



BANGKOK

Climate Resilience Pathways:

Water Security and WASH in Asia Pacific

Circular water and sanitation approaches as a pathway to build climate resilience

WEDNESDAY, 30TH APRIL

TIME: 15:30 – 17:00



Welcome!



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Session team and presenters



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UTS Institute for
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Irma Magdalena Setiono
World Bank



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Sustainable Futures



Apolonia Barreto
UNICEF Timor-Leste

Program



Presentations:
Circular Economy
principles and
resilience in water
and sanitation

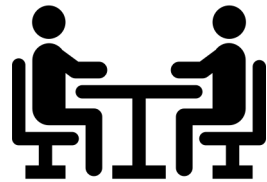
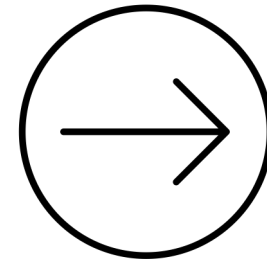


Table activity:
using the 8Rs
framework and
WICER
assessment tool



Reflections from
practice: Vietnam,
Timor-Leste,
Indonesia



Take aways: what
will you do?

Circular water and sanitation

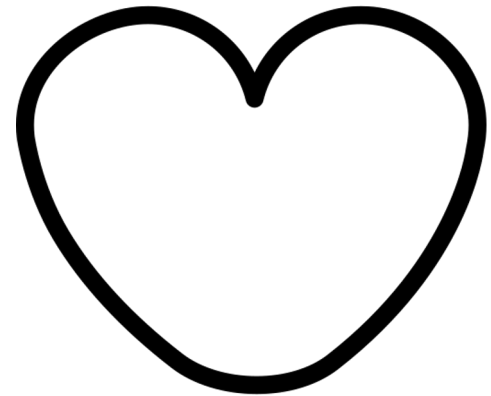
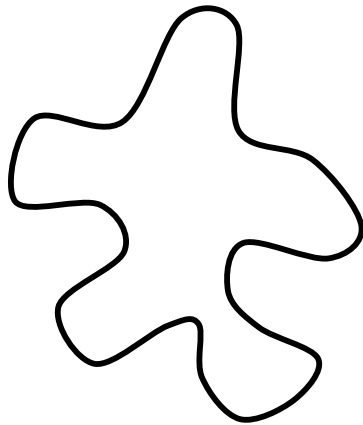
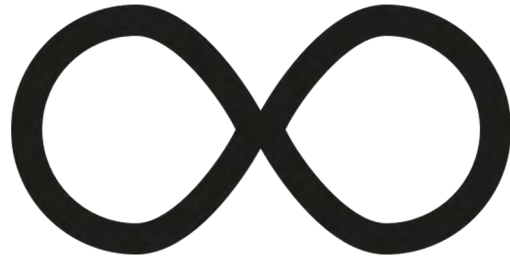
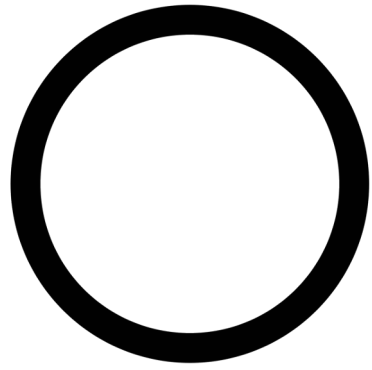
The principles of circular economy and resilience in water and sanitation

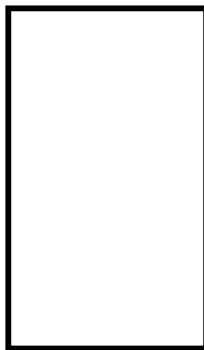
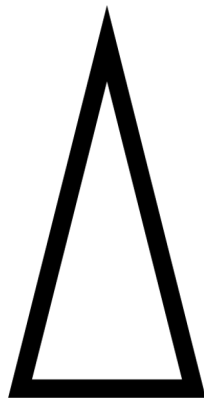
Dr Naomi Carrard and Irma Magdalena Setiono
UTS Institute for Sustainable Futures & World Bank



