Water in Circular Economy and Resilience (WICER) Framework

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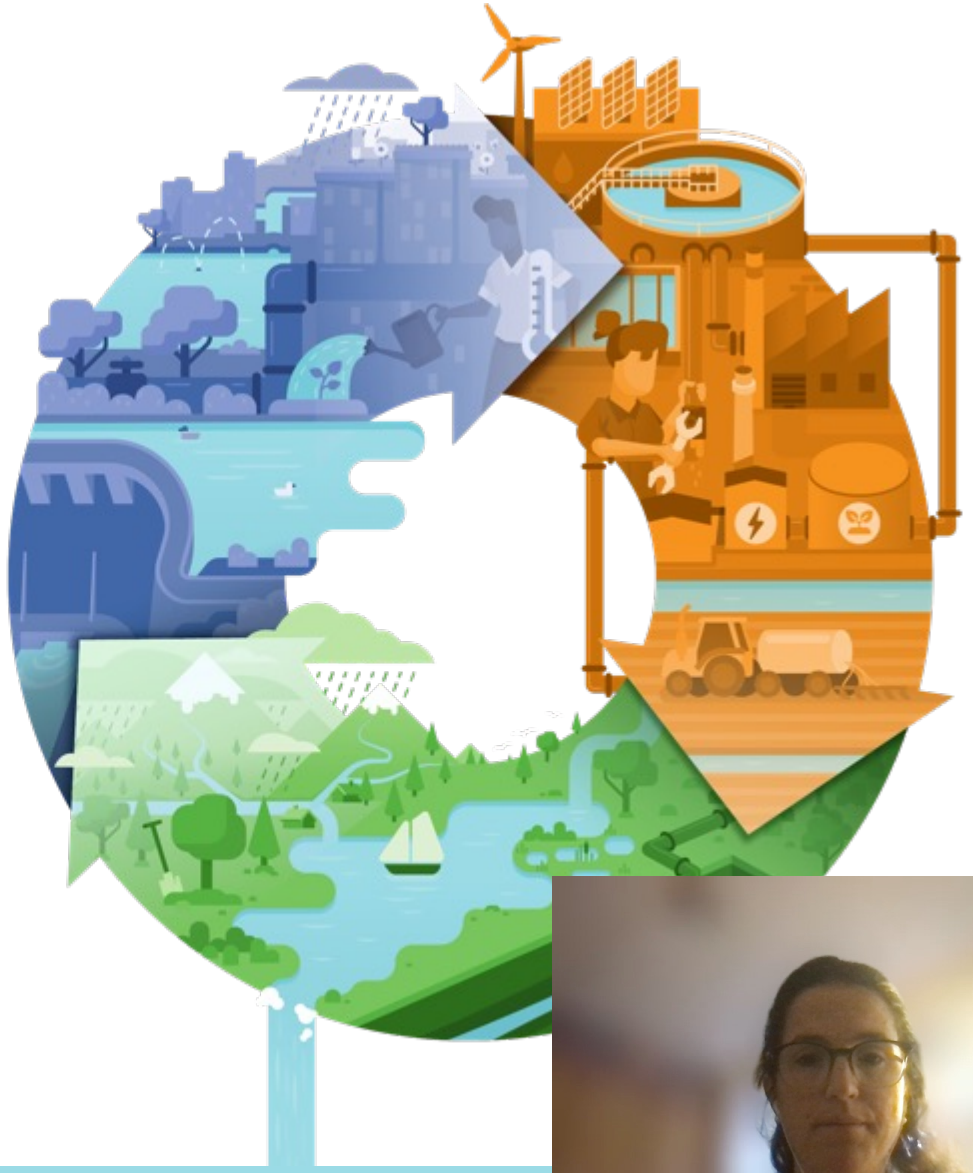

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GWSP
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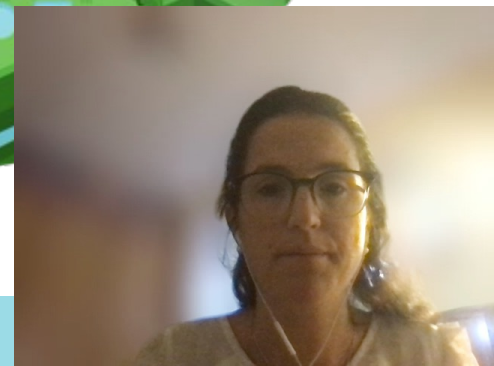


