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Circularity in Water Sector Governance

Capacity Building Workshop on CE in Agriculture & Water

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IWMI – MENA regional office

Innovative water solutions for sustainable development

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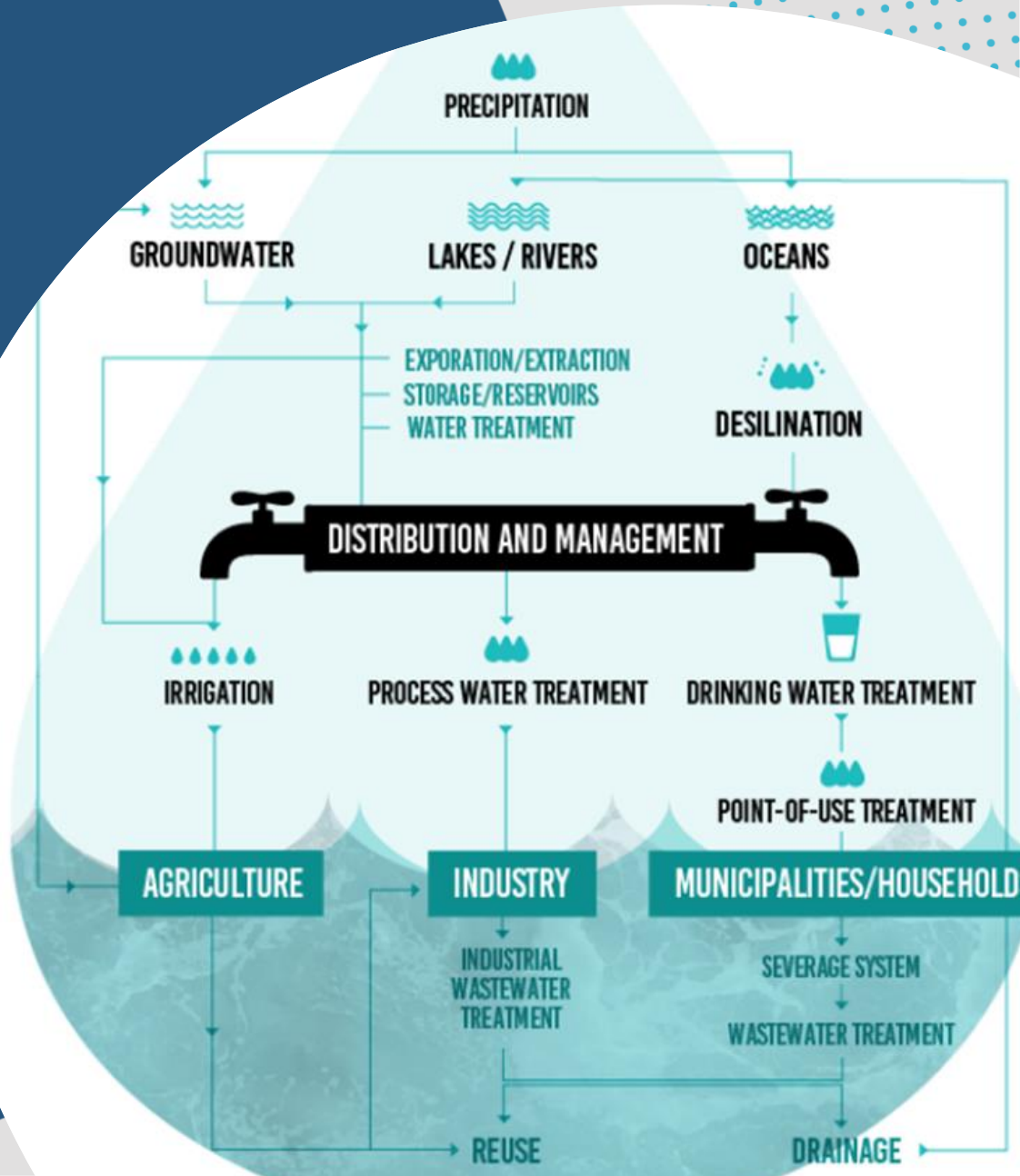


Circularity in Water Governance

Circularity must be adopted at the various stages of the value chain of water resources management.

Two main aspects will be covered:

-Water use efficiency (from source to use)

-Water reuse

Cross-cutting throughout the water value chain, there are elements to achieve Circularity:

-Energy use efficiency

-Renewable energy

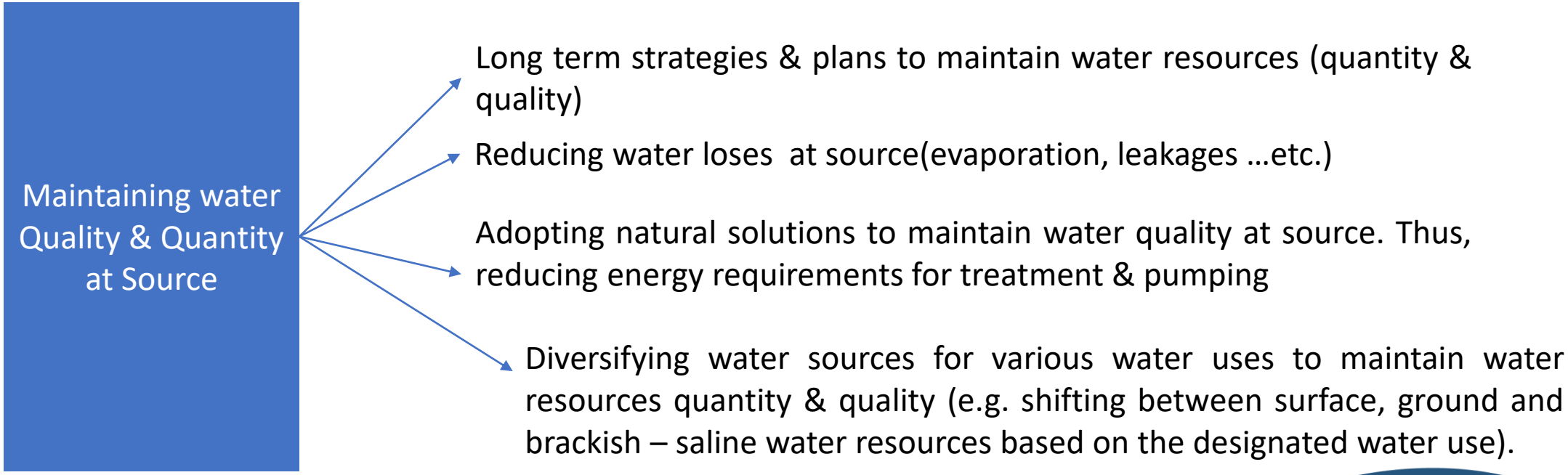
-Infrastructure performance optimization

-Water productivity enhancement

Source: https://www.focusingfuture.com/eco-city/re-creating-the-essential-the-future-of-water/

Water Use Efficiency – Water Source

-Maintaining water resources *quantity* and *quality* at **source**.



Water Use Efficiency - Allocation & Distribution

-Reducing water loses during water conveyance / transfer for domestic and agricultural sectors.

-Non-Revenue Water (NRW) is an essential indicator to measure the level of water loses from the network, also it is an important indicator that reflects energy use efficiency.

-Agriculture water management (AWM) is another area where water loses during conveyance / allocation of irrigation water quotas can be reduced through leakages reduction (e.g., canal lining), policy measures (metering), technological innovation (RS)…etc.

-Capacity building, community involvement (through WUAs) is critical in preventing illegal water abstraction from source, conveyance pipelines…etc.

Water Use Efficiency - Reallocation

-Water resources re-allocation / swapping is another strategy to improve water use efficiency.

-Freshwater resources are often allocated to “high value” uses on top of which is drinking water supply.

-While “lower” quality water resources can be re-allocated to safe use for other purposes such as agriculture and industry uses.

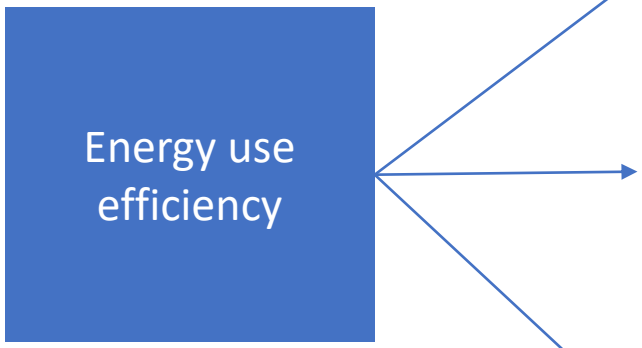
Water Use Efficiency – Hydraulic Infrastructure

Energy use efficiency throughout the water resources management value chain is a governance aspect which is determined by several factors:

-Urban/rural infrastructure planning, design and development

-Asset management (enhancing the efficiency of hydraulic infrastructure)

-Digital transformation



Vertical and horizontal development of urban and agricultural infrastructure is key determinant for the energy consumption & use efficiency

Asset management (and predictive asset management) will ensure energy use efficiency at critical hydraulic infrastructure such as pump stations and water storage facilities.

Digital transformation (e.g., predictive asset management; AI support in determining potential failure in the water distribution system, precision agriculture…etc.) helps in enhancing energy use efficiency.

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Renewable Energy

Shifting towards renewable energy throughout the water use value chain become a must – to do paradigm shift considering the vulnerability of conventional energy sources and the increasing cost of energy used in water pumping, treatment and distribution / allocation.

