Online International Knowledge Conclave On Green Infrastructure’

17th December 2020

KALA VAIRAVAMOORTHY, Executive Director, IWA

inspiring change

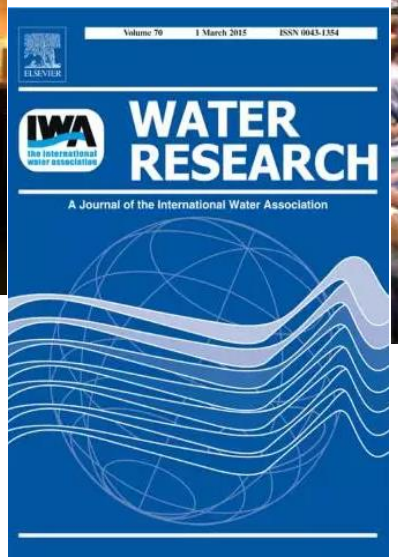
Global Network for Water Professionals spanning the continuum of research and practice

the international water association

10,000 members in 140 countries

50 Specialist Groups

17 Journals
> 800 books



Biennial Congress with over 9000 participants

Over 30 conferences/year with over 50,000 participants

Leading edge technologies and best practices

www.iwa-network.org

IWA Engagement Platforms

Water Policy and Regulation

100+ regulators

- International Regulators Forum
- Working Group on public policy and regulation for resilience
- Working Group on Public Participation

Water-Wise Cities

25+ cities

- 100+ IWA members champion cities' endorsements
- Utilities and their cities rally urban stakeholders around a shared water vision

Basin-Connected Cities

50+ Contributing organisations

- Action Agenda (launch 09/2018)
- 12 action pathways
- Utilities and cities share best practices

Smart Utilities

250+ Utilities

Climate Smart

High performing

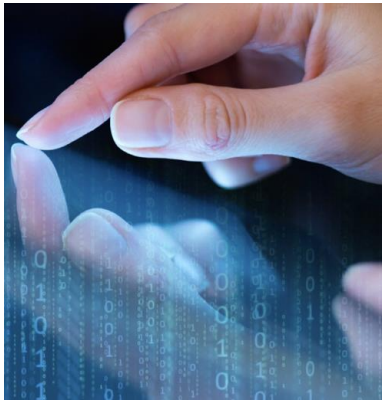
Digital transformation

- Utility Leaders Forums & Summits
- Peer-to-peer exchange
- 22+ Champions of Water-Wise Cities

Thought Leadership Areas

Water Wise Cities

Digital Water Programme



Innovators Platform

Nature for Water

Climate Smart Utilities

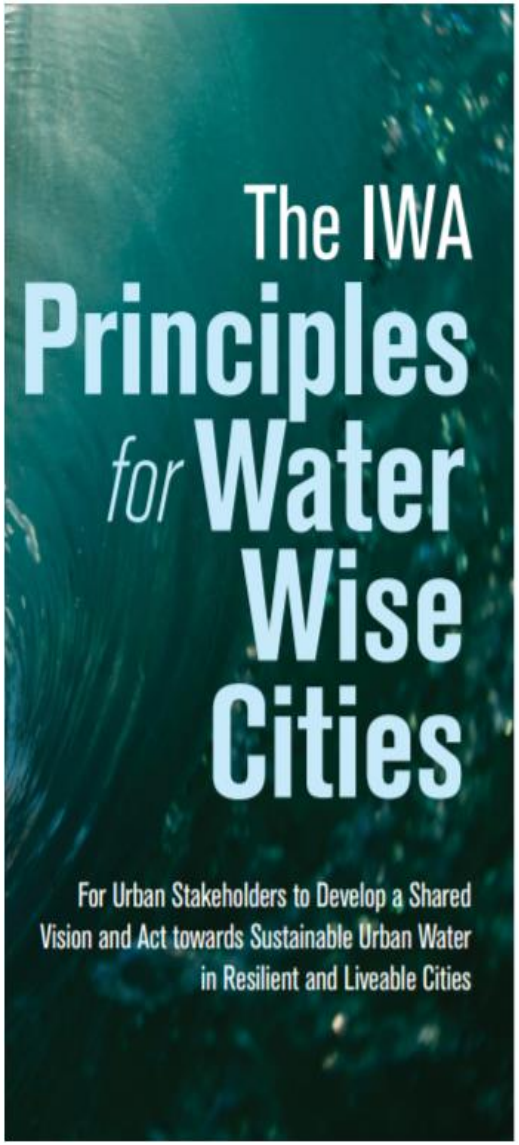
Coming soon…

Financing infrastructure to achieve the SDGs

Benefit transfer

Principles for water wise cities

the international water association



4 Levels of Action

17 Principles for Water-Wise Cities

1 Regenerative Water Services

- Replenish Waterbodies and their Ecosystems

Regenerative Water Services

- Increase the Modularity of Systems and Ensure Multiple Options

2 Water Sensitive Urban Design

- Enable Regenerative Water

Water Sensitive Urban Design

- Materials to Minimise Environmental Impact

Cities & Watershed Stewardship

- Prepare for Extreme Events

4 Water Wise Communities

- Empowered Citizens

Water Wise Communities

- Leaders that Engage and Engender Trust

5 Building Blocks

Vision | Governance | Knowledge & Capacity | Planning Tools | Implementation Tools

IWA Nature Based Solutions

Mobilizing Action Toward Nature-Based Solutions

- Promoting stronger connections between **water utilities and regulatory bodies** to integrate NBS in water utility operations
- Co-benefits of Nature-based Solutions for Water and Sanitation – development of guidance

What are the opportunities?

- Partner with IWA on developing guidance, projects, publications
- Contribute your case studies
- Join Task Group on Nature Based Solutions for Water and Sanitation
- Join the IWA Connect group on Nature-Based Solutions