1. Circular Economy – what is it?

2. Water in Circular Economy and Resilience Framework (WICER)

3. WICER Activities in the World Bank

THE CURRENT WATER CRISIS IS ONE OF THE GREATEST CHALLENGES OF OUR TIME

THE CHALLENGE

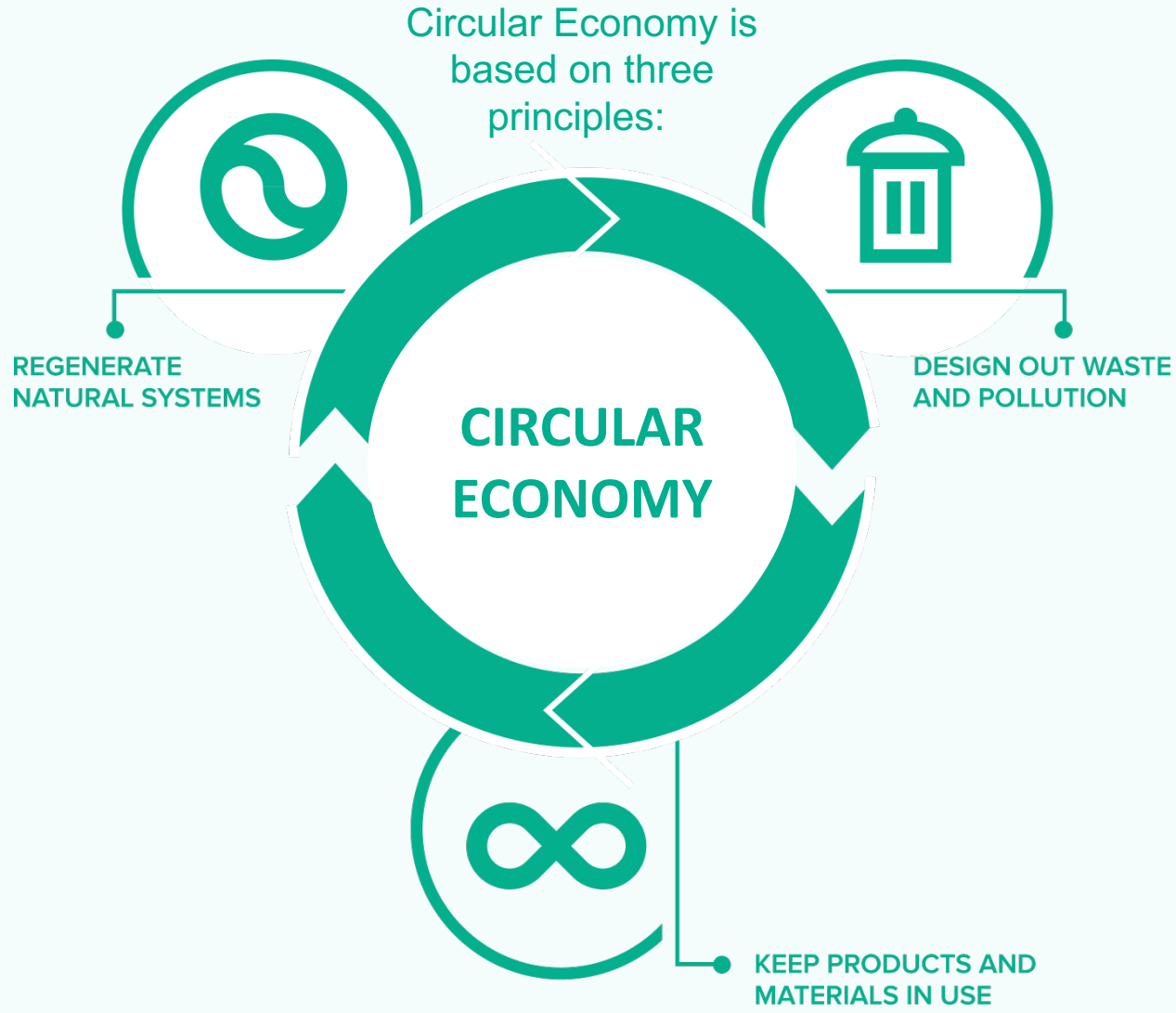
Increasing population, economic growth and shifting consumption patterns have driven a rapid rise in demand for water resources, while 36 percent of the world's population already lives in water-scarce regions.

Water is essential for socioeconomic development and it links with nearly every Sustainable Development Goal. Nevertheless, water is undervalued, and water resources are used inefficiently.

Water pollution resulting from human activities has clear health, socioeconomic and environmental impacts, and further threatens the sustainability of water supplies.

Climate change is challenging the sustainability of water resources, which are already under severe pressure in many regions of the world.

What are the principles of Circular Economy?