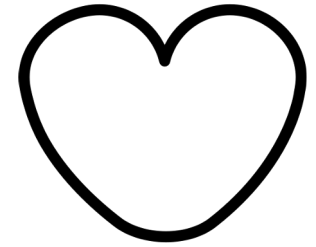
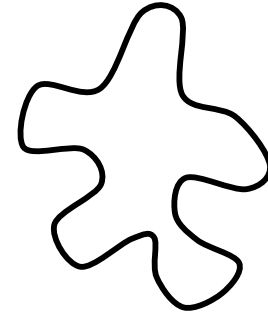
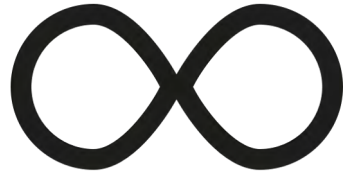
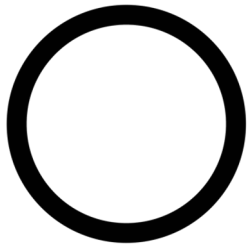
An aerial photograph of a lush green forest. A circular path, possibly a dirt or gravel trail, winds through the trees, forming a large loop. The word "Experiment" is written in white, sans-serif font in the center of the circular path. The surrounding forest is dense with various shades of green, indicating a healthy, mature ecosystem. The path is a light brownish-grey color, contrasting with the vibrant green of the trees.

Experiment

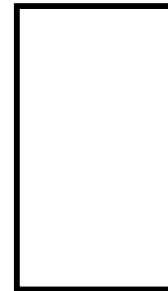




Future



Present



Circular Economy Principles Applied to Water and Sanitation

Climate Resilience Pathways: Water Security and WASH in Asia Pacific

Dr Naomi Carrard



Why should we integrate circular economy into the way we think about water and sanitation services?



For water and sanitation, circular economy concepts can drive a focus on efficiency, optimisation, resource recovery and regeneration of nature.



Circular economy practices can directly contribute to achieving multiple **SDGs**

*Progressive realisation of climate resilient, inclusive, safely managed water and sanitation services that **align with, and contribute to**, broader sustainable development ambitions.*

