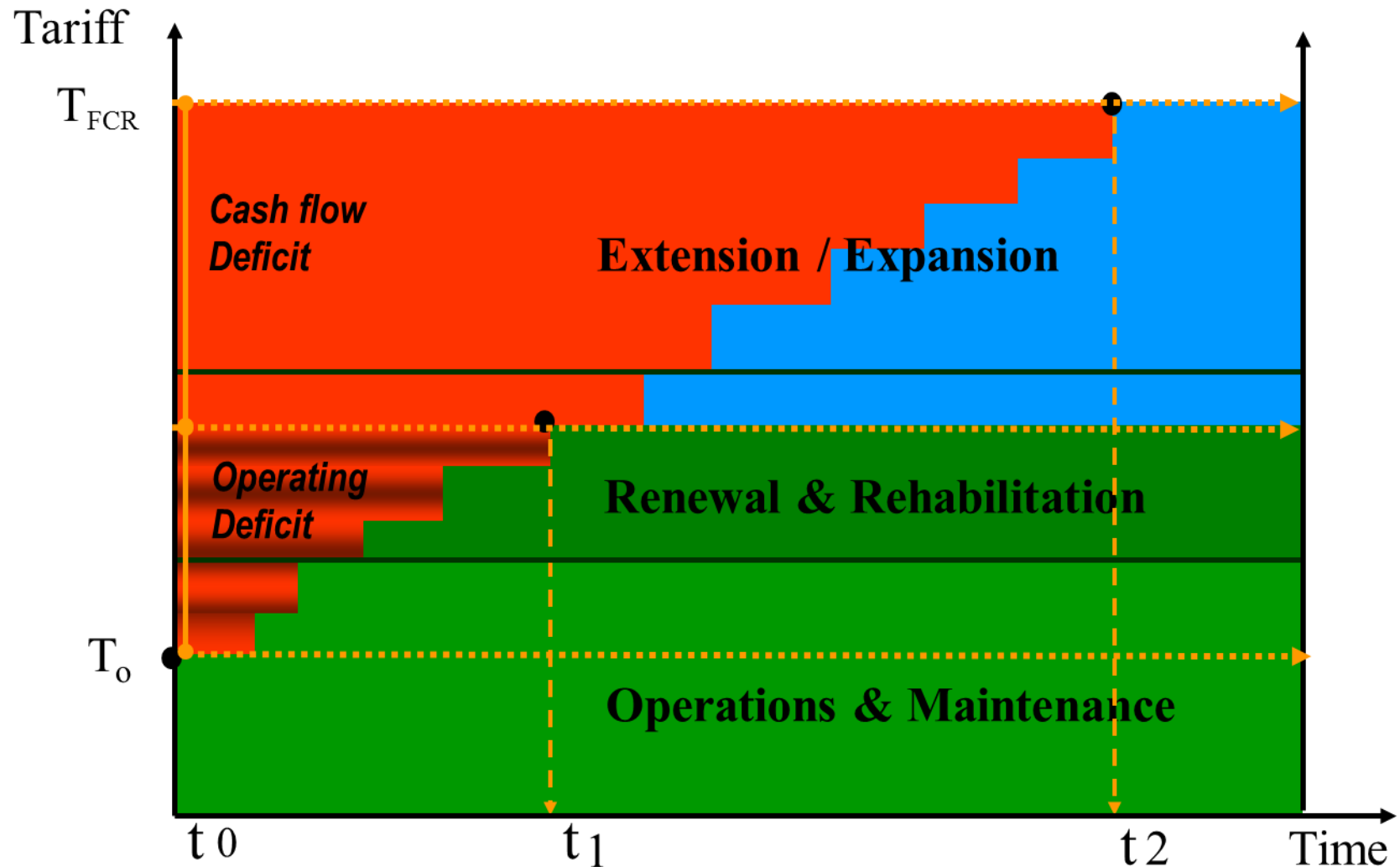


Valuing the Water – Full Cost Recovery

Cost Recovery:



Basic Service versus Environmental Service



Stakeholders & Financing for Urban Water

		Who should invest?	How to finance?
Industrial Pollution	Large Enterprises	Polluting Enterprises	<i>Polluter Pays Principle</i> Self-financing, Commercial Bank Loan, Equity-financing, Etc.
	SMEs	Polluting Enterprises	<i>Polluter Pays Principle</i> Self-financing, Commercial Bank Loan, Government assistance
		Collective Treatment Plants	<i>Polluter Pays Principle</i> User Charge Emission Charge
Public Infrastructure for Environmental Service		Public Sector + Private Involvement (PFI, Public-Private-Partnership)	<i>Public Service</i> <i>User Pays Principle</i> User charges
Nature Conservation, Natural Parks		Public Sector + Users	Government Budget, User Charges, Trust Fund, Etc.

Private Sector Participation in Urban Water

Management by Private Sector	Contracting (Short-term contracts Competitive tenders, Government ownership) Transfer and disposal of waste collection Operation & maintenance Supply of equipment	Concession (Long-term contracts, Competitive tenders Volume guarantees, Monopoly Ownership by government or private sector Payment by government / customers) Full concession contract Build-own-operate-transfer Build-operate-transfer	Franchise (Long-term contracts, Competitive tenders Monopoly Ownership by private sector Payment by government / customers)	Open Competition Market based system Between private sector Regulated by government Ownership by private sector Capacity decisions by private sector
	Ownership and Investment by Private Sector			

Urban Water Augmentation Tapping every drop - Singapore

FOCUS Water

MAKING EVERY DROP COUNT

At independence in 1965, Singapore's water sources included rainwater collected in three small reservoirs and imports from Malaysia. This was enough for two million people. Today, two thirds of the island does the job of catching every single drop of rain and waste water. This huge catchment area comprises 17 reservoirs and a maze of drains, canals and rivers. This, together with water treatment facilities such as NEWater, desalination and water reclamation plants, is part of the masterplan to ensure not a drop goes to waste.

Water from Malaysia

Singapore's imported water from Malaysia flows through pipes that run along the Woodlands Causeway connecting the two nations.



Desalination

SingSpring Desalination Plant opened in 2005. One of Asia's largest and among the most energy efficient, it produces 10% of the nation's water. A second desalination plant will open in 2013, featuring the world's largest pre-treatment membrane facility. The plan is to increase desalination capacity 10-fold so it can provide 30% of Singapore's water by 2060.

Oldest Reservoirs

MacRitchie Reservoir is Singapore's oldest. It was built in 1868 with a \$13,000 donation from philanthropist Tan Kim Seng in 1857. Singapore's largest reservoir then was joined by Peirce Reservoir, the second largest, in 1910, and the third, Seletar, in 1920.

Deep Tunnel Sewerage System

A 48km-long underground superhighway routes used water from northern and eastern Singapore to Changi Water Reclamation Plant for treatment. Phase II, the South Tunnel for southwest Singapore, will be ready by 2030.



NEWater

The first two NEWater plants opened in 2003, and two more in 2007 and 2010. NEWater makes up 30% of Singapore's supply, and most goes to industrial and commercial customers for manufacturing. A small amount of NEWater is mixed with reservoir water which is treated eventually to produce potable water. The target is to have NEWater make up 50% of Singapore's water supply by 2060.