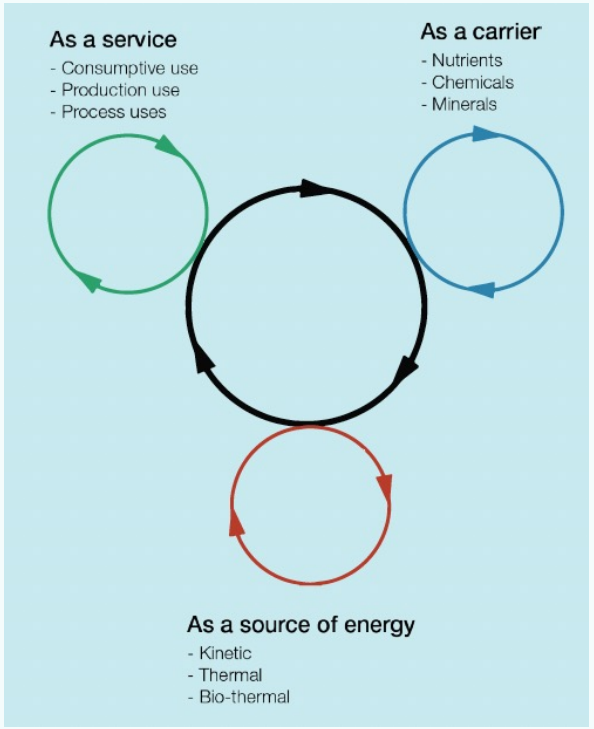


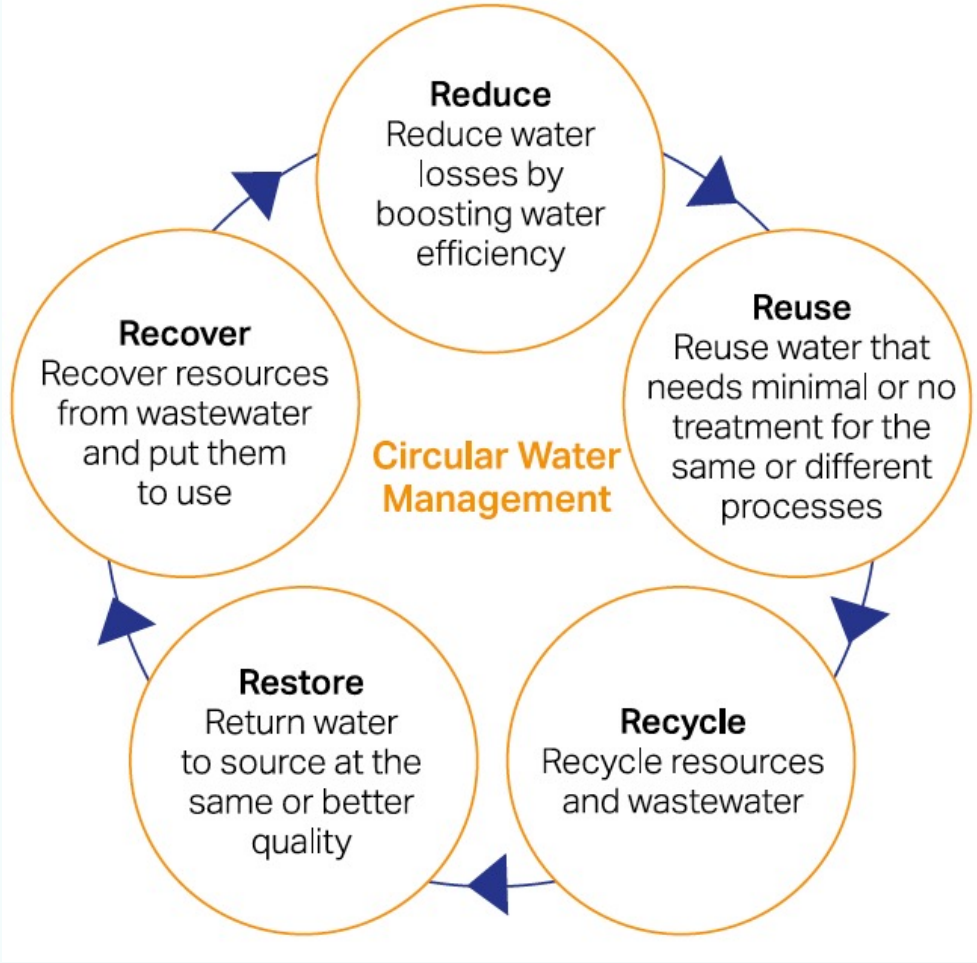
- decoupling economic activity from the consumption of finite resources and from environmental degradation
- replacing the end-of-life concept with restoration
- restoring and regenerating ecosystems by intention and design,
- eliminating waste through superior design—of materials, products, systems, and business models
- not a synonym of recycling (recycling should be the last resort)

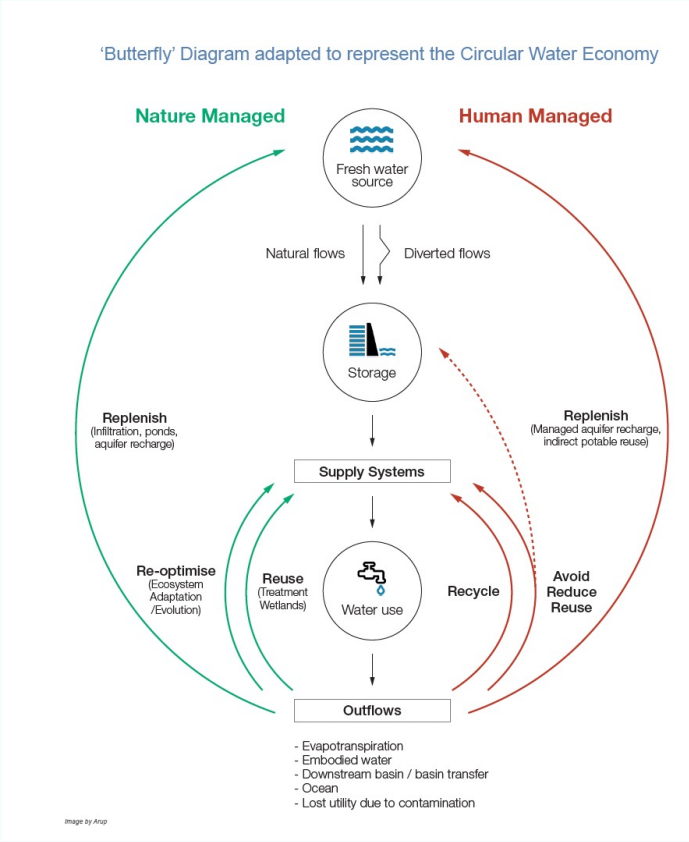
a circular model builds economic, natural, and social capital

Source: Ellen MacArthur Foundation

Circular economy in water







SOURCES

- **International Water Association (IWA), 2016.** "Water Utility Pathways in a Circular Economy." London.
- **World Business Council for Sustainable Development, 2017.** "Business Guide to Circular Water Management: Spotlight on Reduce, Reuse and Recycle." Geneva.
- **Ellen MacArthur Foundation, ARUP, and Antea Group. 2018.** "Water and Circular Economy." White Paper