Who are we? This work builds on an international collaboration



CIRCLE WASH Water for Women Research

Concepts



Case studies

Ha Tinh, Vietnam
Kiritimati Island, Kiribati



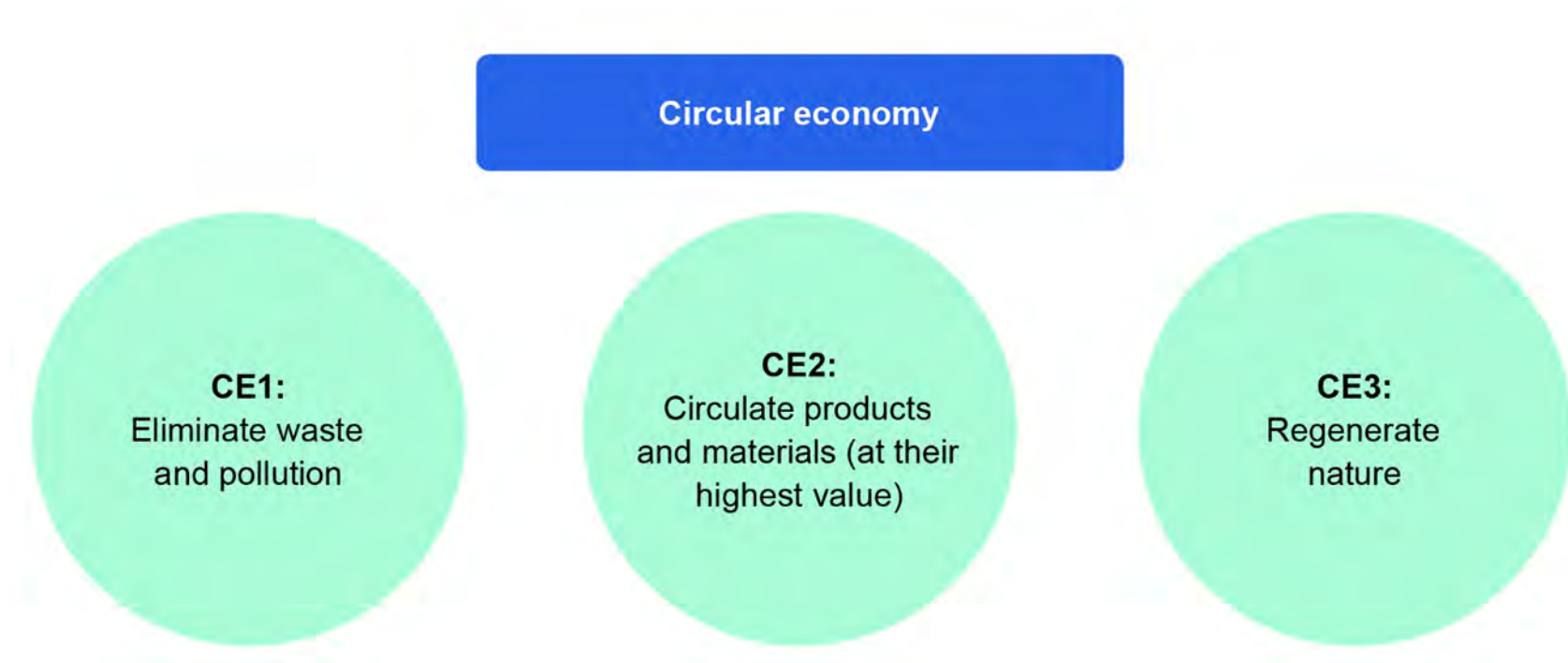
Pathways

Collaborative visioning and knowledge co-production



What is circular economy?

Circular economy is about **systems change** to decouple economic growth from the consumption of finite resources.



Where to start? Systems change must be driven by principles

To drive transformation, we must define the key **principles** underpinning our **ideal system**.

What principles help us think about how to harness circular economy in ways that achieve safe management, inclusion and **climate resilience**?

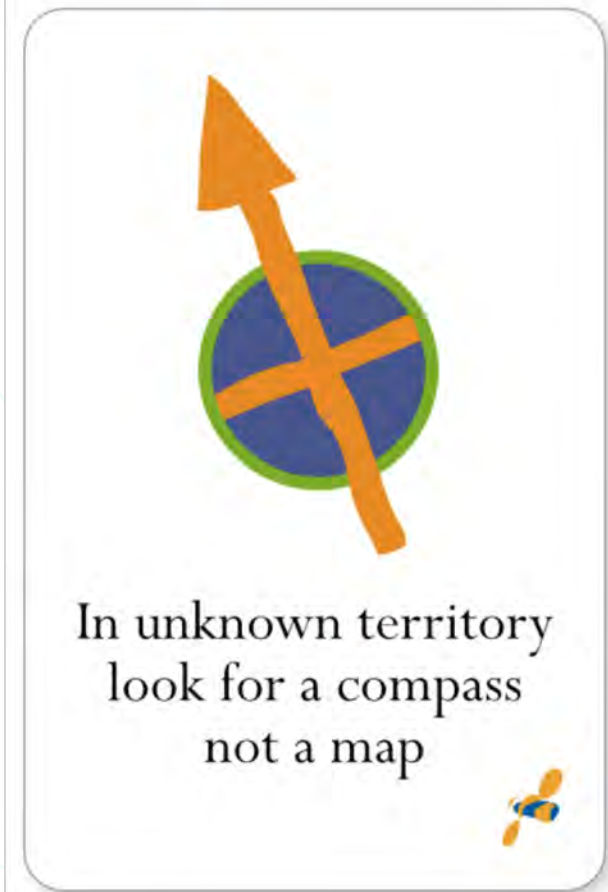
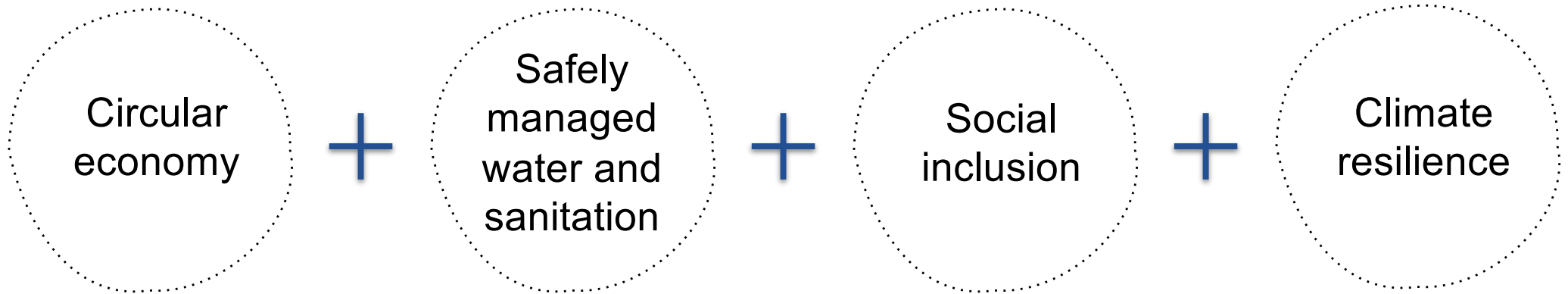


