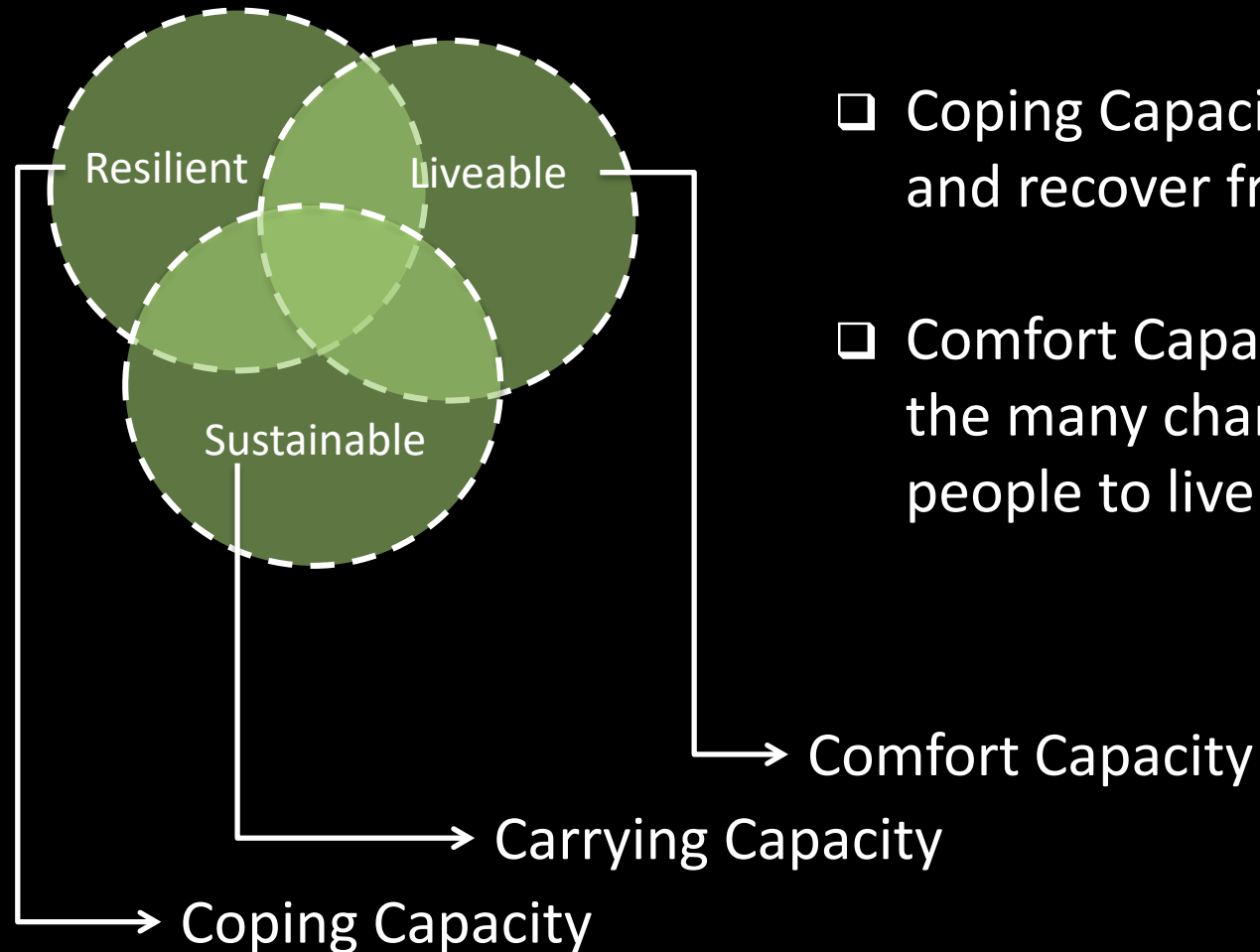


Water for Liveability:

transforming water management in cities

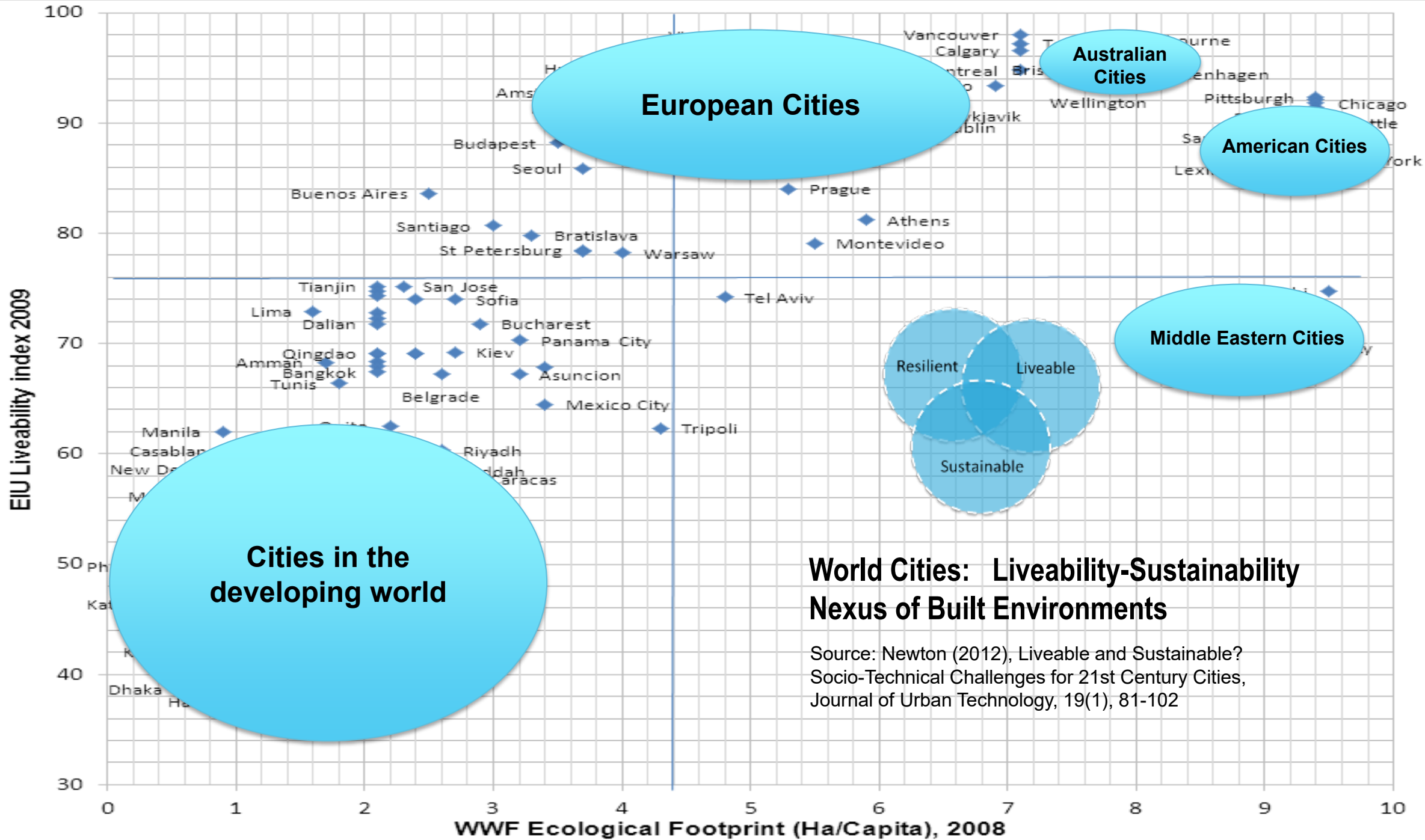


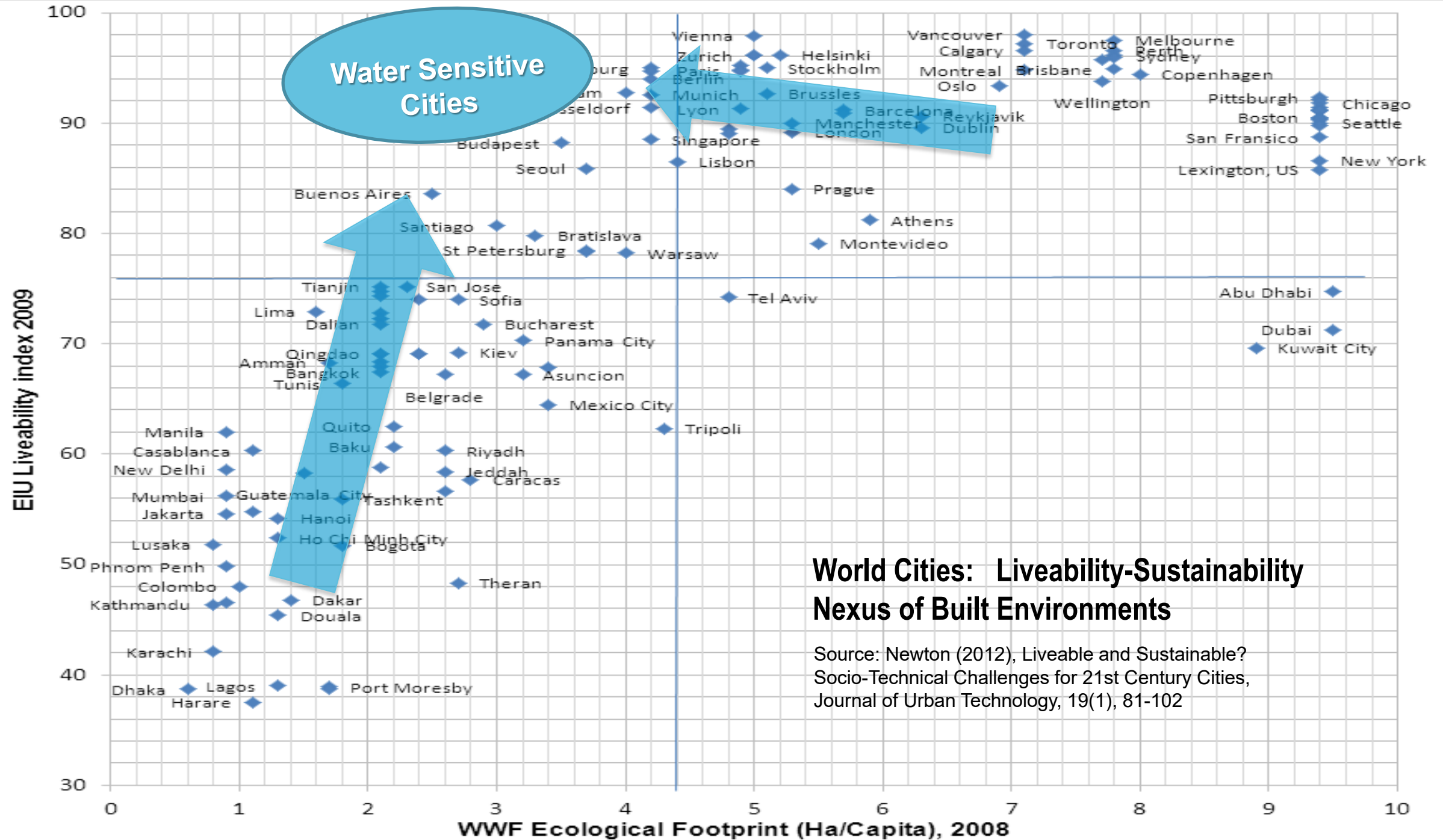
Multiple drivers, Multiple criteria & Multiple scenarios



- ❑ Carrying Capacity – ecological footprint and the planetary boundaries
- ❑ Coping Capacity – to adapt, withstand and recover from climatic extremes
- ❑ Comfort Capacity – systems supporting the many characteristics that influence people to live in a place







THE WATER SENSITIVE CITY: PRINCIPLES FOR PRACTICE

Cities as Water Supply Catchments meaning access to water through a diversity of sources at a diversity of supply scales;

Cities Providing Ecosystem Services meaning the built environment functions to supplement and support the function of the natural environment;

Cities Comprising Water Sensitive Communities meaning socio-political capital for sustainability exists and citizens' decision-making and behaviour are water sensitive.

