ICLEI
Local Governments for Sustainability

Empowering cities and communities through circular water solutions: Global examples

Emani Kumar
Deputy Secretary General, ICLEI
Executive Director, ICLEI South Asia

Contents

- Circular water management
- Role of cities in Circular Water Management
- Circular City Actions Framework
- Case examples

ICLEI's Mission

ICLEI – Local Governments for Sustainability (known as "ICLEI") is a global network working with more than 2,500 local and regional governments committed to sustainable urban development. Active in 125+ countries, we influence sustainability policy and drive local action for low emission, nature-based, equitable, resilient and circular development.

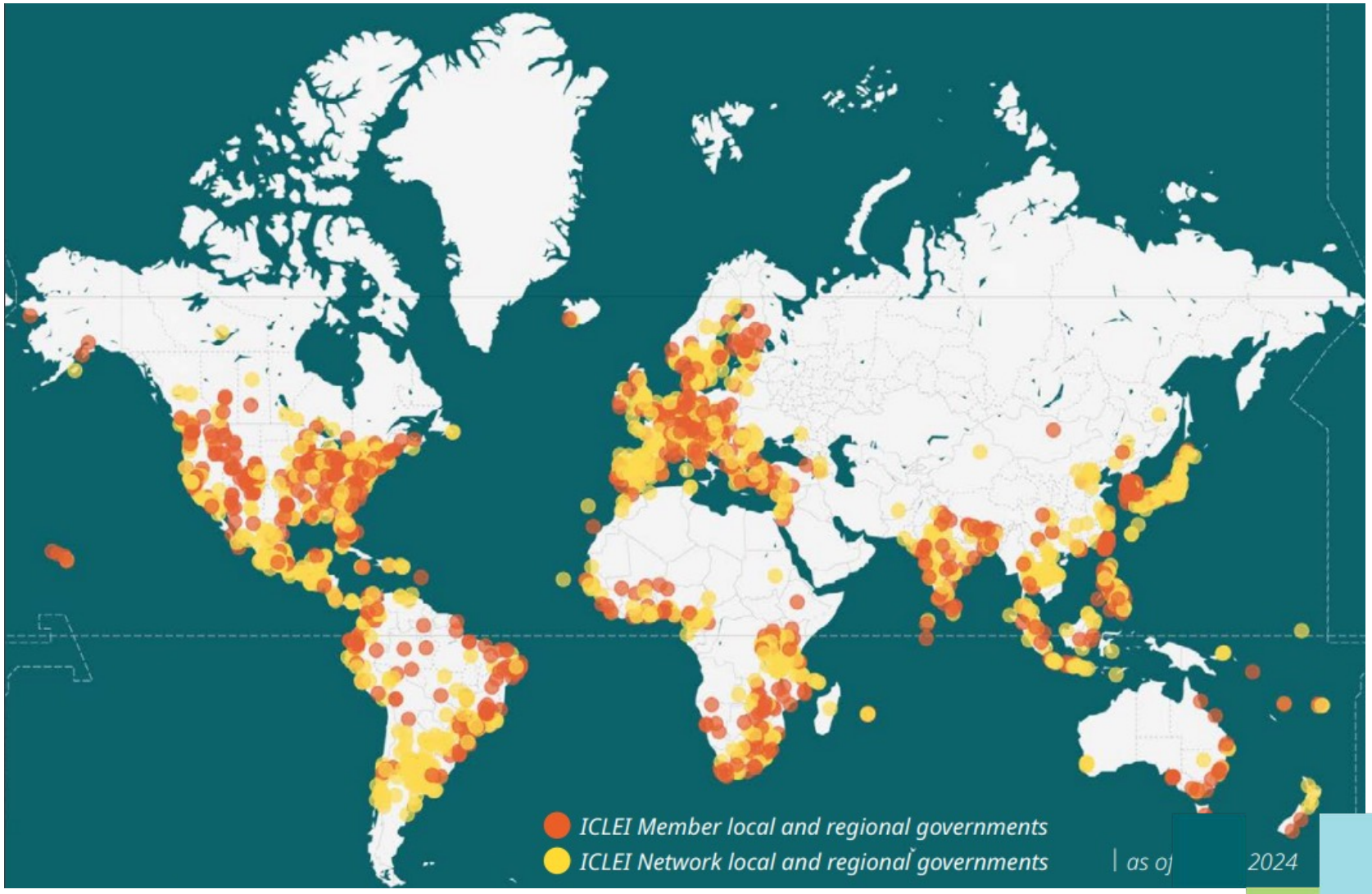
RUNNING 250+ ACTIVITIES ANNUALLY

ACTIVE IN 125+ COUNTRIES

500+ EXPERTS IN 27 OFFICES WORLDWIDE

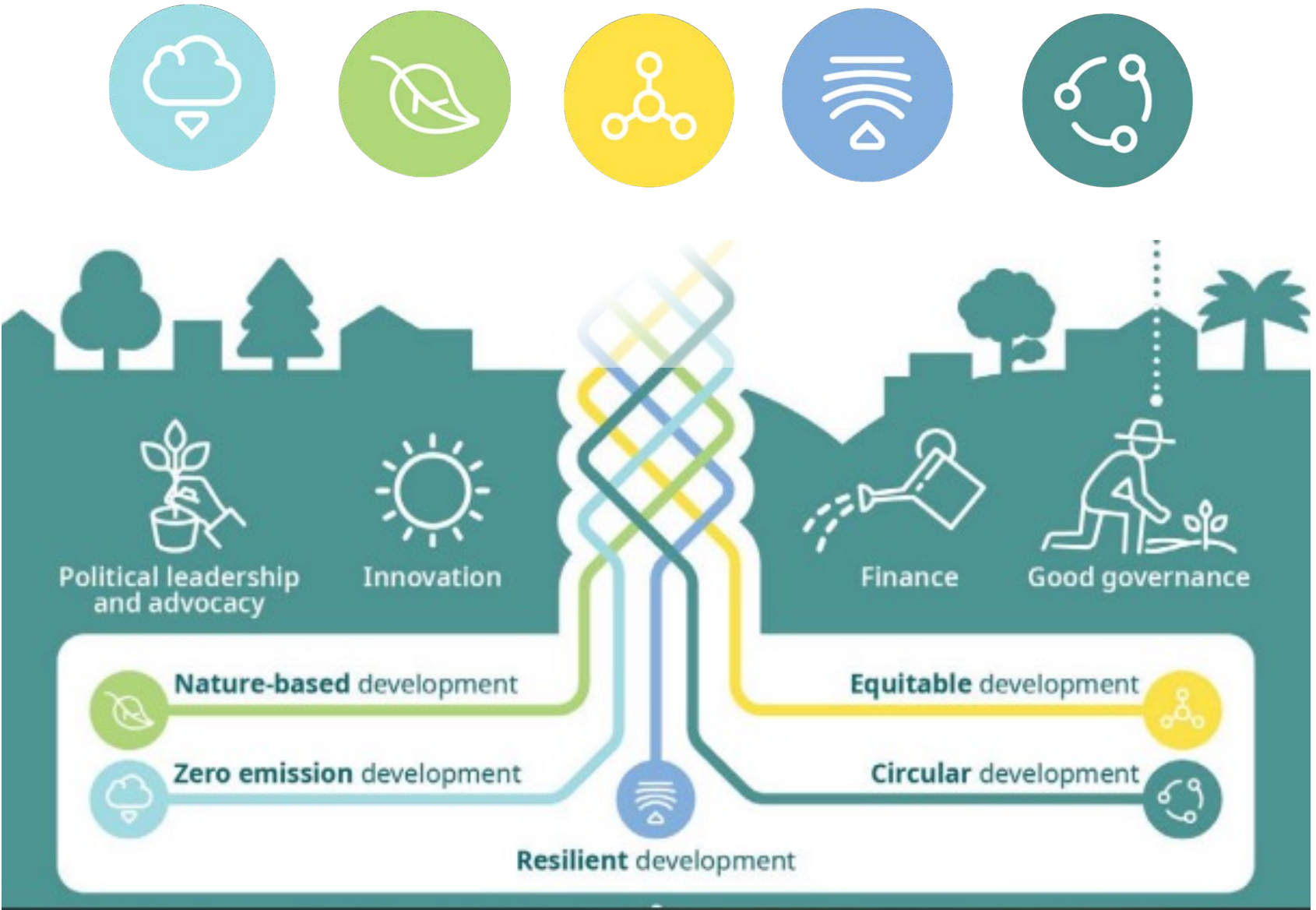
The ICLEI Network of Local and Regional Governments Committed to Sustainability