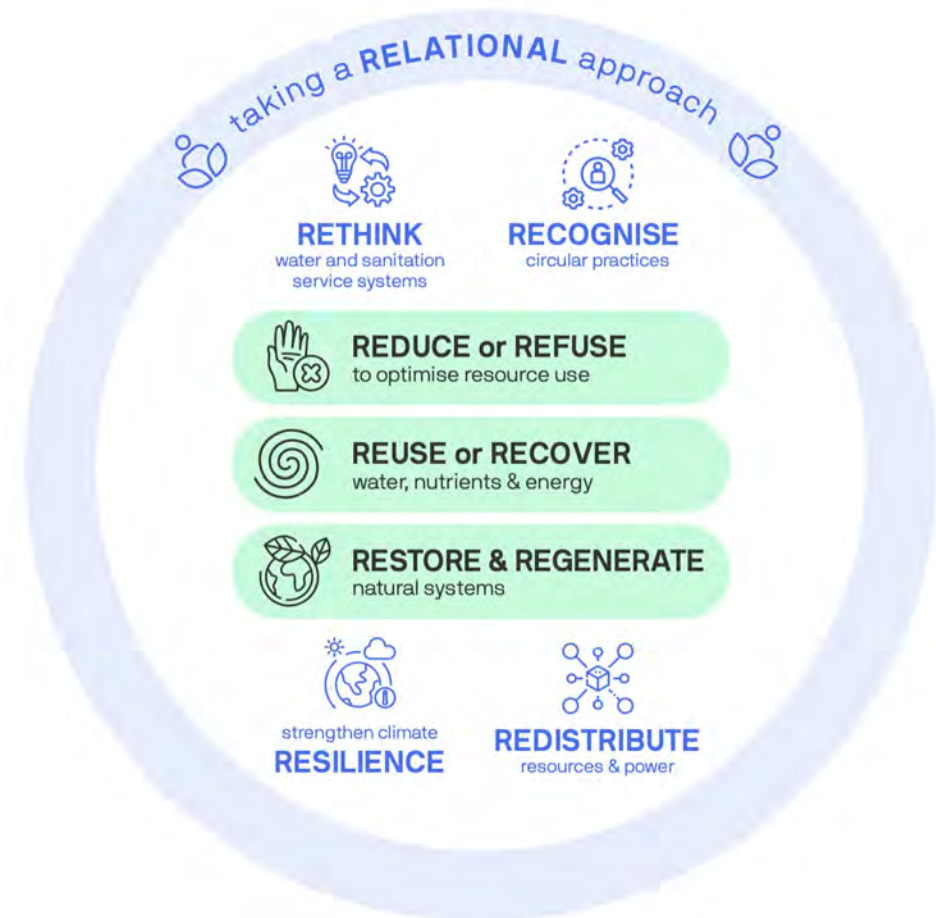
Image: IFF KitBag

Where to start? Systems change must be driven by principles



How can we move from principles to practice? The 8Rs framework

- A theory-based ‘thinking tool’ that everyone can use
- 8 R strategies that reflects the principles
- Supports locally-led application of circular economy strategies



How can we move from principles to practice? The 8Rs framework


Practical strategies



REDUCE or **REFUSE** is about eliminating waste and pollution.




REUSE or **RECOVER** is about circulating products and materials at their highest value.




RESTORE & REGENERATE speaks to the principle of regenerating nature.

Purpose and process




RETHINK water and sanitation service systems



RECOGNISE circular practices



Strengthen climate **RESILIENCE**



REDISTRIBUTE resources and power

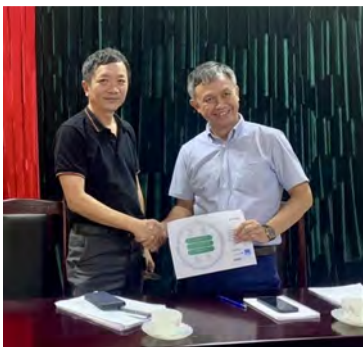


Take a **RELATIONAL** approach

Using the 8Rs framework

What do the 8Rs bring up?

What principles do we need to think about?