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Water

Inspired by the circularity of the water cycle in nature…

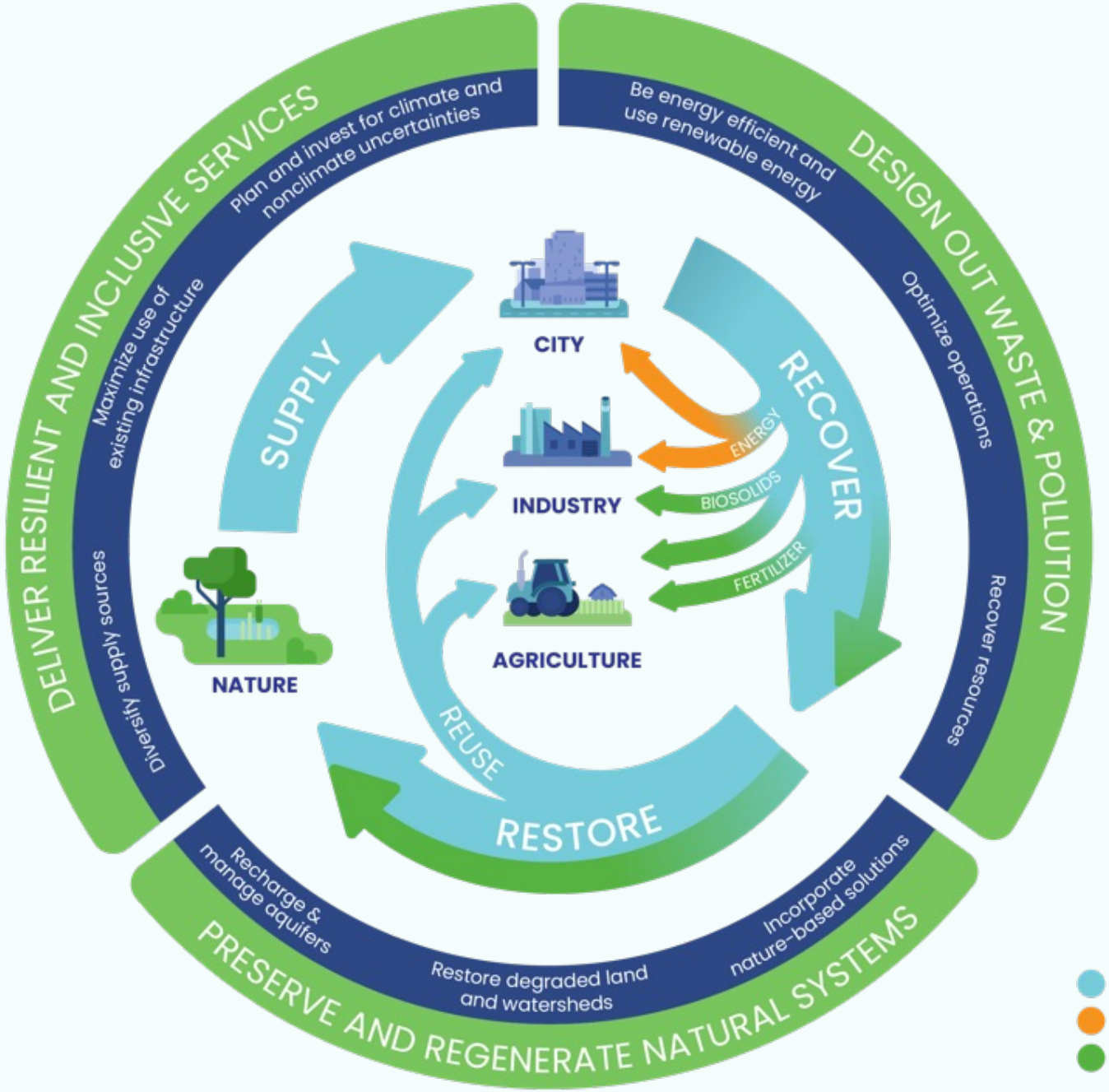
+ resilience

+ inclusitivity

We must shift from…

A LINEAR SYSTEM …

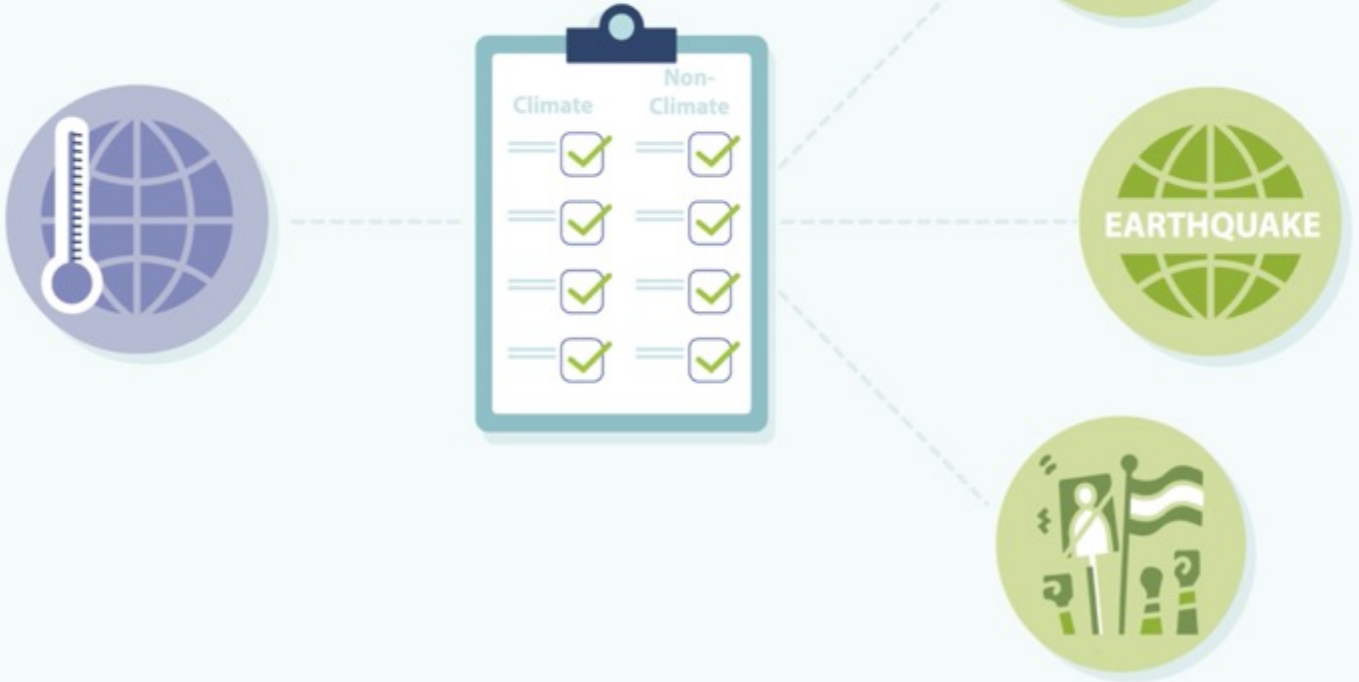
The Water in Circular Economy and Resilience (WICER) FRAMEWORK