ICLEI
Local Governments for Sustainability



2,500+ LOCAL AND REGIONAL GOVERNMENTS

How We Work: The Five ICLEI Pathways

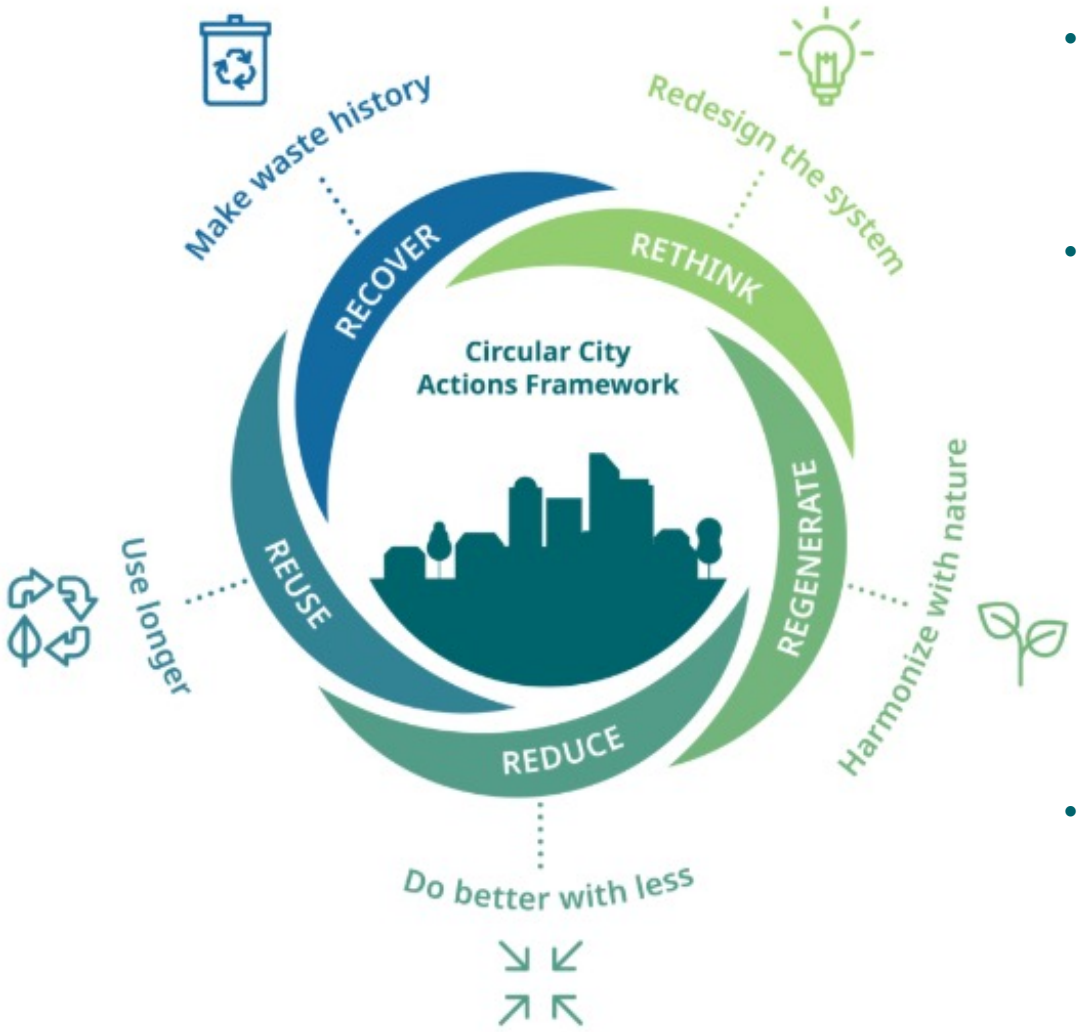


As a compass to shape and manage our actions in a rapidly changing world and to transform our cities, towns and regions, we will drive action through five critical, strategic and interlinked pathways that are the basis of sustainable urban development.