Ideation about locally-relevant circular economy opportunities



Investigating promising opportunities



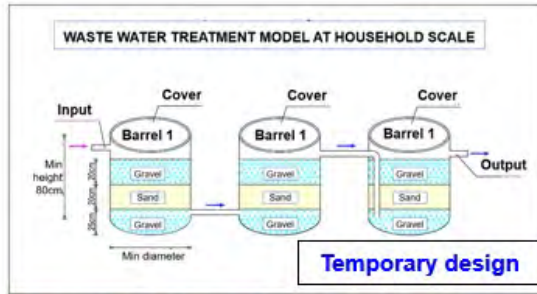
Planning and implementing opportunities



Evaluating activities against circular economy, inclusion and climate resilience principles

Ha Tinh, Viet Nam

Three-tank system for greywater treatment and reuse at household scale



Negative impacts

Overflowing greywater causing pollution in flooding and bad smell in drought time



Positive impacts

Sludge and greywater treated for reusing as fertilizer and watering in gardening

↑
8Rs



New rural development target 2021-2025
Greywater of 35% of HH treated

Examples: UNICEF East Asia Pacific region circular economy activities



NRW (Indonesia, Cambodia)

Reducing energy demand
(Cambodia, Vietnam)

Water conservation in schools and
health care facilities (China)

Supply-chain optimisation (Pacific)

Biodegradable and reusable
menstrual pads (Thailand, Pacific)



Faecal sludge to energy
(Indonesia, China)

Wastewater treatment for reuse
(Mongolia, Vietnam, China)

Exploring plastics recycling for
sanitation (Kiribati)



Restoring and regenerating
catchments (Timor Leste)