http://www.worldbank.org/wicer

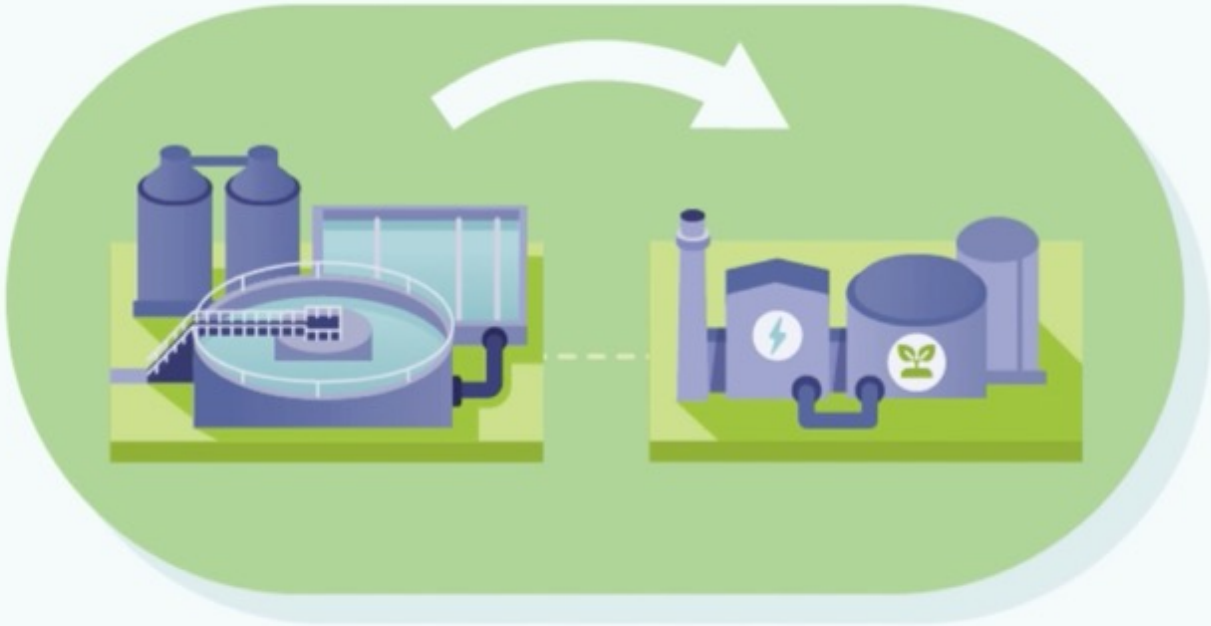
OUTCOME 1: DELIVER RESILIENT AND INCLUSIVE SERVICES

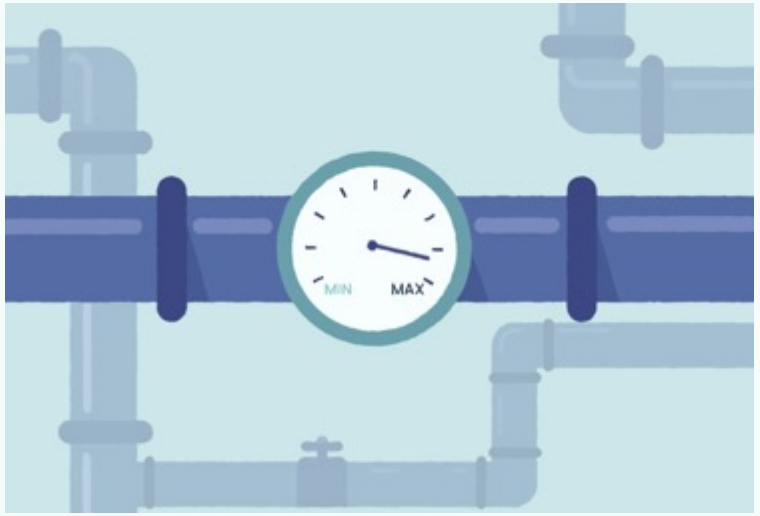
We need to plan and invest for climate and non-climate uncertainties



OUTCOME 1: DELIVER RESILIENT AND INCLUSIVE SERVICES

Maximize the use of existing infrastructure





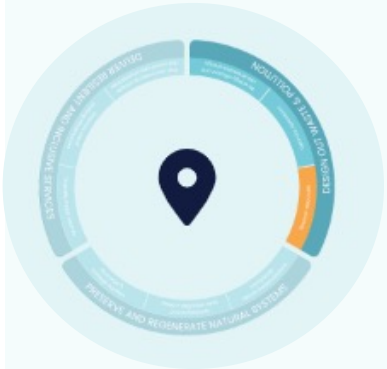
OUTCOME 1: DELIVER RESILIENT AND INCLUSIVE SERVICES

Diversify water supply sources

- Diversification of water supply sources (water balance)
  - including sources with different risk and cost profiles, and low vulnerabilities
- Protecting those water supply sources
- Including integrated water storage

OUTCOME 2: DESIGN OUT WASTE AND POLLUTION

Recover resources from water and wastewater



OUTCOME 2: DESIGN OUT WASTE AND POLLUTION

Water

Industrial processes (paper, textile, etc.)

Irrigation (agriculture, parks, etc.)

Replenish aquifers

Recreational use

Cooling water (power plants)

Indirect potable water

beer with reclaimed water

biogas

phosphate fertilizer

bricks

cellulose

Biofuels (algae)

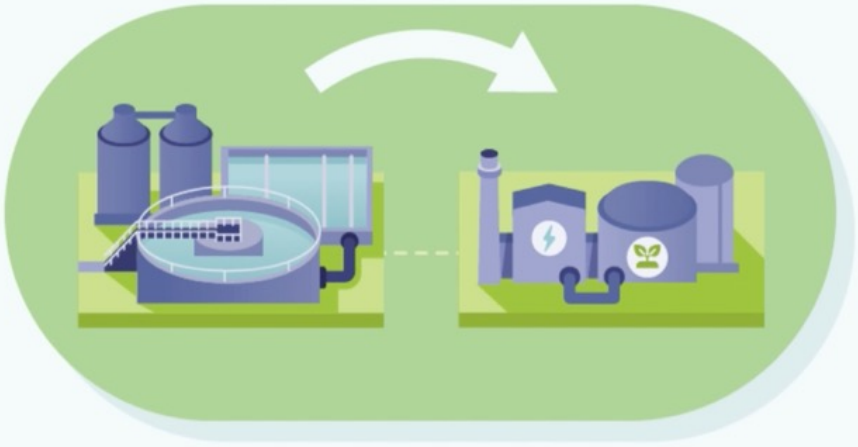
OUTCOME 2: DESIGN OUT WASTE AND POLLUTION

Optimize operations

- Reduce NRW
- Increase overall efficiency of processes
- Optimize the amount of energy, minerals, and chemicals used in the operation of water systems