Circular water management

- An approach that promotes the efficient use, recycling, and regeneration of water resources to create a sustainable urban water cycle.
- Benefits include
  - Enhancing water security – reusing/recycling water reduces stress on fresh water, increases long term water availability and water security; more affordable water supply
  - Reducing water pollution – diversion of waste water from being discharged untreated helps to reduce pollution.
  - Enhancing climate resilience – capture of rain water, recharge systems replenish ground water and reduce flooding
  - Lowering energy and infrastructure costs – lower costs of new infrastructure to meet increasing water demands; lower costs of transport from far-off places.
  - Promotes sustainable urban development – recycling, reuse of water, recharge of ground water, capture of rain water – green infrastructure can support natural cycles and promote sustainable development in cities; green jobs

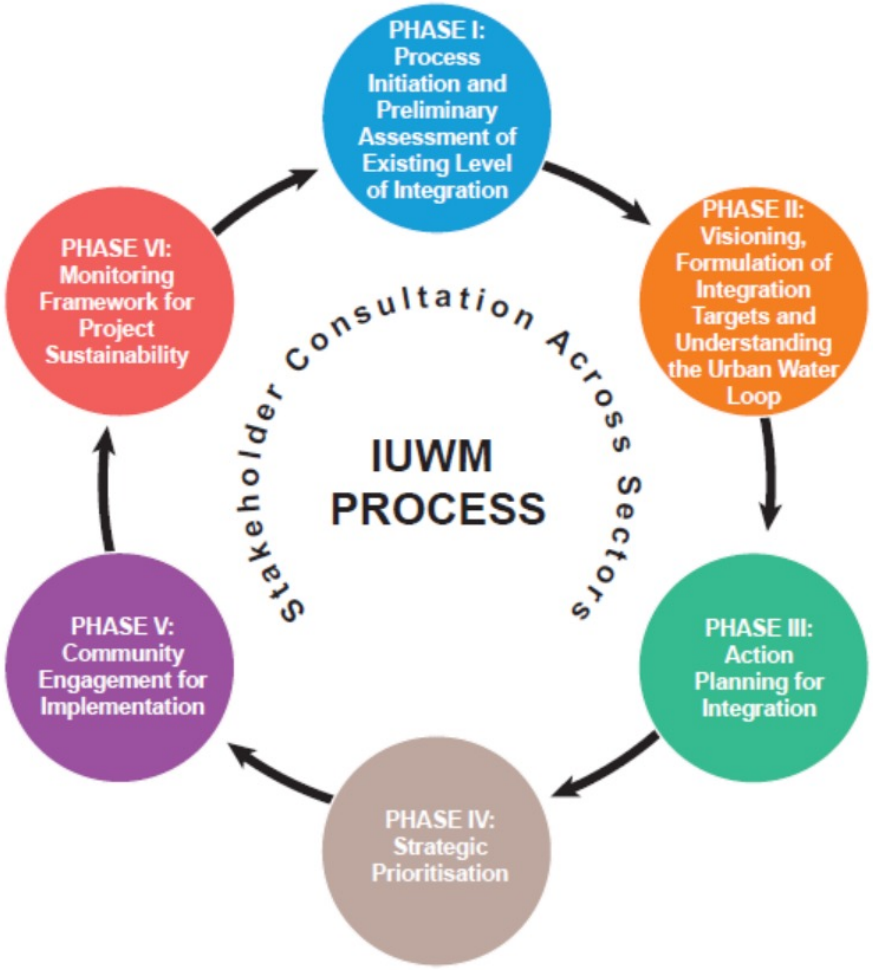
Circular City Actions Framework



- ICLEI developed the Circular City Actions Framework - an action-based framework that provides urban changemakers with 5 complementary strategies
- These strategies address different roles that local and regional governments play-
  - Public service delivery
  - Cooperation with local stakeholders
  - Asset management
  - Urban planning
  - Regulation
- Can be applied to all production, consumption and waste management processes influenced by the city