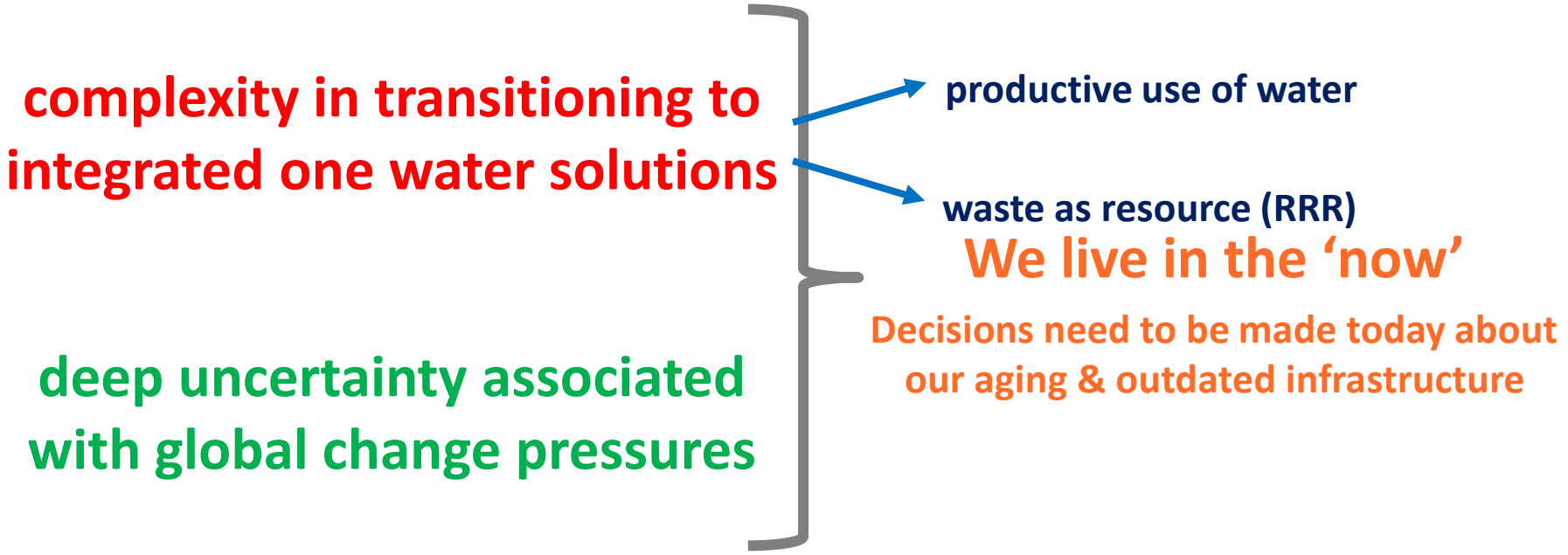
Who to contact?

Katharine Cross Katharine.Cross@iwahq.org
https://iwa-network.org/projects/nature-for-water-and-sanitation/


SCHOOL OF WATER AND WASTE
AAETI
UWE Bristol
University of the West of England
C-GINS
Compendium of Green Infrastructure Network systems
https://www.cseindia.org/c-gins/home

status quo not an option

We require a change of culture and a level of leadership unprecedented in our history