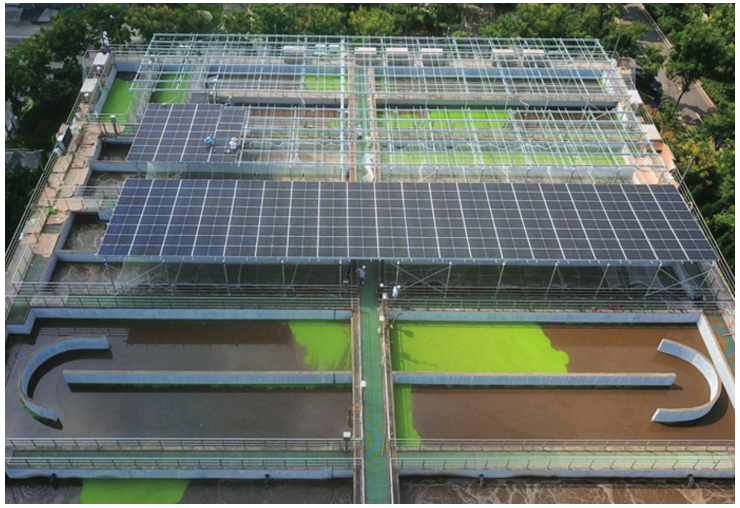
OUTCOME 2: DESIGN OUT WASTE AND POLLUTION

Be energy efficient and use renewable energy



OUTCOME 2: DESIGN OUT WASTE AND POLLUTION

Solar panels in roof of Recycled Water Treatment Plant
Tuncurry, Australia



Solar panels in WWTP
Lianyungang, China

Floating Solar panels in WWTP
Kraaifontein, South Africa

Image: University of Cape Town (UCT)

OUTCOME 3: PRESERVE & REGENERATE NATURAL SYSTEMS

- Restore degraded land and watersheds
- Manage and recharge groundwater
- Incorporate nature-based solution

OUTCOME 3: PRESERVE AND REGENERATE NATURAL SYSTEMS

Sponge cities

Upstream reforestation

Constructed wetlands as part of the wastewater treatment

Fotos: Jose Luis Valverde

Recover degraded watersheds and land

Green roofs

CROSS-CUTTING ISSUES

- Manage water demand
- Leverage the power of digitalization
- Create the right Policy, Institutional and Regulatory (PIR) environment
- Ensure solutions are inclusive

Implementing circular economy principles also makes economic and financial sense

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

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

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

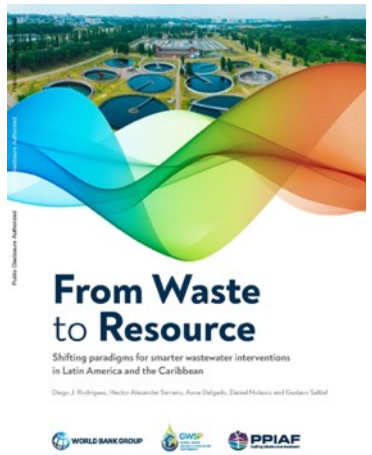
Utilities are creating additional revenue streams to cover O&M costs

WICER in practice – How is the World Bank working with clients to promote a WICER approach?

Documenting relevant case studies

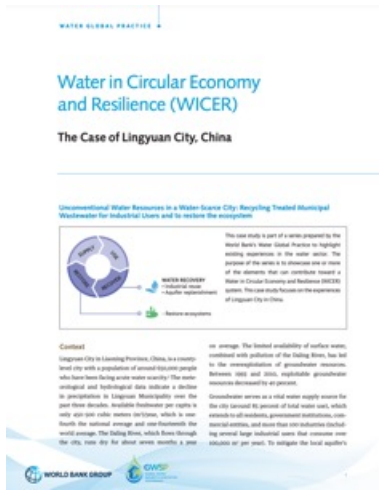
WICER

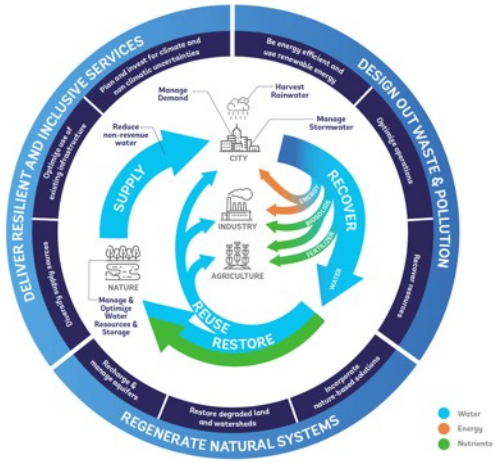
www.worldbank.org/wicer



Waste to Resource

www.worldbank.org/wastetoresource





Policy dialogue

Review of existing regulatory frameworks in Middle East and North Africa Region (wastewater reuse and desalination)

Dialogue on regulating reuse and circular economy in Colombia & Turkey

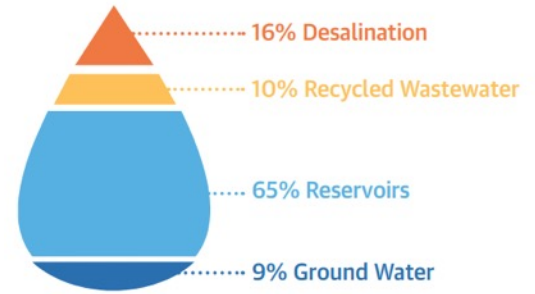
Advice to Senegal on revision of Water and Sanitation Codes