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- Stormwater harvesting
- Groundwater Replenishment
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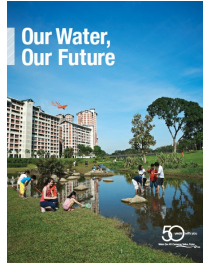
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Singapore's Our Water Our Future

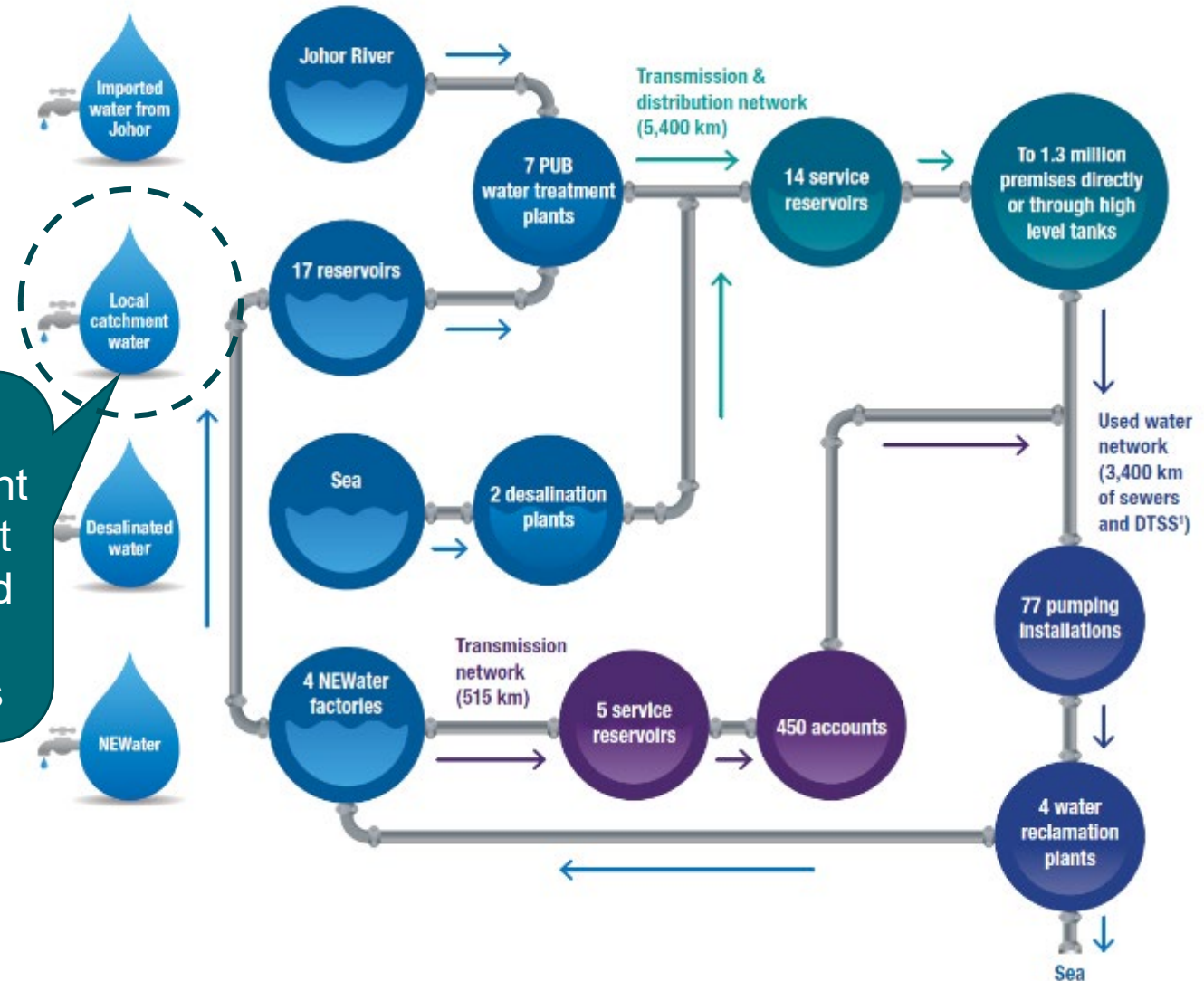
.....sets out the water strategies and plans PUB will be undertaking in the next 50 years to expand our capacities on water supply, used water management and drainage against the challenges of urbanisation, climate change and rising cost of energy.

.....how everyone in Singapore has a stake in water – as a necessary resource, an economic asset and an environmental treasure.