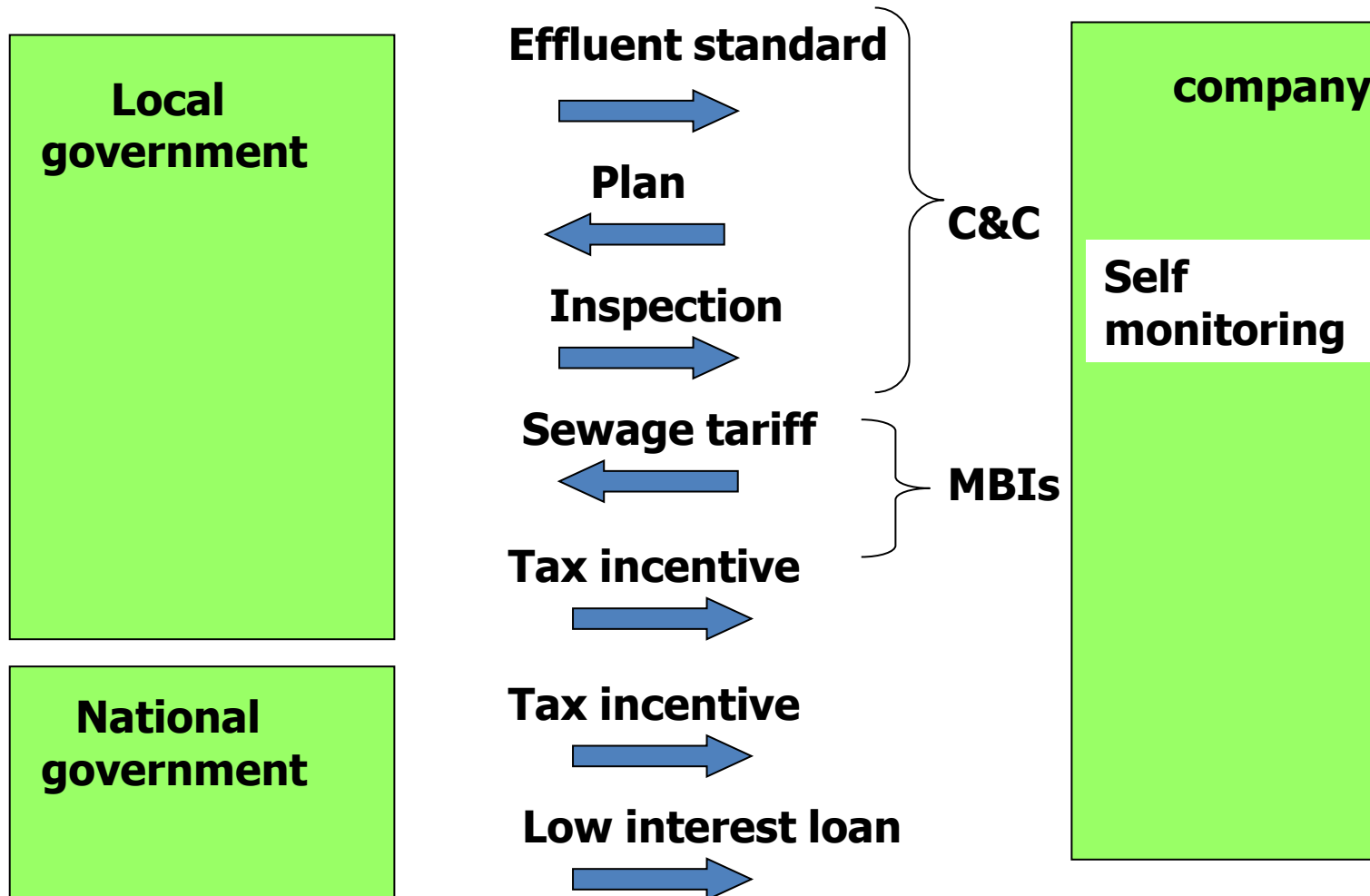
Marina Reservoir

Singapore's first reservoir in the city supplies water, controls flooding and is a lifestyle attraction. It sits in the largest catchment area, one-sixth of Singapore, and provides about 10% of the nation's water needs. The 350m Marina Barrage dam separates it from the sea.

Legend:

- Catchment Area (Central)
- Protected Water Catchment
- Desalination Plant
- Catchment Area (West)
- Catchment Area (East)
- NEWater Plant

Enabling Urban Industry to Invest in Water Augmentation - Japan



Microfinance Model for Urban Slums - Pakistan



Thank you!



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