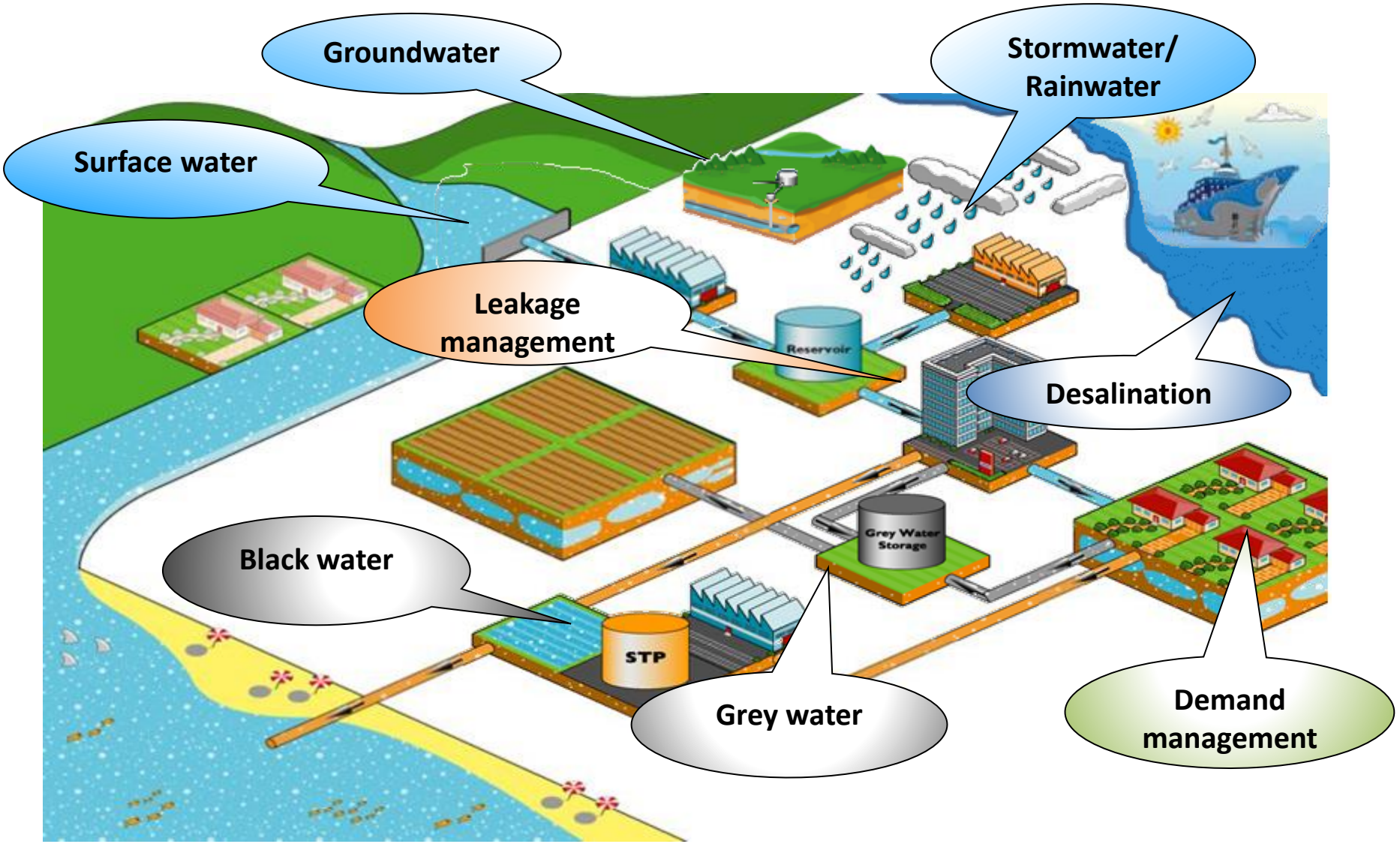


ChSt & AcSh

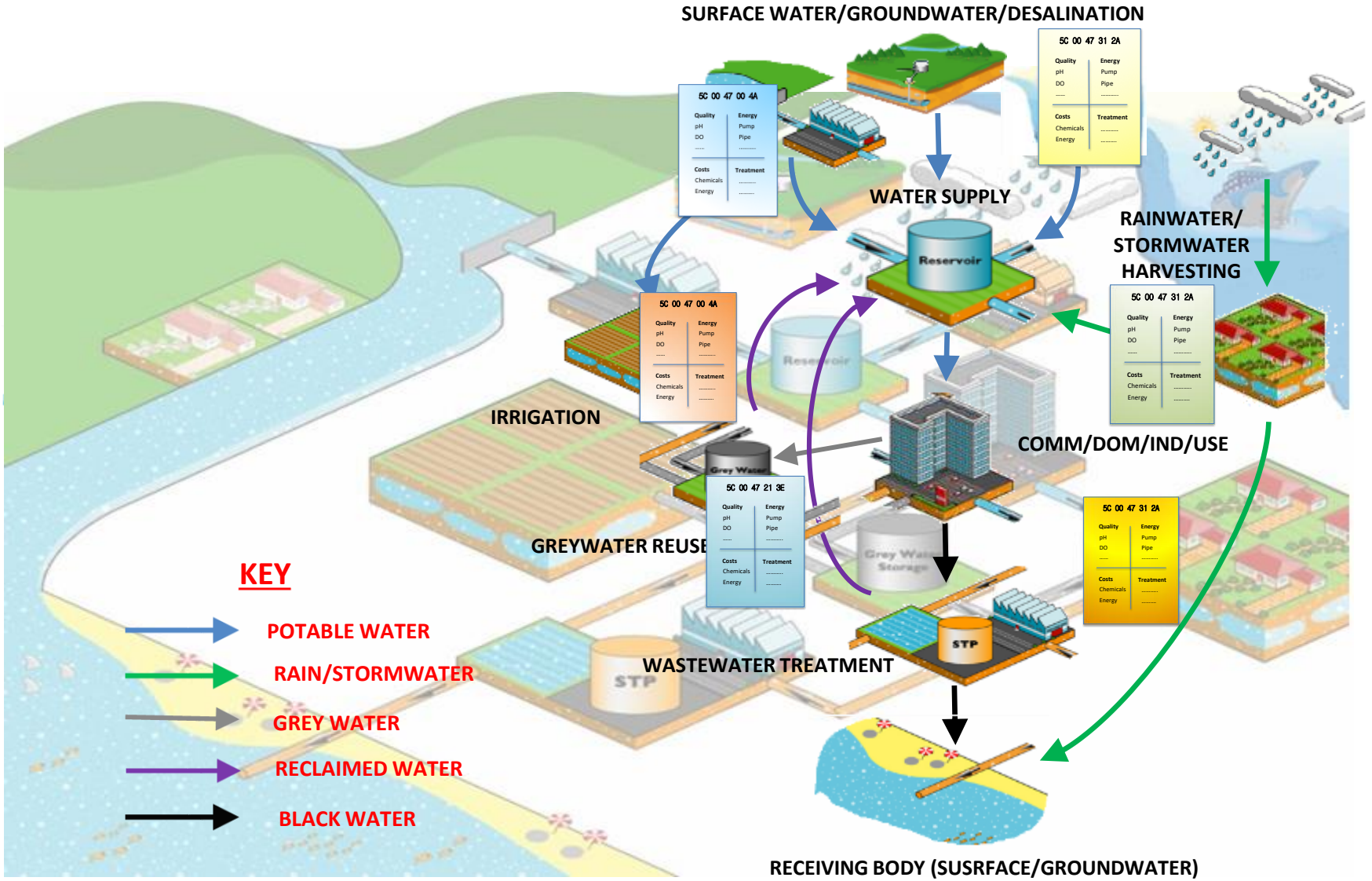
changes in perspective

productive use of water & waste as a resource

Productive use - we need to have a systems perspective of the water cycle



Modelling allows us to connect all flows for productive uses – digital ledgers help