ABC Waters – local catchment is an important 4th tap beyond the traditional water services

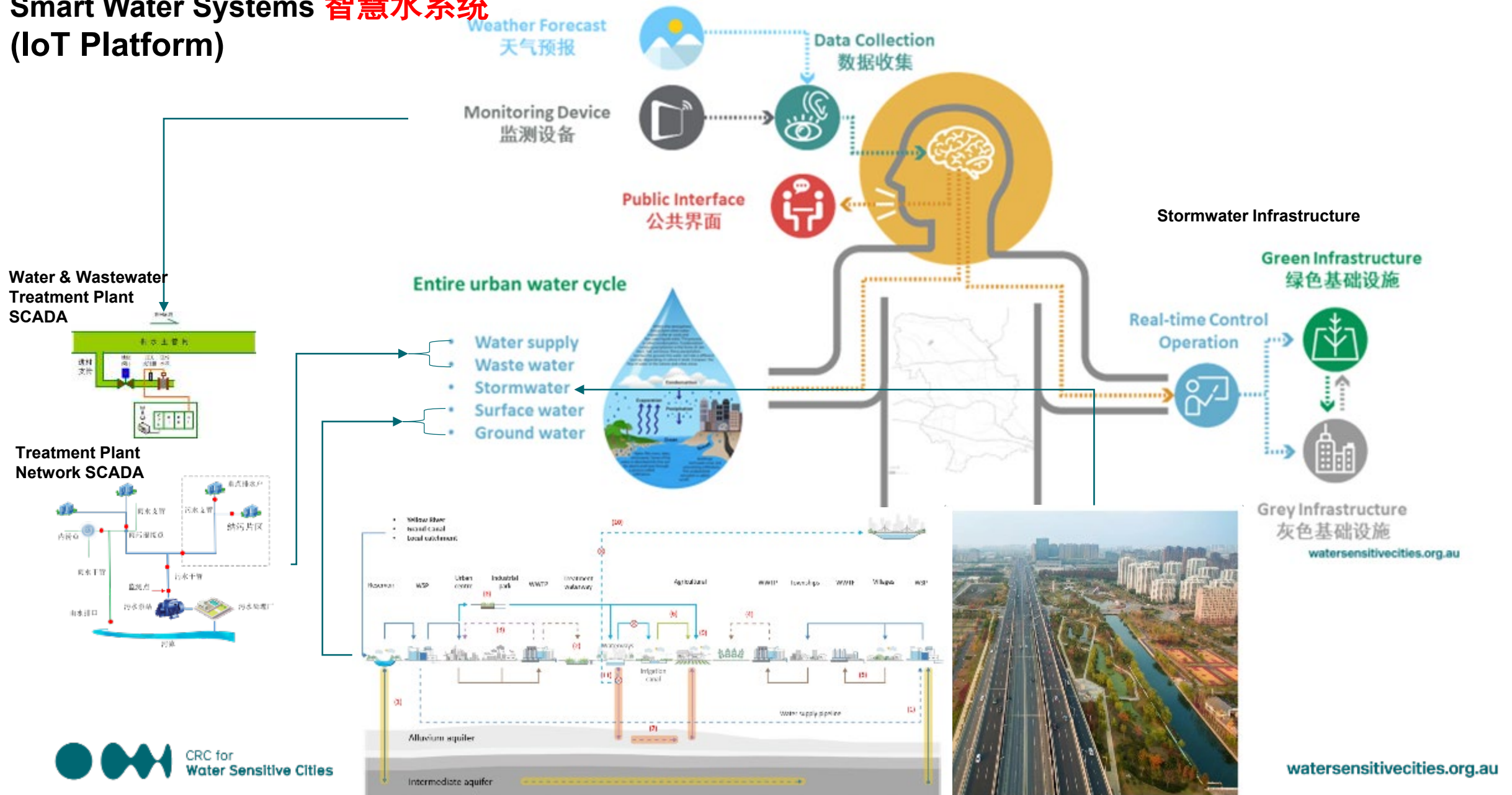
Integrated Water System



<http://www.pub.gov.sg/mpublications/OurWaterOurFuture/Pages/default.aspx>

Smart Water Systems (IoT Platform) 智慧水系统

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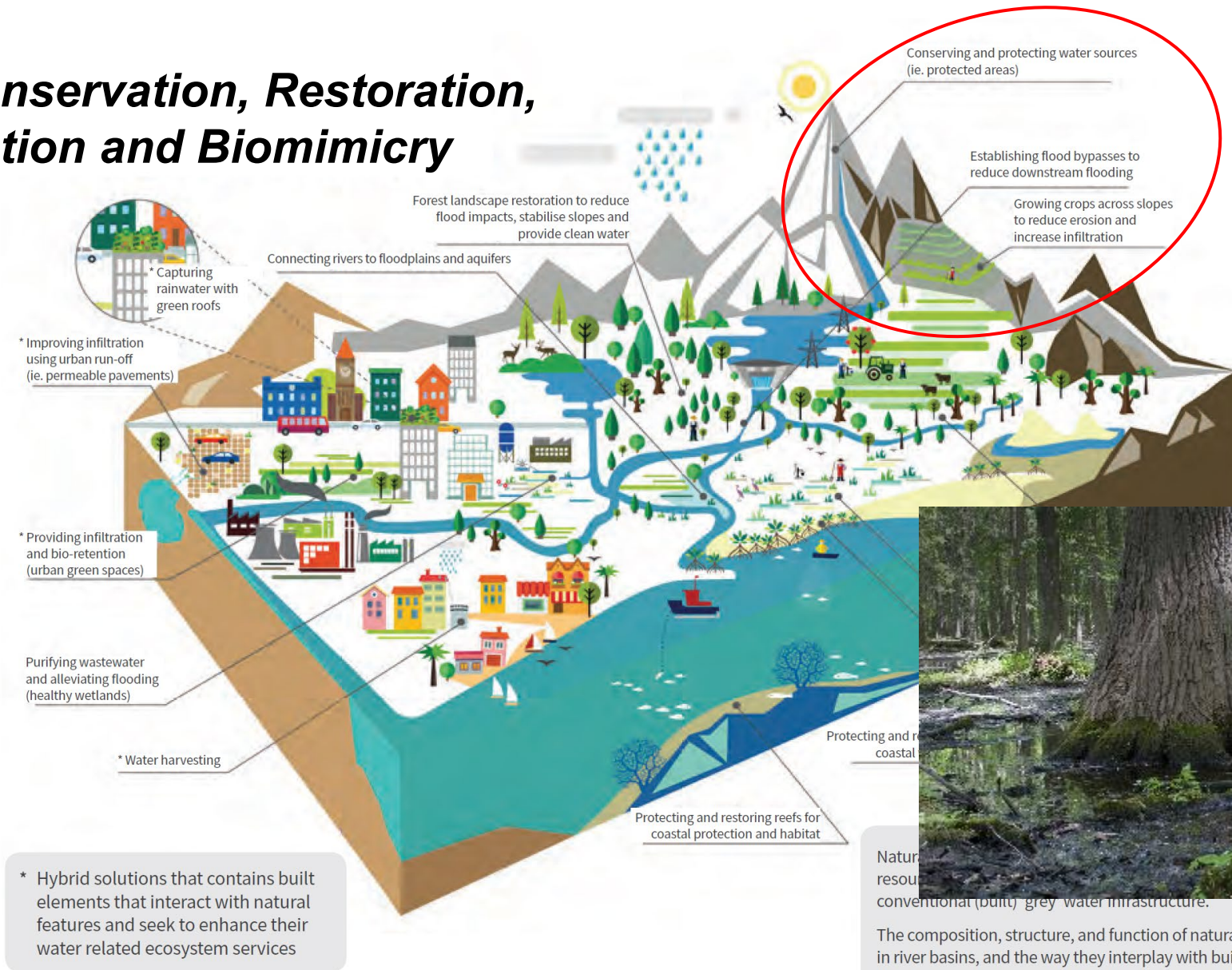
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Nature Conservation, Restoration, Rehabilitation and Biomimicry