Support to Bolivia's National Strategy for Wastewater Management and Reuse

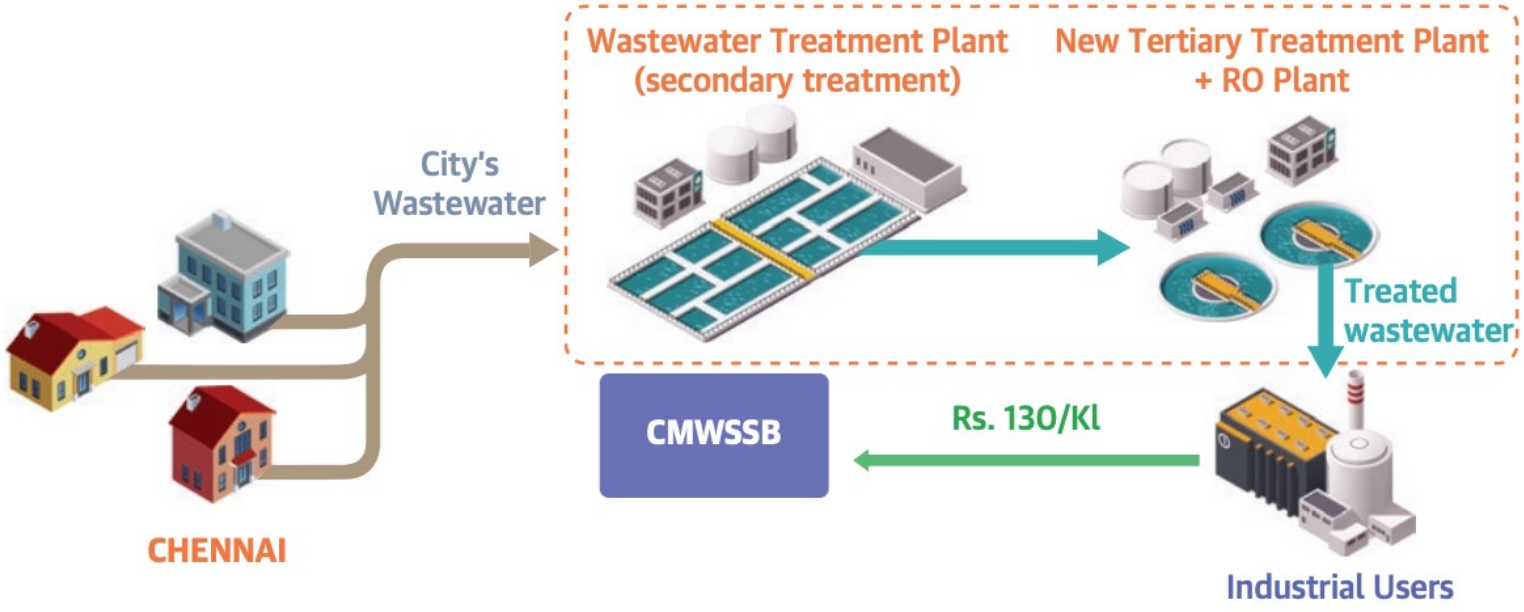

Targeted project activities and investments

Applying circular economy principles in Chennai, India

Tamil Nadu Sustainable Urban Development Project



Source: CMWSSB, 2020.



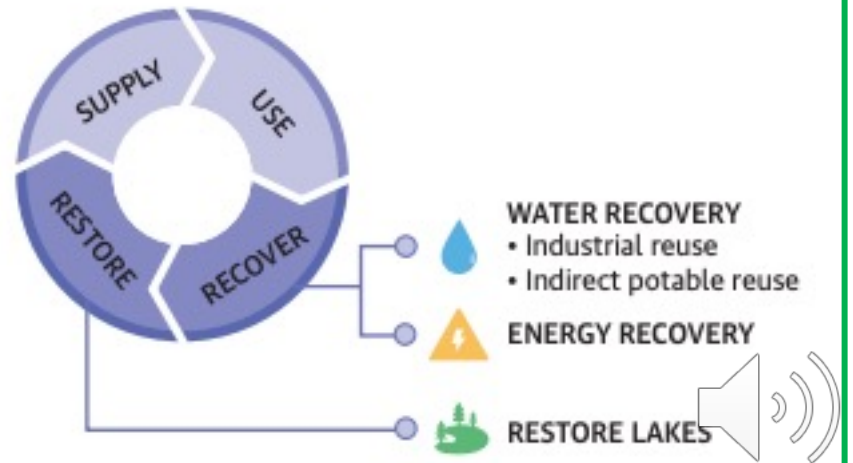
Notes: CMWSSB = Chennai Metropolitan Water Supply and Sewerage Board; RO = reverse osmosis.

http://www.worldbank.org/wicer

Benefits:

- Sold treated wastewater covers O&M for municipality
- Lower operating costs and decreased risks of water scarcity for industrial users

CIRCULAR ECONOMY ELEMENTS



Other World Bank projects with circular economy components:

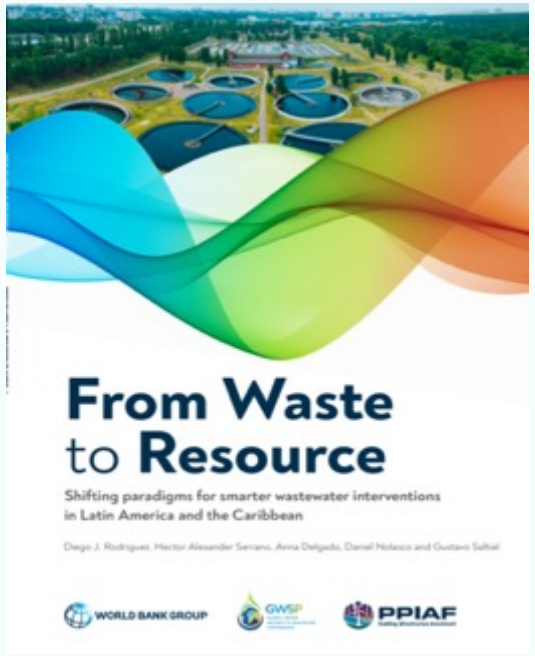
- China: Liaoning Coastal Economic Zone Urban Infrastructure and Environmental Management Project - reuse for industry and environmental restoration
- Uruguay: Uruguay OSE Sustainable and Efficient Project - Improving Resiliency, Sustainability and Efficiency in Uruguay´s National Water Supply and Sanitation Company
- Brazil: The Watershed Management and Restoration of Forest Cover project - Targeted green infrastructure for source-water protection
- Senegal: Water Security and Sanitation Project - recovering resources from wastewater and fecal sludge (biosolids, water and energy)
- and others...