Exploring alternative urban water solutions to rapid population growth

Water demand will at least double until 2035

ICLEI Local Governments for Sustainability

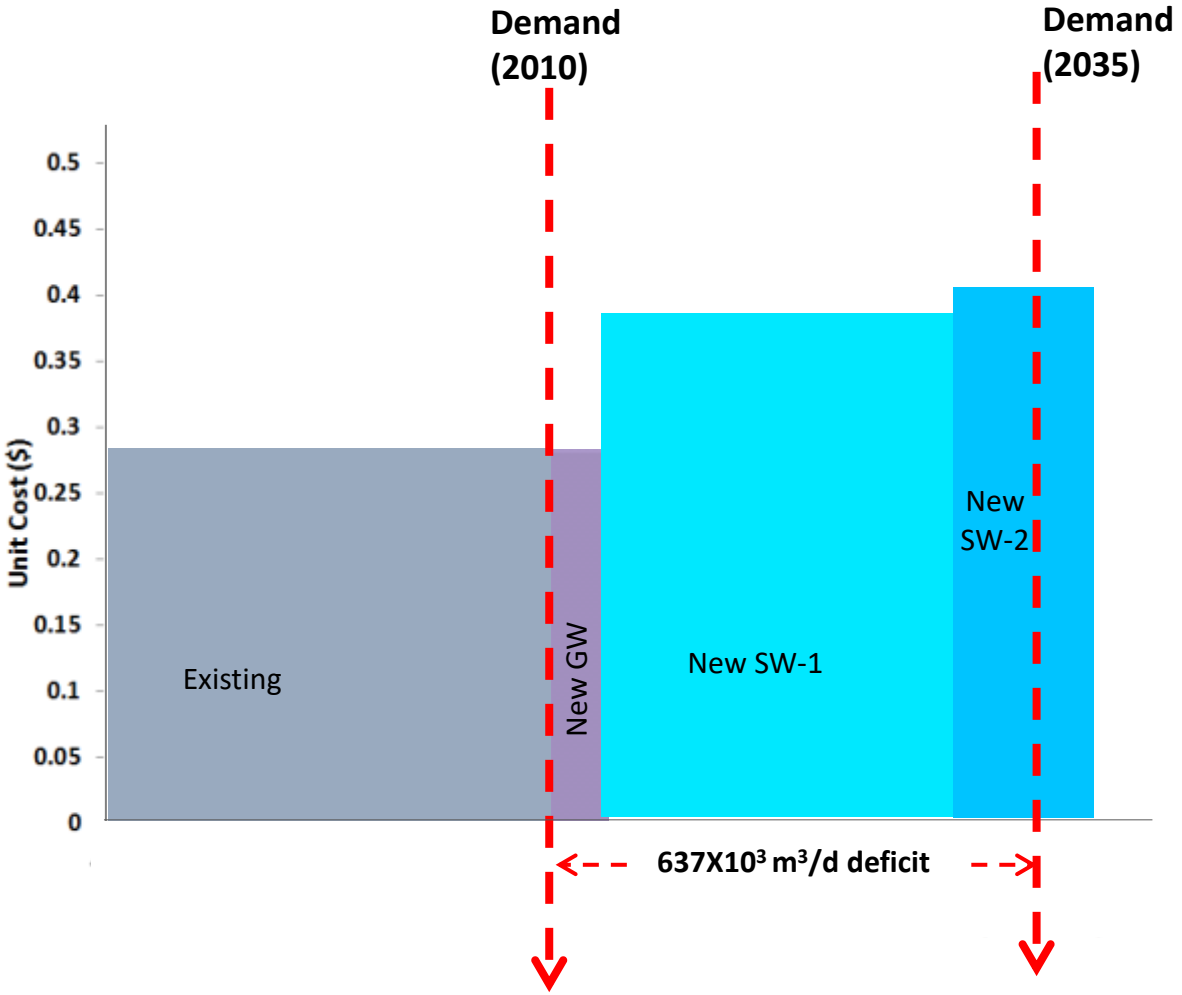
Patel College of Global Sustainability

MAKERERE UNIVERSITY

Panafcon

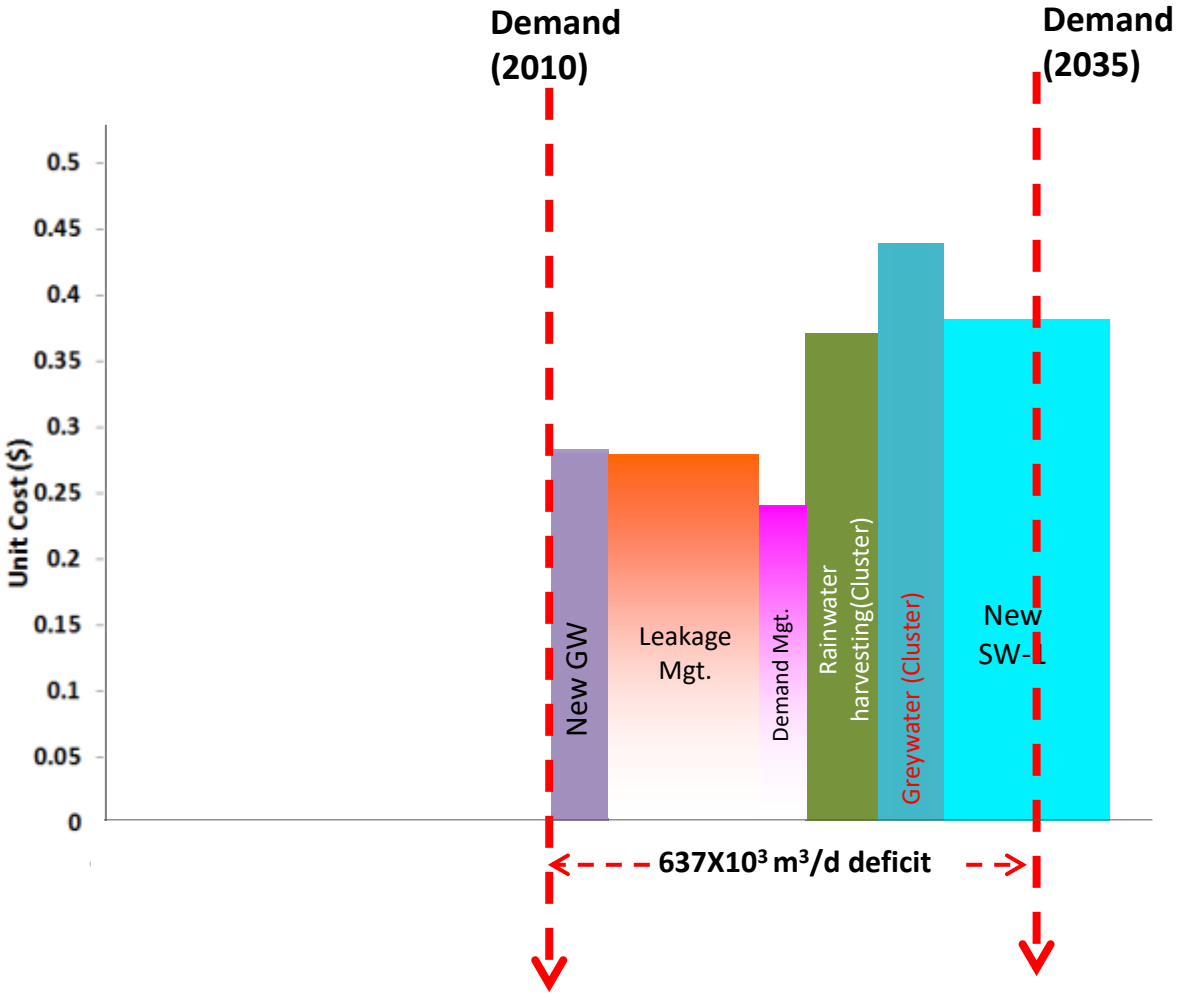
Typical solutions - import more water to meet growing needs

- Unit costs of **US$ 0.36/m3**



Need to consider non-conventional resources – a portfolio of options

- Unit costs of **US$ 0.31/m3** (cf. to 0.36)