Conservation & Restoration



Natural resources and ecosystems provide services that complement conventional (built) grey water infrastructure.

The composition, structure, and function of natural infrastructure assets in river basins, and the way they interplay with built 'grey' infrastructure will determine the primary services and co-benefits produced.

Further information can be found in UNEP-DHI/IUCN/TNC (2014).

Ecosystem Services

Source: Infographic 'Natural Infrastructure for Water Management', © IUCN Water 2015.



Nature Conservation, Restoration, Rehabilitation and Biomimicry



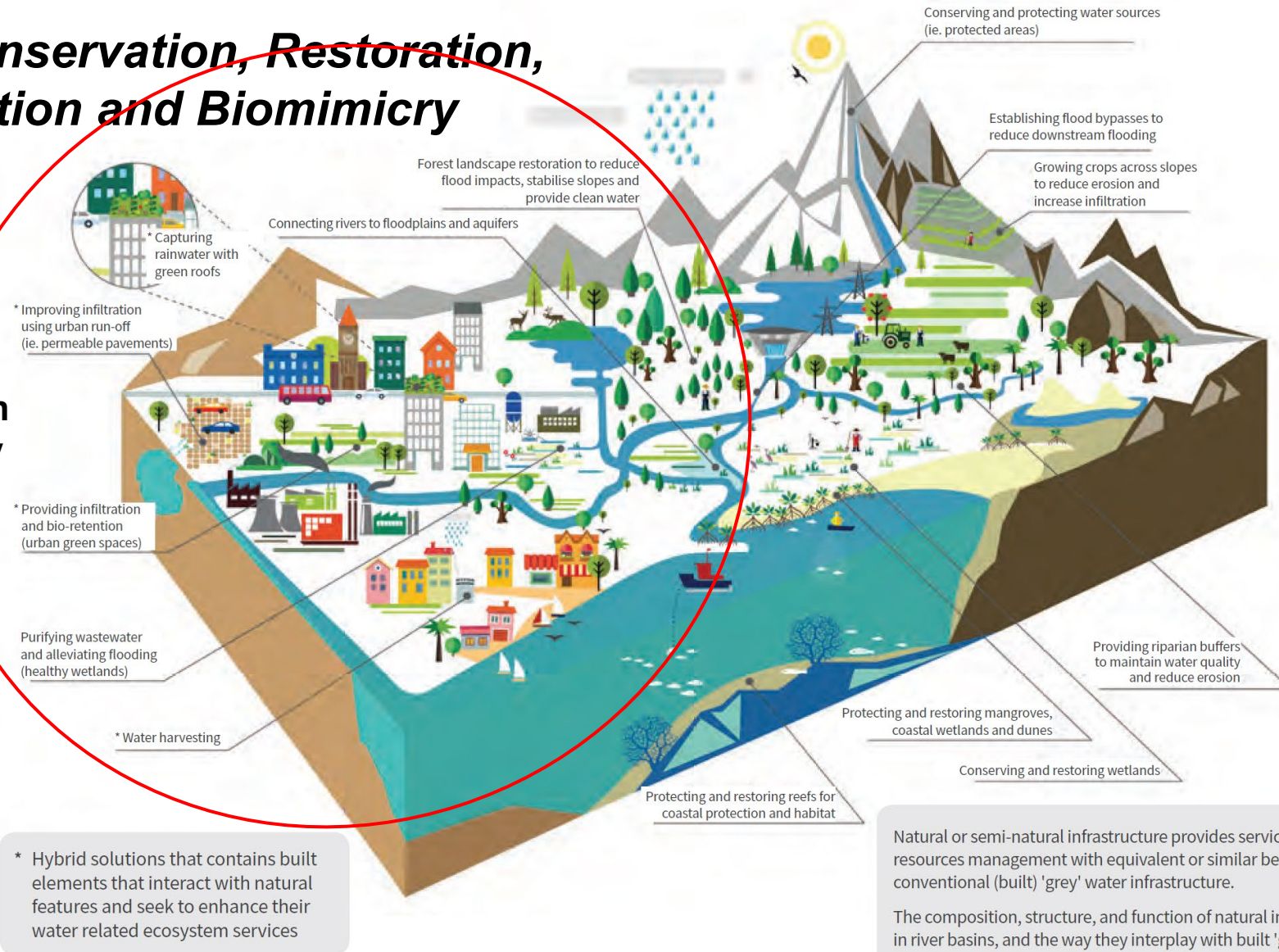
Restoration & Rehabilitation

Natural or semi-natural infrastructure resources management with equivalent conventional (built) 'grey' water infrastructure. The composition, structure, and function of natural infrastructure in river basins, and the way they are managed, will determine the primary services they provide. Further information can be found at www.recities.org.au