Role of cities in circular water management

- Municipalities play a critical role in managing water, waste water, storm water, and solid waste.
- Integrated urban water management (IUWM) is a concept
  - Integration of urban water subsystems - water supply, wastewater, solid waste and stormwater
  - Meets urban and peri-urban water demands – addresses climate complexity
  - Considers residential, agricultural, industrial and ecosystem uses of water
- Holistic approach - technical, social, economic, institutional and environmental interests.
- Addresses water management holistically going beyond administrative boundaries - action at multiple scales, with multiple stakeholders.
- Requires cooperation and collaboration among rural and urban users, industry, governmental agencies at different levels, private sector and others.



RETHINK: Redesign systems to lay the foundation for circular activities and enable the transition to a circular economy

Constructed Wetland system in Solapur, Maharastra

- To reduce pollution of Ekhrukh Lake and protect a local drinking water source

Hammarby, a demonstration of closed-loop metabolism concepts in Stockholm: Water, Energy, Transport synergy

- The district is heated by purified waste water, combustion of household waste and biofuel
- Once heat has been extracted from waste water, it is used for cooling
- The biogas produced is used to run local transport

Regenerate: Harmonize with nature by promoting infrastructure, production systems and sourcing that allows natural ecosystems to thrive

- Chettikulam lake restoration in Thiruchirappalli: Lake restoration to augment ground water, prevent upstream and downstream flooding, catering to a community of 35000+ persons
- Rejuvenation of a defunct irrigation canal to protect downstream agriculture and communities
- Closing the loop: Koraiyar river for water extraction and runoff management

Sponge city Shenzhen, China

- Uses nature-inspired water management solutions, including small swales to catch runoff, ponds with native rushes and permeable pavement, to capture, store and purify rainwater
- Reduces the risk of flooding; provides habitat for urban biodiversity

Reduce: Do better with less by using and supporting infrastructure, processes and products that are designed to minimize life cycle material, water and energy use and waste generation

Water management in Kurseong and Darjeeling Tea Estates:

- Harvested rainwater used for domestic use in Kurseong and Darjeeling tea estate communities

Rainwater put to good use in Guelph, Canada

- Limited reservoir of groundwater
- An integrated rainwater-harvesting and rinse-water-reclamation system to reduce water consumption and detergent requirements at the Guelph Transit facility
- Saved over 1 million liters of drinking-quality water and led to municipal cost savings

Reuse: Use longer and more often by extending and intensifying use of existing resources, products, spaces and infrastructure

Reuse of Treated Wastewater in Nagpur, Navi Mumbai...

- 45 MLD (million-litres a day) of tertiary treated urban recycled sewer water is applied for industrial use in Navi Mumbai, thus saving precious drinking water
- Nagpur supplies treated wastewater to Mahagenco

Durban, reducing water stress by reusing wastewater

- 98% of the water produced by the eThekwini wastewater treatment plant recycled.
- 47,500 m3 of wastewater treated daily (equivalent to 15 Olympic swimming pools) is used by local industries in their production processes.

Recover: Eliminate waste by maximizing the recovery of resources at the end of the use phase so that they can be reintroduced into production processes

Anaerobic digestor in Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB)

- Energy recovery in wastewater treatment plants is a common feature
- CMWSSB utilises Anaerobic digestion of sewage sludge, from WWTP to generating biogas converted to electricity
- Reduces reliance on grid power for their operations.
- There are several other plants in India adopt this technology

- Saving money and energy thanks to biogas in Gresham, USA
- The largest energy guzzler turns energy+
- By recovering sewage sludge as gas, it now produces 92% of the power it needs and has reduced its monthly electricity bills by $40,000 to $50,000.
- In March 2023, the Gresham facility had its first “net zero month”

Thank you

Reach out @

Emani Kumar

Deputy Secretary General, ICLEI ● Executive Director, ICLEI South Asia

Email emani.kumar@iclei.org / emani.kumar-dsg@iclei.org