Development of a quick assessment tool: is your project WICER?

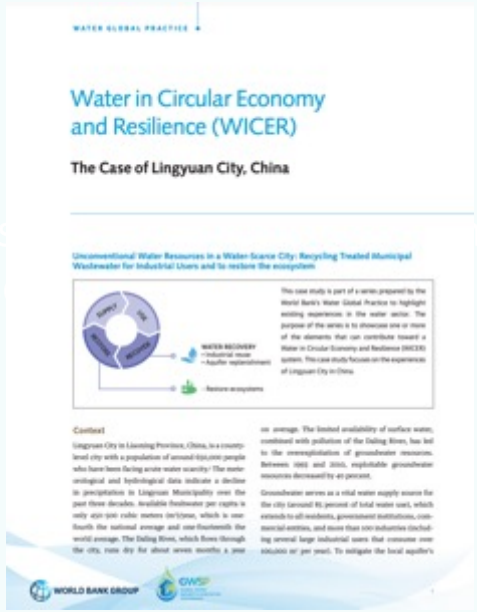
www.wicer-tool.com

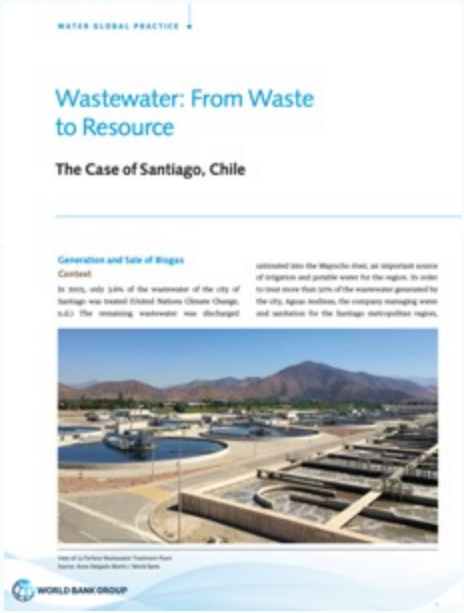
To learn more:

Reports with examples and guidelines to implement the concepts in the water sector



Several case Studies





www.worldbank.org/wicer

www.worldbank.org/wastetoresource

Thank you!

Get in touch:

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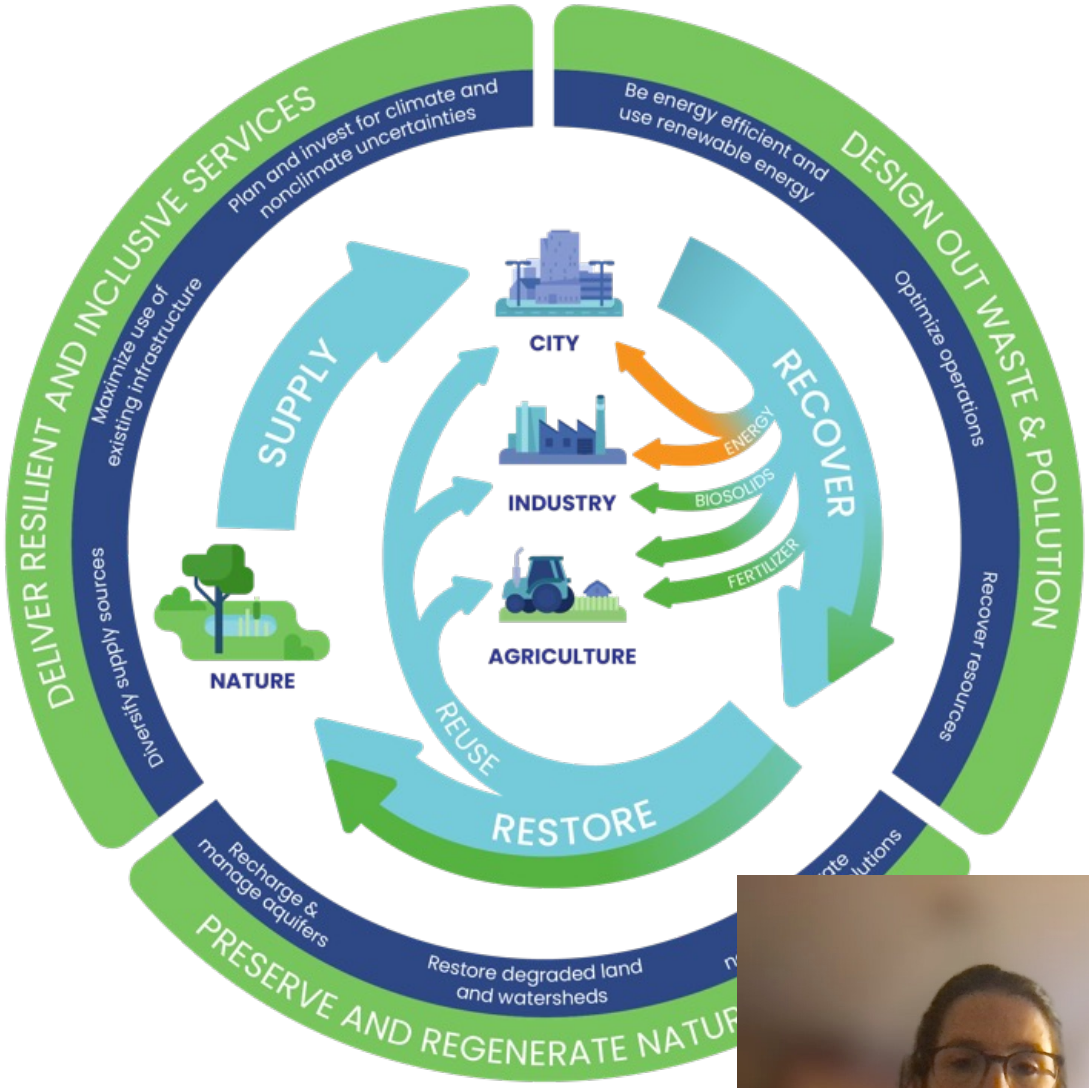

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