Nature Conservation, Restoration, Rehabilitation and Biomimicry

Rehabilitation & Biomimicry

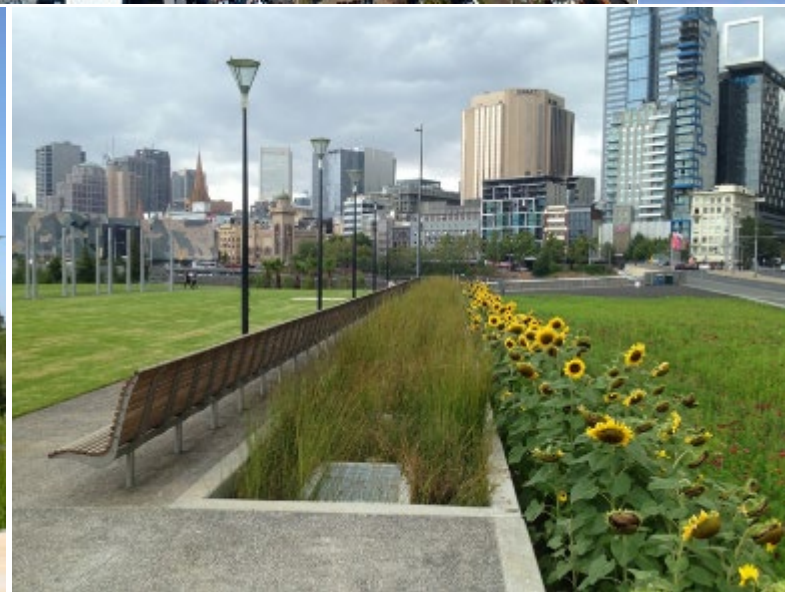
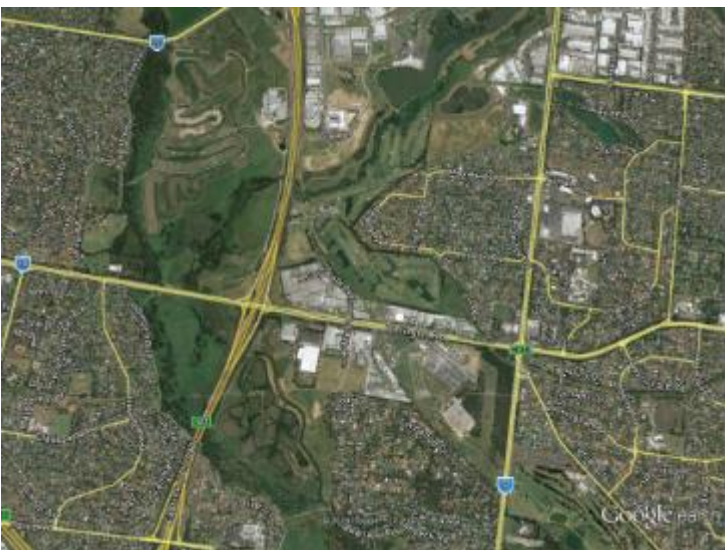


Natural or semi-natural infrastructure provides services for water resources management with equivalent or similar benefits to conventional (built) 'grey' water infrastructure.

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CRC for
Water Sensitive Cities

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ABC Waters Implementation Framework for Stormwater Management in Singapore

Regulatory and Administrative Framework

- Linked to broader sustainability policies
- Protection of Marina Reservoir
- Catchment Planning Policy
- Precinct & regional stormwater management plans
- Performance Targets
- Rating Tool & Compliance Validation