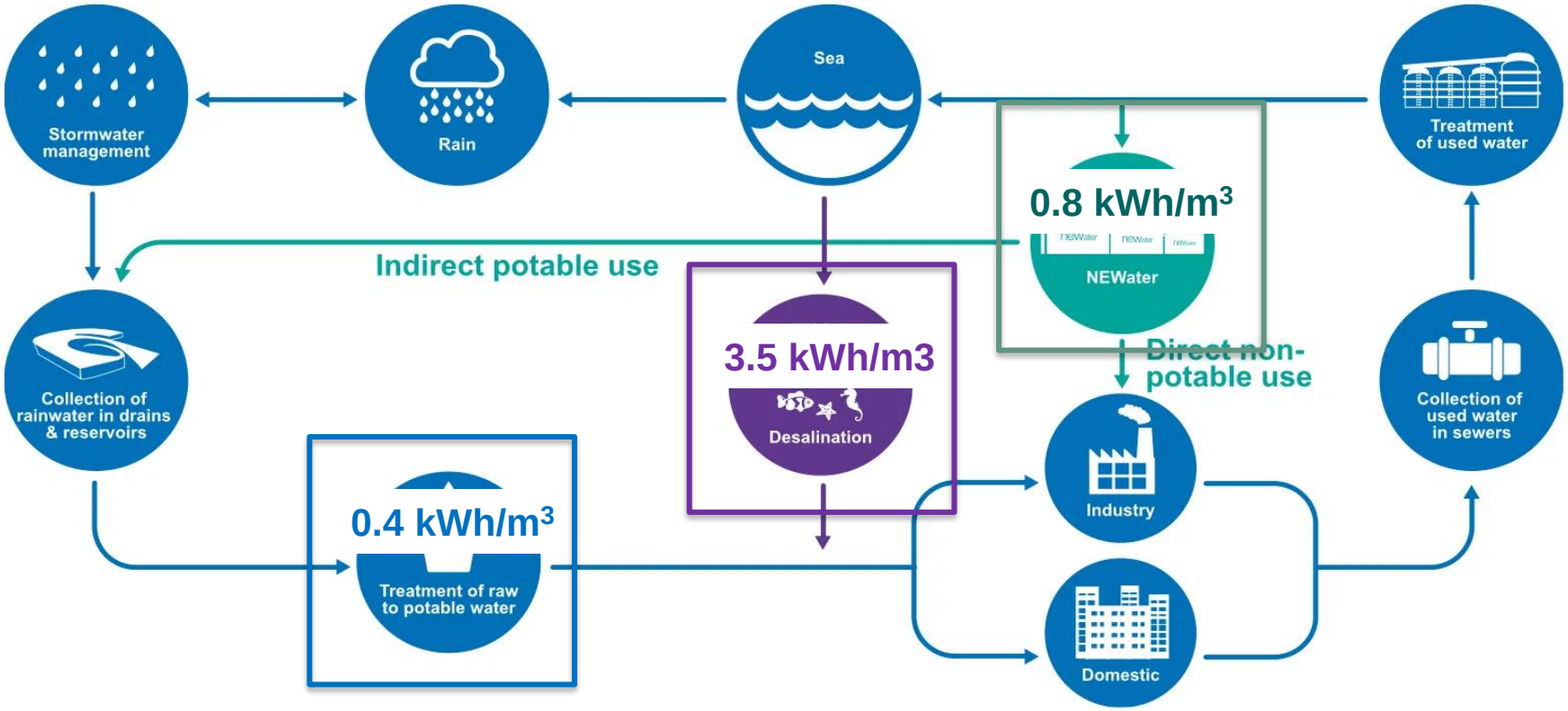


Need to consider non-conventional resources – a portfolio of options

- Unit costs of **US$ 0.4**

openknowledge.worldbank.org/handle/10986/11964

Non-conventional water sources maybe more energy intensive



www.pub.gov.sg/water

Natural systems can help reduce the energy foot-print

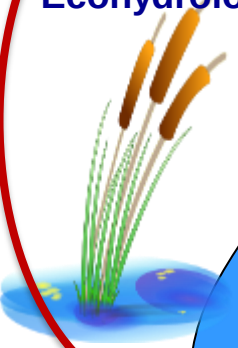
the international water association

Lake Bank Filtration

Water for Irrigation

0.012 -0.024 $/m³
(cf 0.05-0.15 $/m³)

Ecohydrology

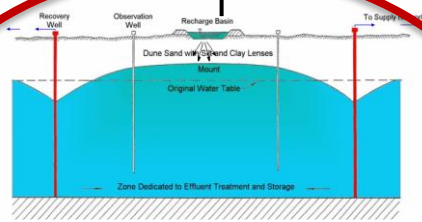


Primary Treatment and/or Constructed Wetlands, WSPs

River Bank Filtration

$0.067/m3 (cf 0.28/m3)

(0.17 $/m3)



Soil Aquifer Treatment
Artificial Recharge Recovery

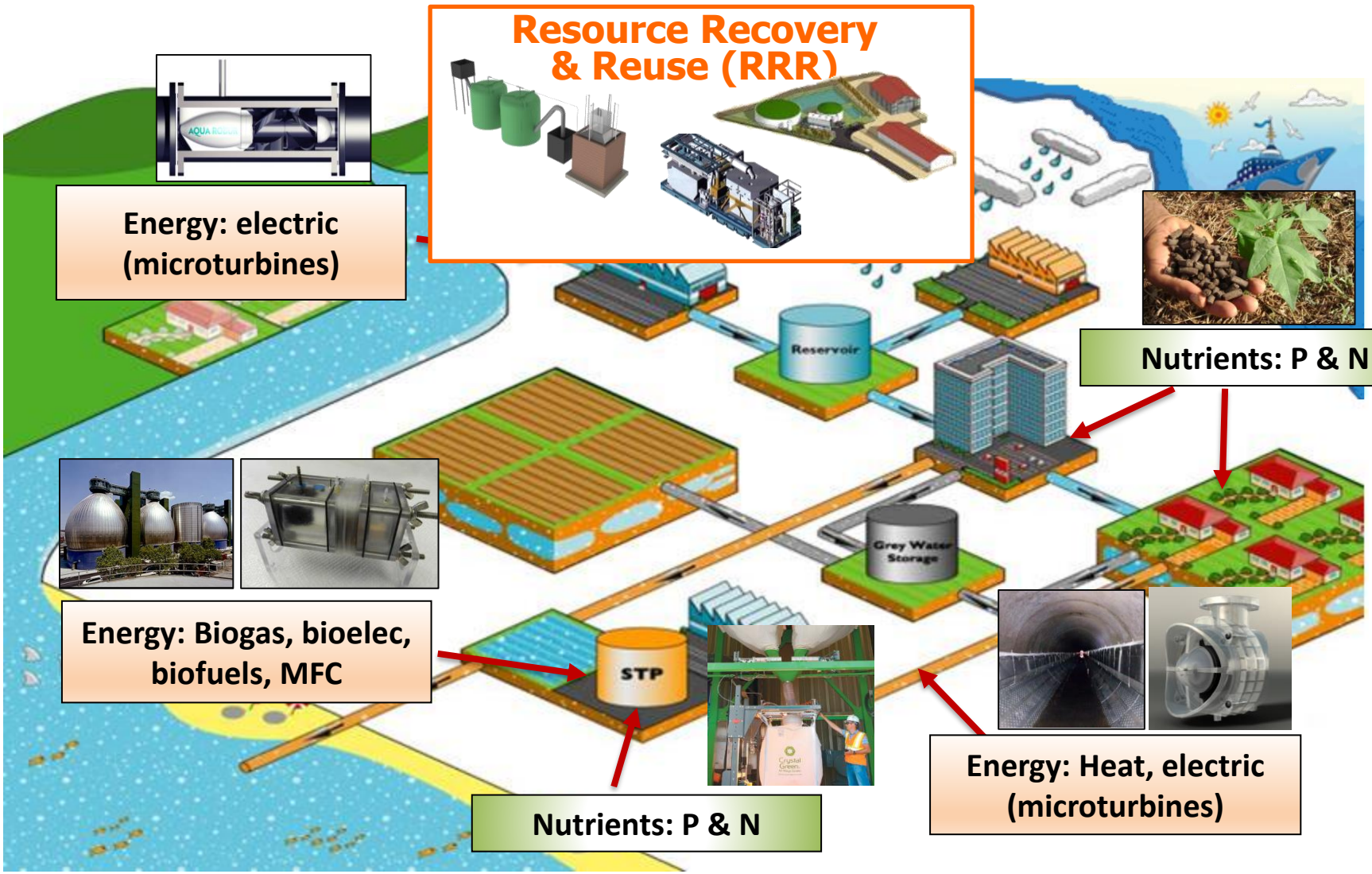
Source Water Protection

Water Treatment

WW Treatment & Reuse

Low Energy – Water Efficient' Closed Loop

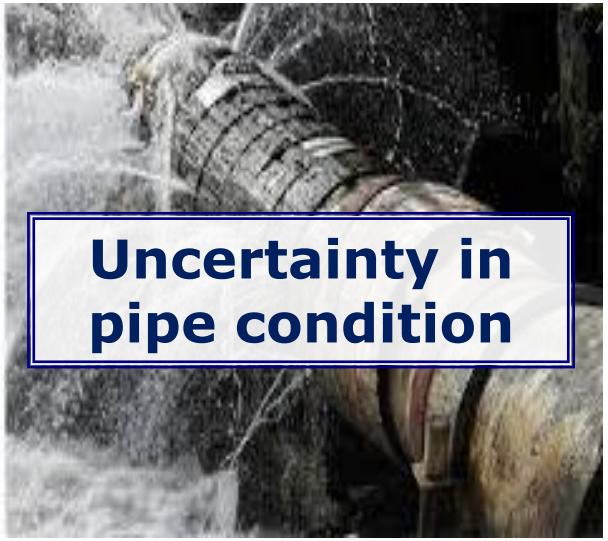
Changing our perspective creates opportunity to do things differently