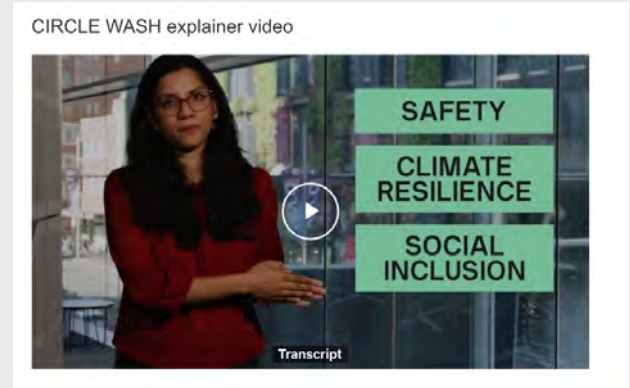
Find out more



Learning brief developed with UNICEF



Journal article The 8Rs framework for circular water and sanitation systems



Project site Explainer video and other outputs

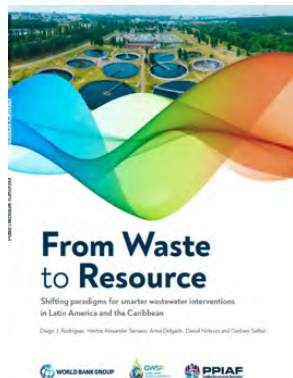


Get in touch Naomi.Carrard@uts.edu.au

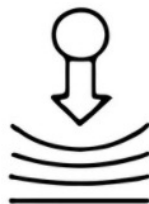
Circular Economy in Water: beyond reuse



To really embrace circular principles, we needed to look beyond wastewater



Entire WATER CYCLE



Include RESILIENCE

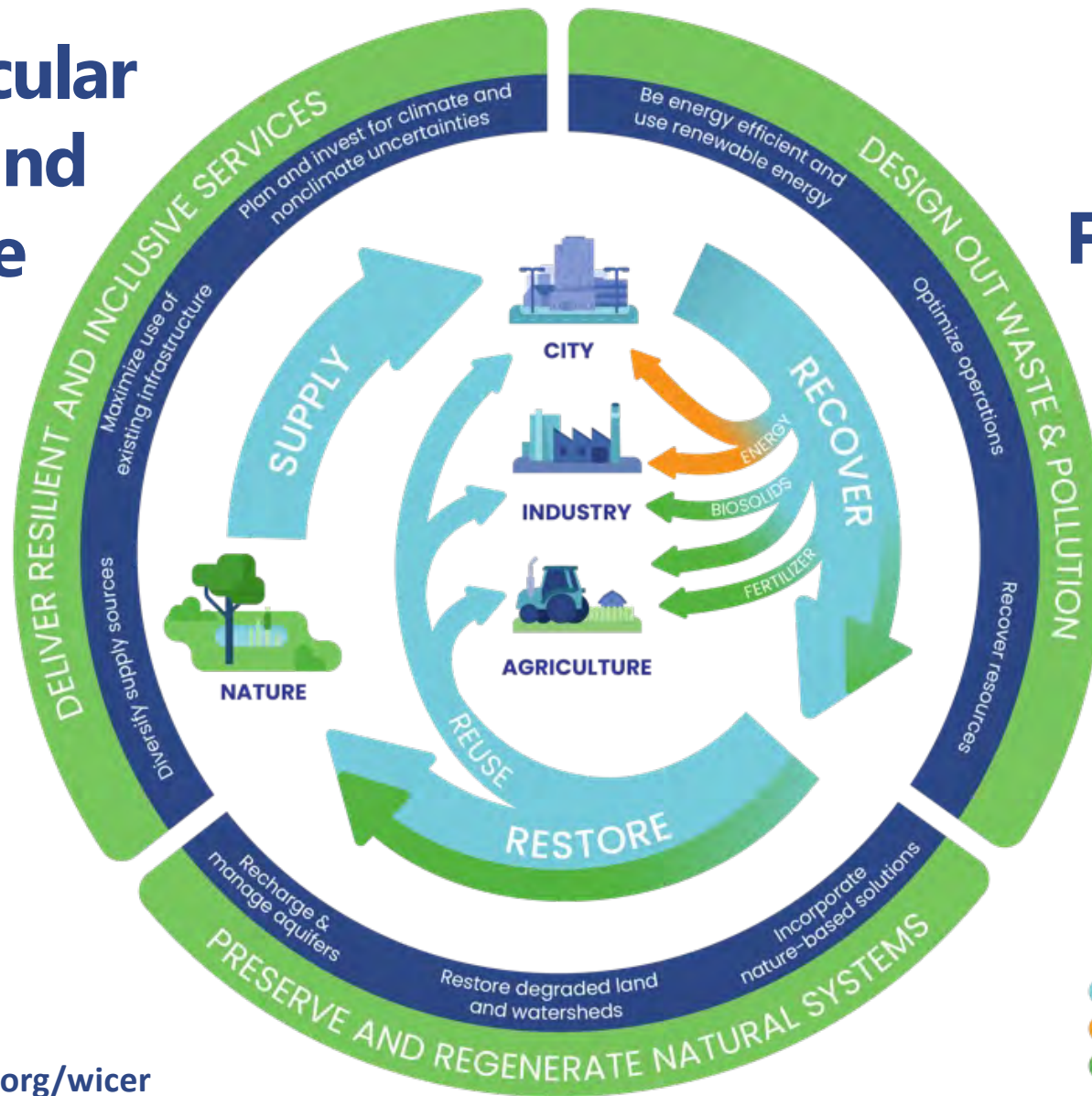


Ensure INCLUSIVENESS



Proactively RESTORING NATURE

Water in Circular Economy and Resilience (WICER)



THE WICER FRAMEWORK



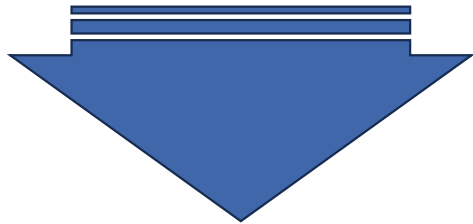
<http://www.worldbank.org/wicer>

Missed Opportunity : from waste to resources



Implementing circular economy principles makes economic and financial sense

- Create additional revenue streams (selling by-products from water)
- Reduce O&M costs (ex: generate energy, lower NRW)
- Offer a better return on investment in a sector heavily subsidized



- Potential to create more innovative business models
- Potential to attract the private sector (PPP)
- Potential to tap into other sector's financing (green/climate bonds, environmental impact bonds, etc)
- Potential to provide universal access in a more sustainable way

Investments in nature-based solutions such as upstream reforestation, can reduce treatment needs and costs



Investments in energy efficiency and reducing NRW can be recovered in less than 3 years

Self-generating renewable energy can reduce energy costs, increase system resiliency and lower GHGs



Utilities can create additional revenue streams to cover O&M costs by selling wastewater byproducts such as clean water and fertilizers

What have we learned?



- [Atotonilco, Mexico](#)
- [Chennai, India](#)
- [Cyprus](#)
- [Durban, South Africa](#)
- [Lingyuan City, China](#)
- [Nagpur, India](#)
- [San Luis Potosi, Mexico](#)
- Other...