Technology Development & Implementation

Singapore Stormwater Quality Research Initiative



Demonstration Projects

Engagement with other professionals

Design Guidelines & Standards

Operation & Maintenance

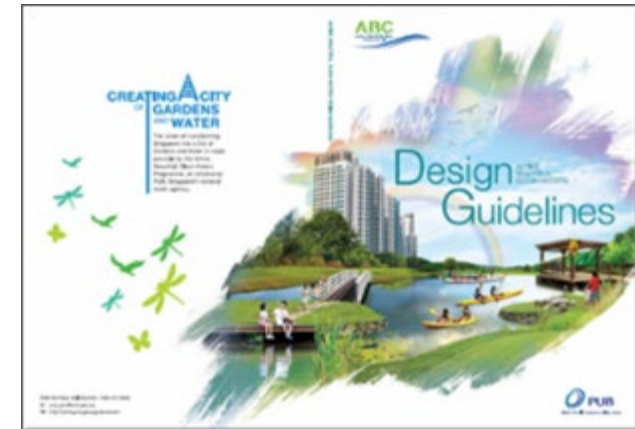
ABC Waters Certification

Building Industry Capacity

Technical Tours

Training

Tertiary Education



Strengthening the delivery of WASH in urban informal settlements

Addressing multiple exposure pathways in urban environments



Department of Health
Philippines



Department of Health
Philippines



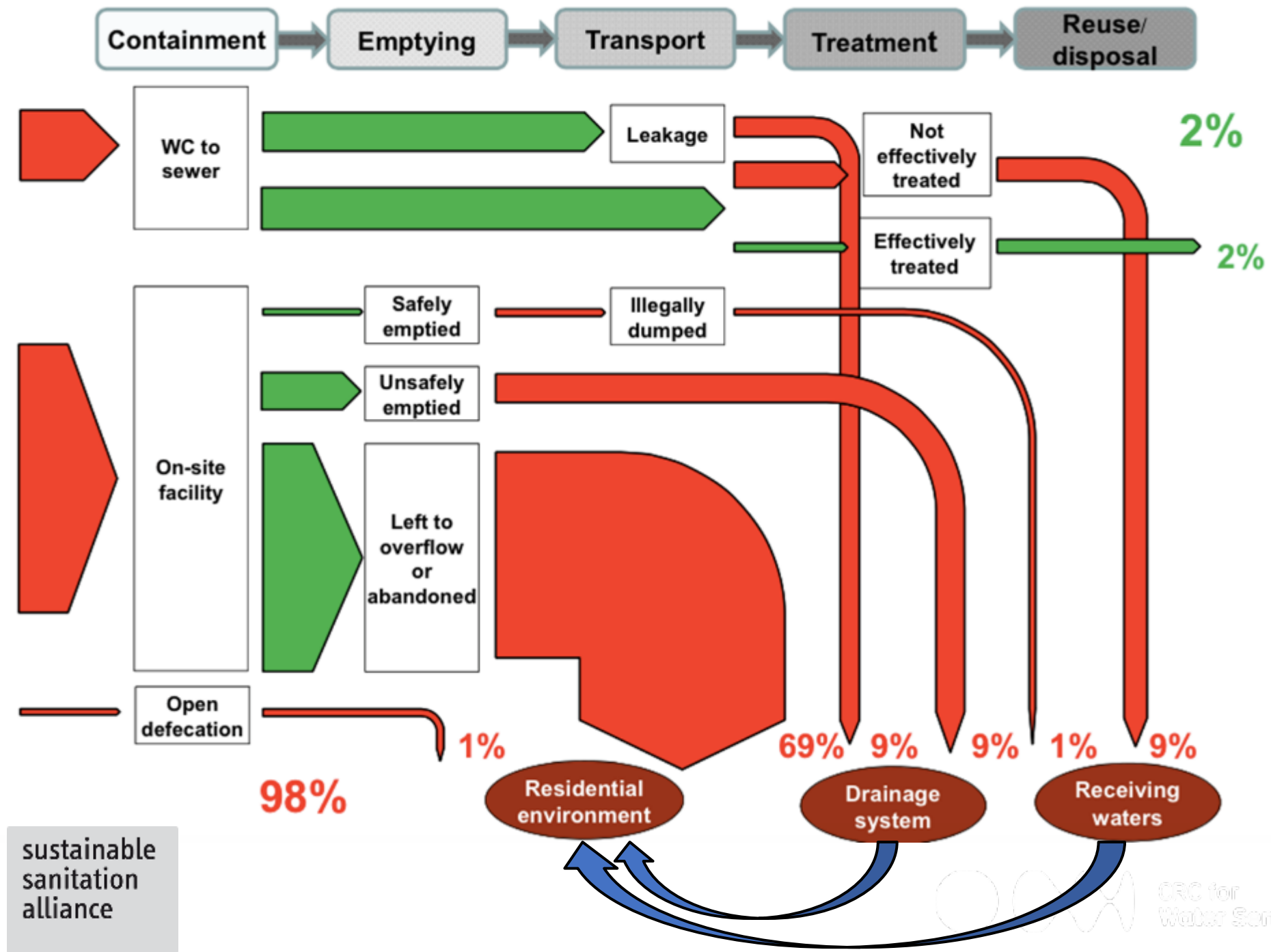
ThinkTank

Strengthening Delivery Of WaSH To Urban Informal Settlements

Health issues in informal settlements

- Diarrhoea and pneumonia are the two main worldwide killers of children under 5 years
- Gastrointestinal infections highly prevalent in informal settlements
 - Inadequate water supply, sanitation and drainage in crowded environments lead to faecal contamination of soil and water
 - Secondary effects: intestinal inflammation, stunted growth, poor cognition





Impact



Flooding | Sanitation | Water Quality | Water Sources | Productive Landscapes

Protection
from flooding
hazards

Improving
Public health

Improving
environmental
quality

Storm water
harvesting &
wastewater
recycling

Alternative water
supplies & effective use
of floodplains



rise

REVITALISING INFORMAL
SETTLEMENTS AND
THEIR ENVIRONMENTS

September 2

RISE Demonstration Site BATUA, MAKASSAR

https://players.brightcove.net/791607097001/default_default/index.html?videoId=6097260046001