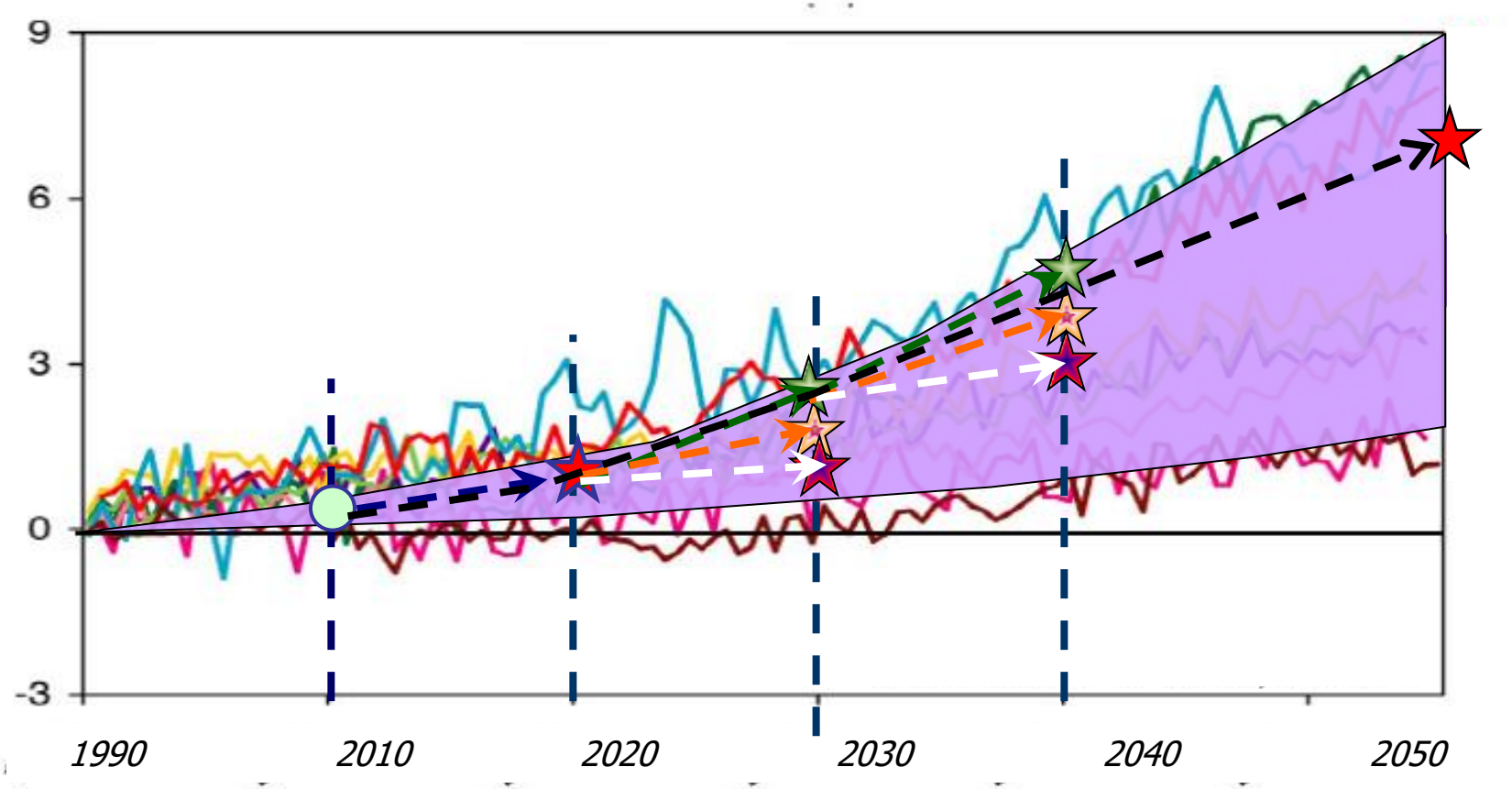
changes in perspective

water management in an uncertain world

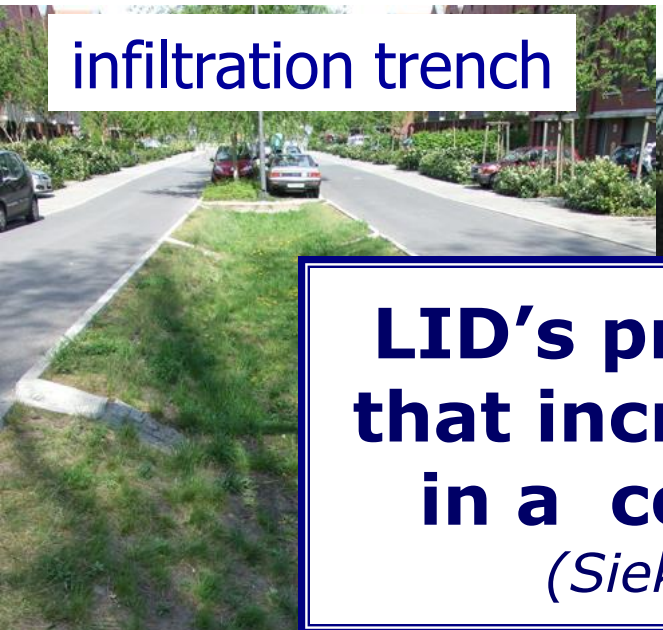
We are living in an uncertain world



We need adaptive/flexible smart systems for an uncertain world



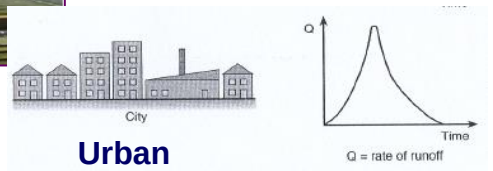
LID's are modular in nature



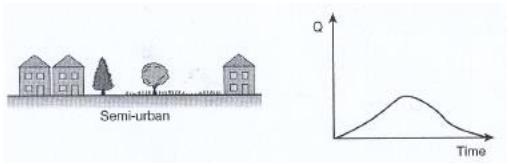
LID's provides modular diversity that increases flexibility resulting in a complex adaptive system

(Sieker et al., 2008, Eckart, 2008)