1. Stakeholder Engagement Early in the Process to identify end users, design treatment process fit to purpose and ensure social acceptability

2. Clear Regulatory Framework for reuse or/and Clear Roles, Rights, Responsibilities via Contracts between seller and buyer

3. Ensure the financial Viability of investments: Create Additional Revenue Streams for Operators & explore private sector participation

4. Holistic approach to circular economy: Parallel investments in improving the efficiency of operations, nature based solutions, etc



Circularity is not the end goal, but the means to achieve greater outcomes



Sustainability
and
Resilience



Jobs created



Restored
Ecosystems

Universal
access

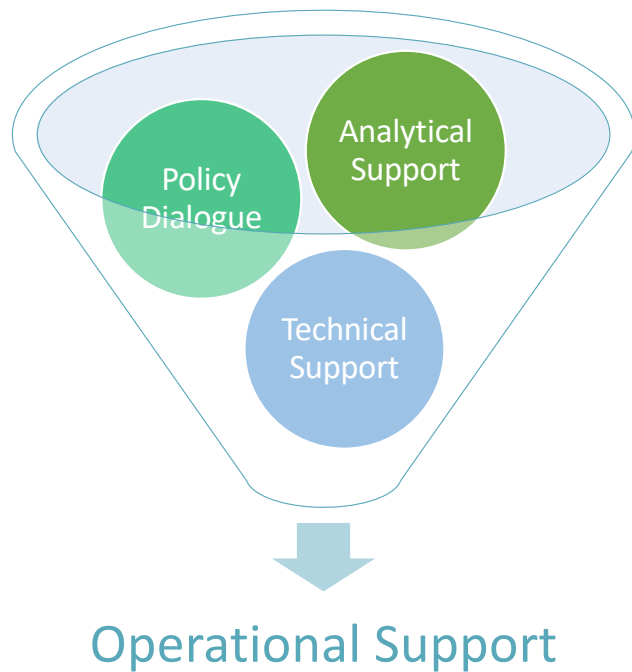


Equity



Urban prosperity

How is the World Bank working with clients to promote a circular approach?



Objective

- Support countries in their policy reforms and investment strategies that prioritize circular economy approaches in the delivery of water services and water management.

By:

- **Providing tailored technical assistance and capacity-building** to support World Bank projects and countries in integrating circular economy principles into their water management strategies and projects.
- **Developing and disseminate educational and training resources**, guidelines, and decision-support tools to help stakeholders assess, plan, and implement circular economy initiatives in their respective contexts.
- **Organizing knowledge-sharing and capacity building events**
- **Actively participating in water forums, conferences, and events** to raise awareness, share insights, and foster dialogue on the importance of circular economy principles in water.
- **Forging partnerships** with governments, international organizations, academia, and industry stakeholders to leverage expertise, resources, and networks in advancing the objectives of the initiative.

To learn more....



Check our new website: www.worldbank.org/circularwater

- MANY RESOURCES:
- + reports
- + case studies
- + guidelines
- + related WB projects
- + training material
- + tools
- + webinars
- + infographics
- +



Water in Circular Economy and Resilience (WICER)



REPORT
Water in the Circular Economy



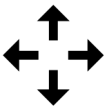
ASSESSMENT TOOL
The WICER Assessment Tool



About the Program
An initiative by the World Bank's Global Water Practice to help embrace and

CIRCLE WASH 8Rs and WICER frameworks

- Beyond wastewater reuse - **holistic approach to circular economy**.
- **Systems change** view of circular economy, with different and complementary language about capturing the full value of water, driving resilience and inclusion, rethinking assumptions.
- WICER offers a guide about **what circularity can look like**. The CIRCLE WASH 8Rs framework is a **tool for exploration**.
- WICER well used in cities, 8Rs framework tested in rural and emerging urban areas. Both potentially **useful for different audiences** depending on what information is needed, and what processes are feasible and desirable.
- Both are continuing to consider how circular economy approaches can strengthen **climate resilience** - making this central to our ongoing work and collaboration.



Roundtable activity and discussion (20 mins)