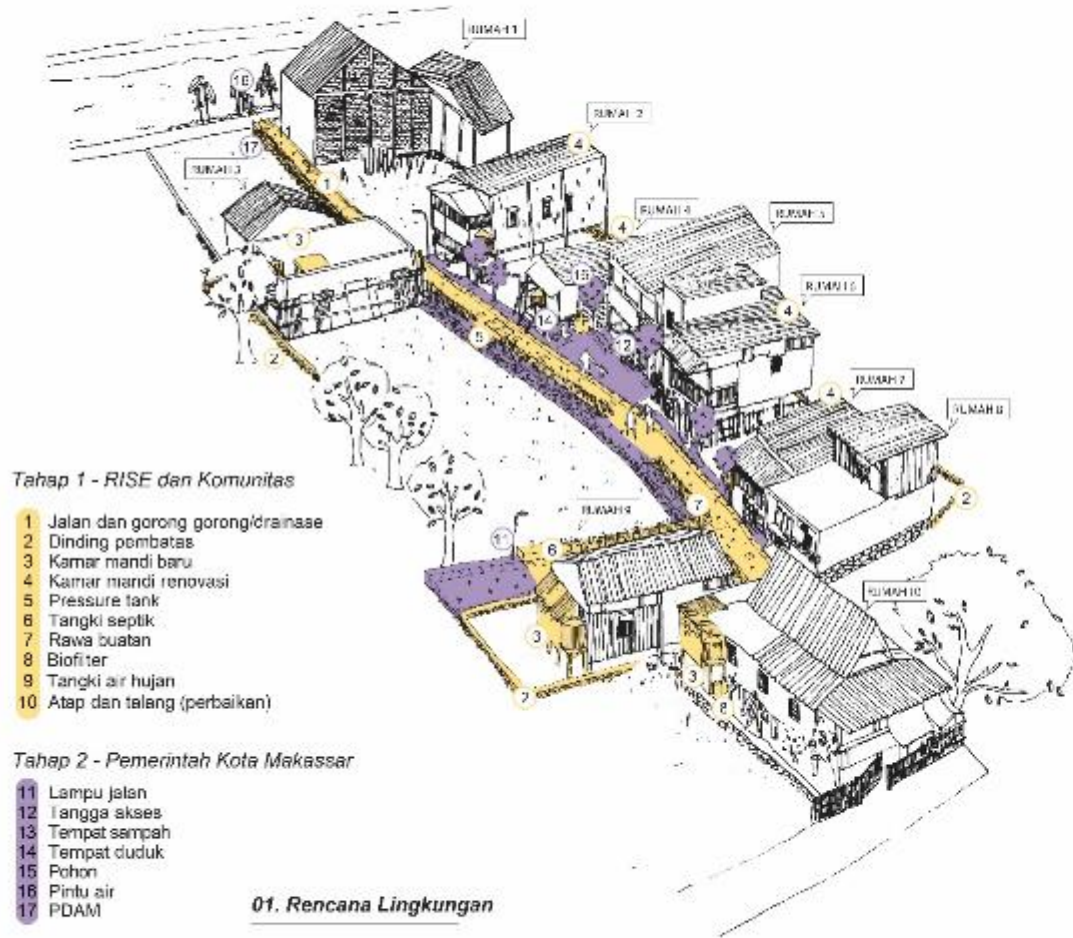
November 2017

rise

PROGRAM REVITALISASI
PERKOTAAN KUMUH
DAN LINGKUNGAN

Lokasi Percontohan 'Site Zero'

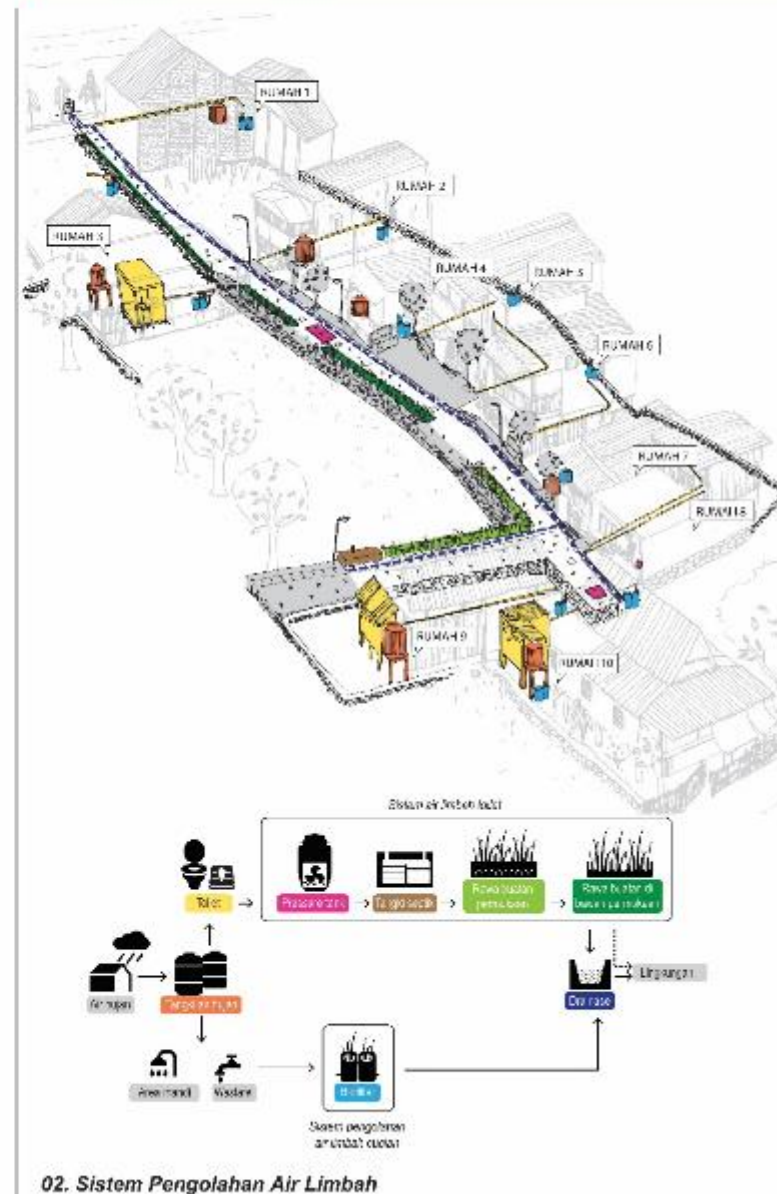
Kelurahan Batua, Kecamatan Manggala, Kota Makassar



Disetujui oleh:

Tanggal:

Tahap 1 - Bagaimana Sistem bekerja?





community construction
of demonstration project in Makassar

**contractor
construction**
of demonstration project in
Makassar





September 2017



October 2019



November 2017



October 2019

Ativo Cilia



September 2017



November 2019

rise

REVITALISING INFORMAL
SETTLEMENTS AND
THEIR ENVIRONMENTS



Rainwater tanks

Biofilters for
greywater

Wastewater
treatment

Safe
Access

rise

REVITALISING INFORMAL
SETTLEMENTS AND
THEIR ENVIRONMENTS



Water Sensitive Cities



November 2017



July 2019



October 2019



February 2020