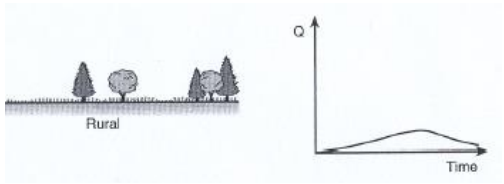
LID's provide adaptive capacity



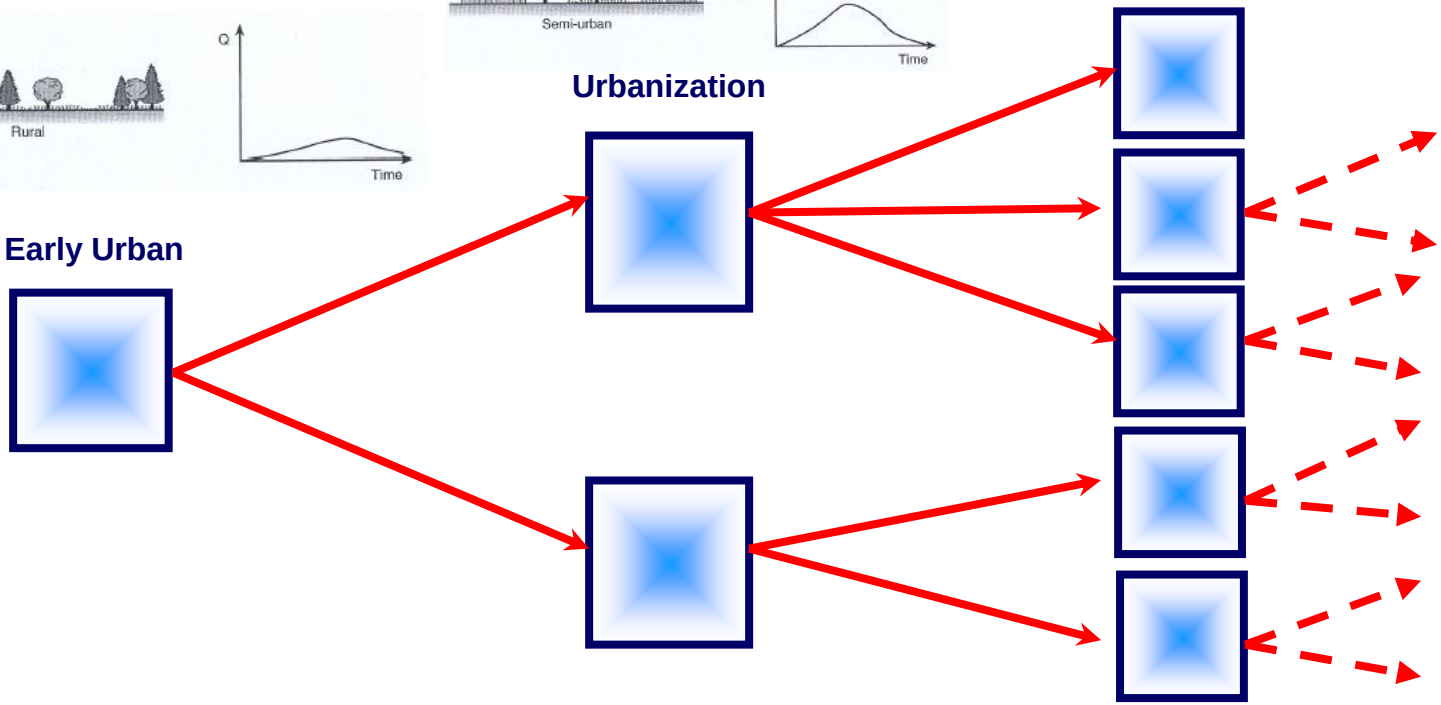
Urban



Urbanization



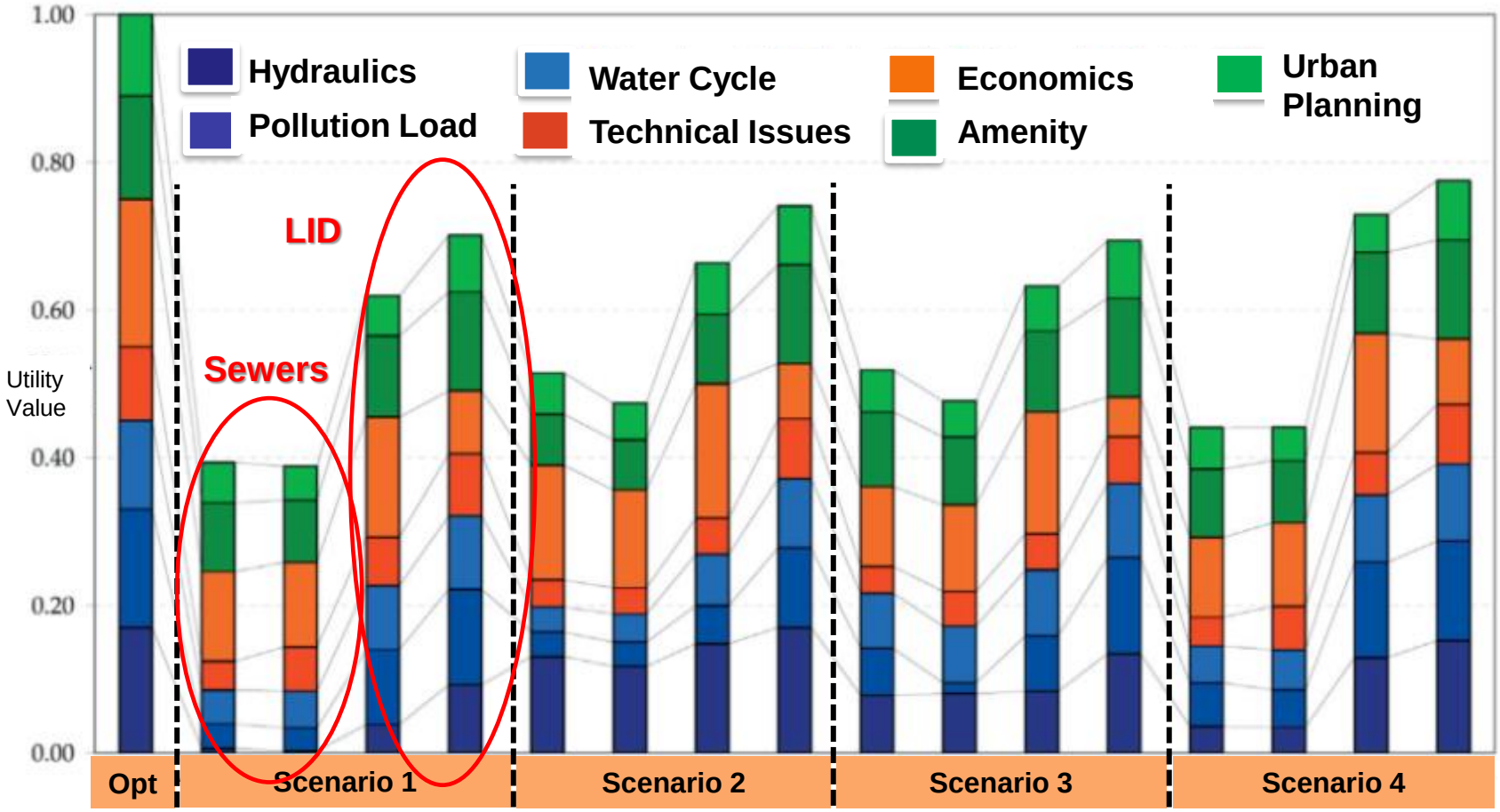
Early Urban



Time

LID's performance better against diverse future scenarios = higher flexibility

Case Study: Kupferzell Germany

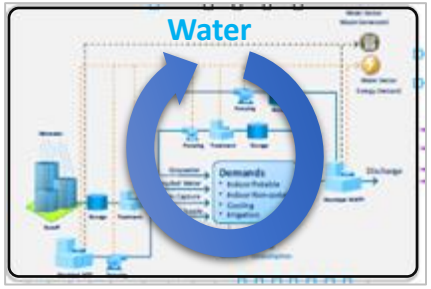


Eckart, Sieker, Vairavamoorthy (2010)