Exploring tools for leveraging circular economy for water and sanitation

Climate Resilience Pathways: Water Security and WASH in Asia Pacific

circle wash

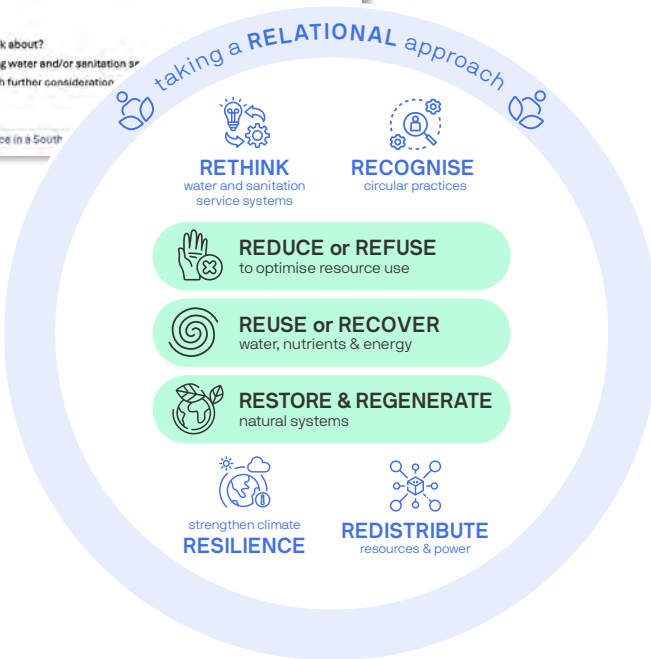
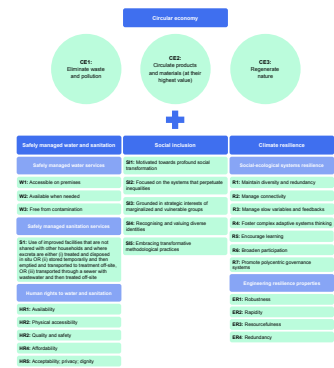
Roundtable discussion: Applying the 8Rs framework to a scenario

Instructions

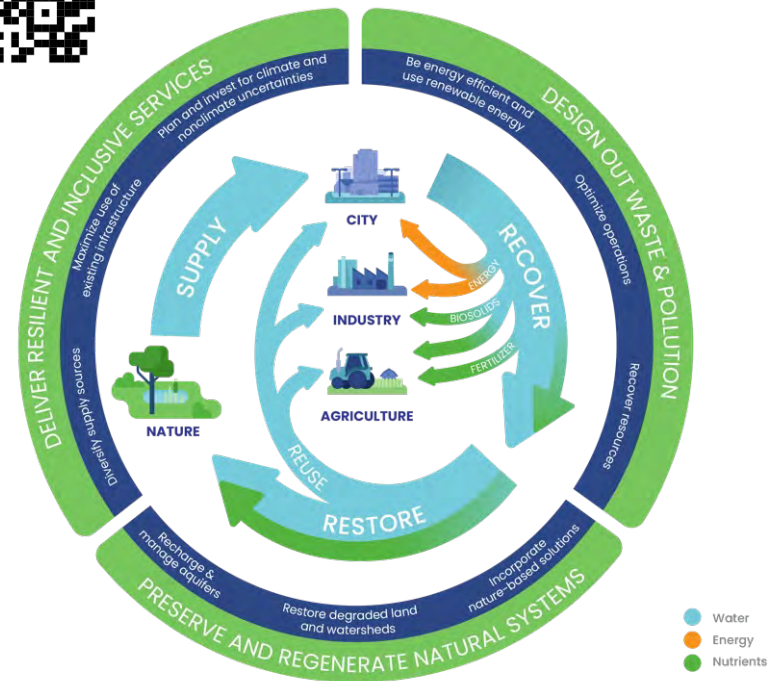
1. Read the scenario description below (5 minutes)
2. Discuss at your table, using the 8Rs framework
 - What do the principles and 8Rs make you think about?
 - What are some implications for strengthening water and/or sanitation sr
 - Identify any opportunities that might be worth further consideration

Refer to the supporting materials for guidance.

Scenario (water/wastewater focussed): A rural province in a South



<https://www.wicer-tool.com>



Circular water and sanitation approaches as a pathway to build climate resilience

Circular water and sanitation approaches as a pathway to build climate resilience

Reflections from research and practice



Đinh Văn Đạo

Institute for Water Resource
Economics and Management



Apolonia Barreto

UNICEF Timor-Leste



Irma Magdalena Setiono

World Bank

Responding remarks

What does it take to pursue circularity, safety, inclusion and climate resilience?



Dr Alison Baker

Water for Women Fund

Reflection from Vietnam – Dr Đinh Văn Đạo

Vietnam Academy for Water Resources, Institute for Water Resource Economics and Management



Reflections from research and practice in Vietnam



Reflection from Timor-Leste – Apolonia Barreto

UNICEF Timor-Leste



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Reflections from research and practice



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What's next?

Talk to the person next to you: what is one idea or action you are taking away from today?

Closing menti

Final words: stay tuned for an online course later in 2025



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