changes in perspective

we're dealing with a system of systems

It’s ok to optimize at sub-system level



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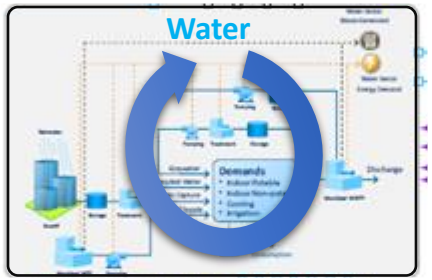
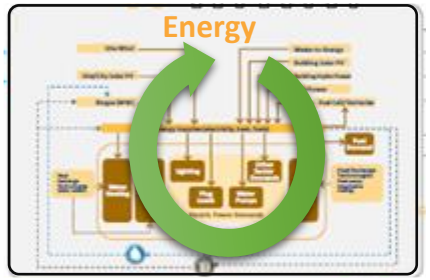
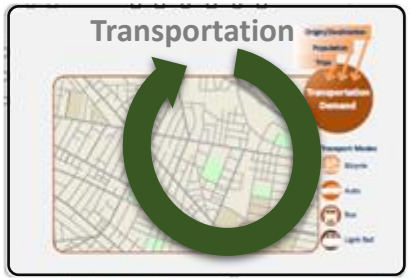
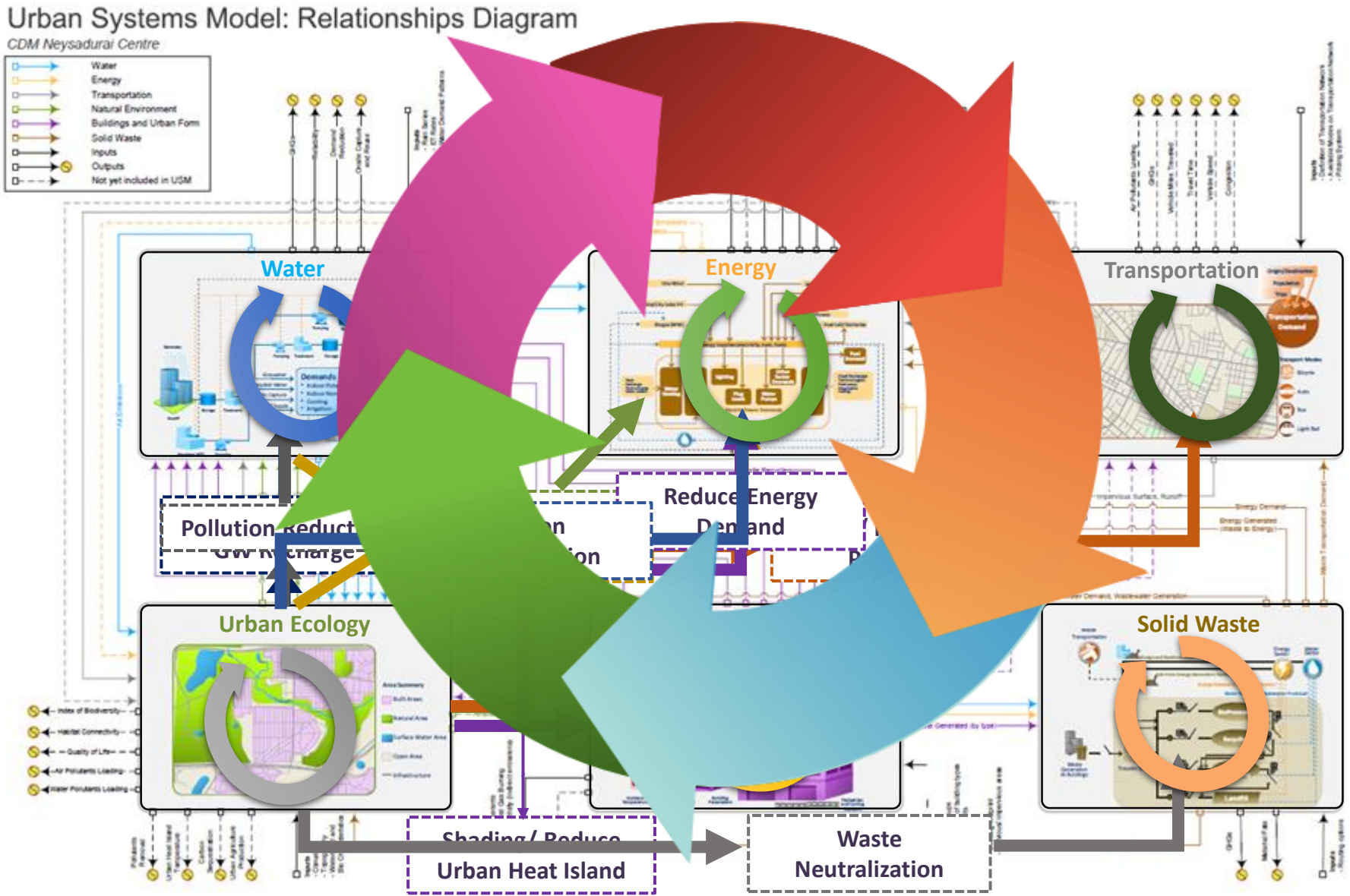






But we need to recognize that we're dealing with a 'system of systems'



We need to reset the default value in terms of what is a sustainable water utility

- **Reward** increased **water use efficiency**, **resource use efficiency**, **extraction of value from waste** streams
- **Promote** systems that are more integrated, hybrid grey & green, multi-use & multi-functional, distributed
- **Encourage** approaches and solutions that are flexible and offer increased levels of immunity to hydrologic cycle
- **Embed** these concepts into institutional strengthening and capacity building
- **Support champions** who are creating & implementing these types of systems – share success stories with others

Choices Before Us

Thank you!

Follow @IWAHQ on Twitter and share your urban water vision using **#WaterWiseCities**

IWA-Connect Group: Cities of the Future

www.iwa-network.org