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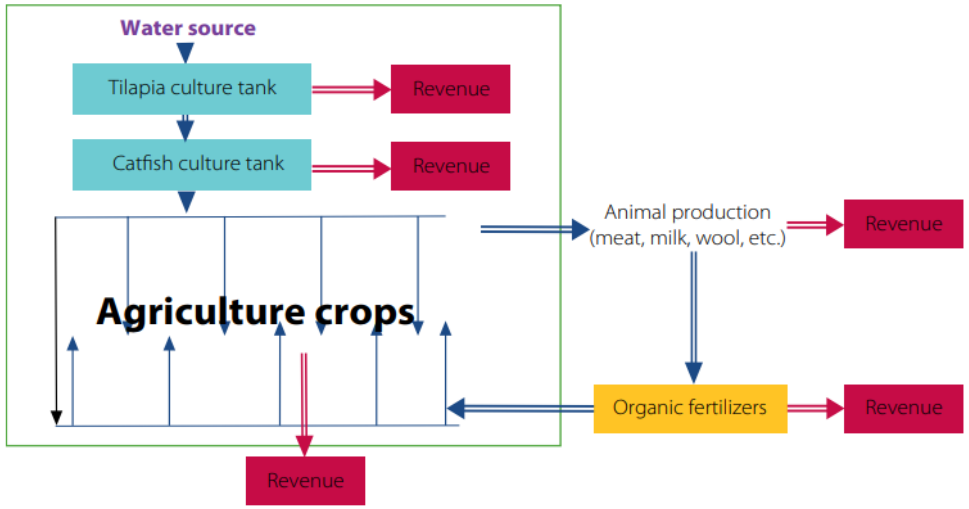
Water Productivity Enhancement

Additionally, as the agricultural inputs prices increase, enhancing the productive value of each cubic meter of water is essential to optimize the feasibility of the agricultural activities. This is achieved through integrated agriculture – aquaculture farms and Solar Powered Irrigation Systems (SPIS).



Source: IFAD – Integrated aquaculture - agriculture (Farmers guide)

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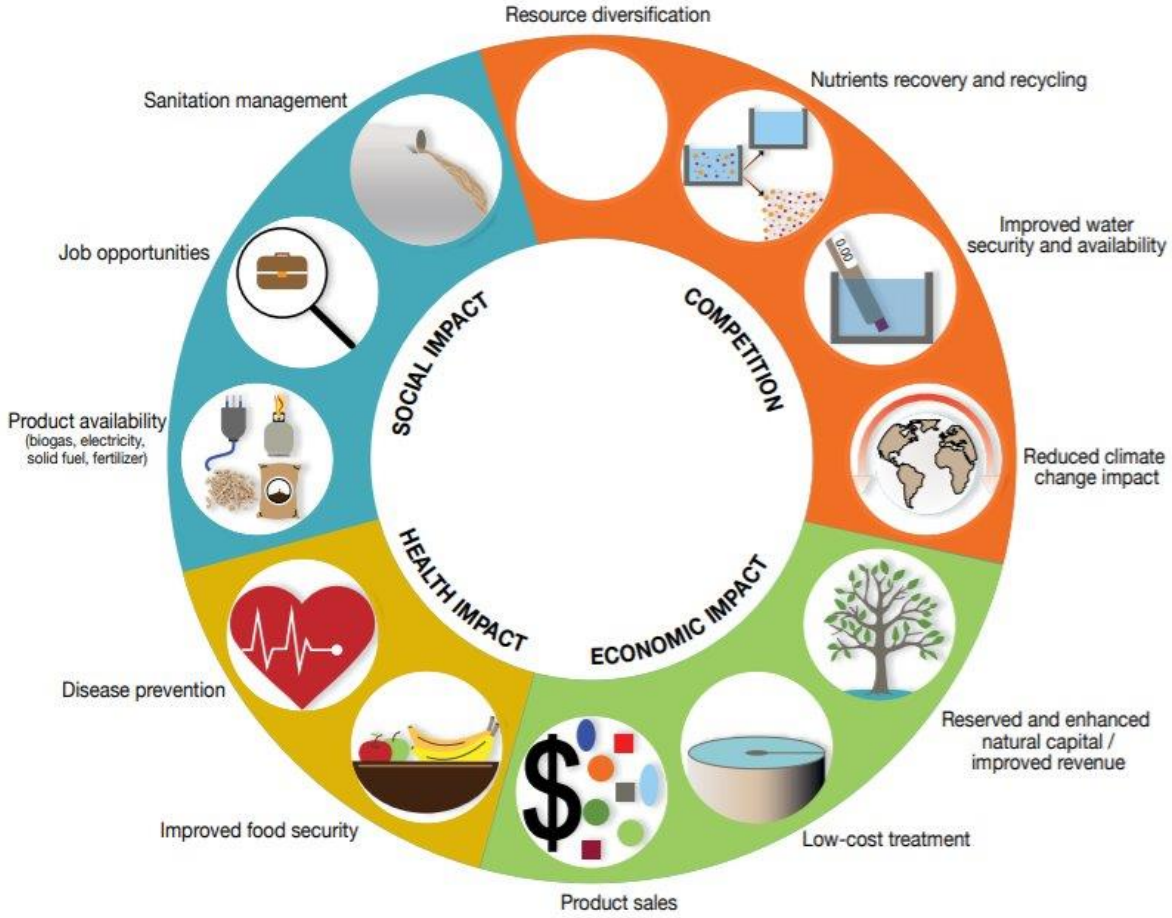
Key Principles of Circular Water Governance

Design Out *(linearity – contradictions)*

Design With *(reuse in mind – efficiency as a purpose)*

Design For *(Economic viability & feasibility)*



Sanitation and Wastewater Atlas of Africa, 2021

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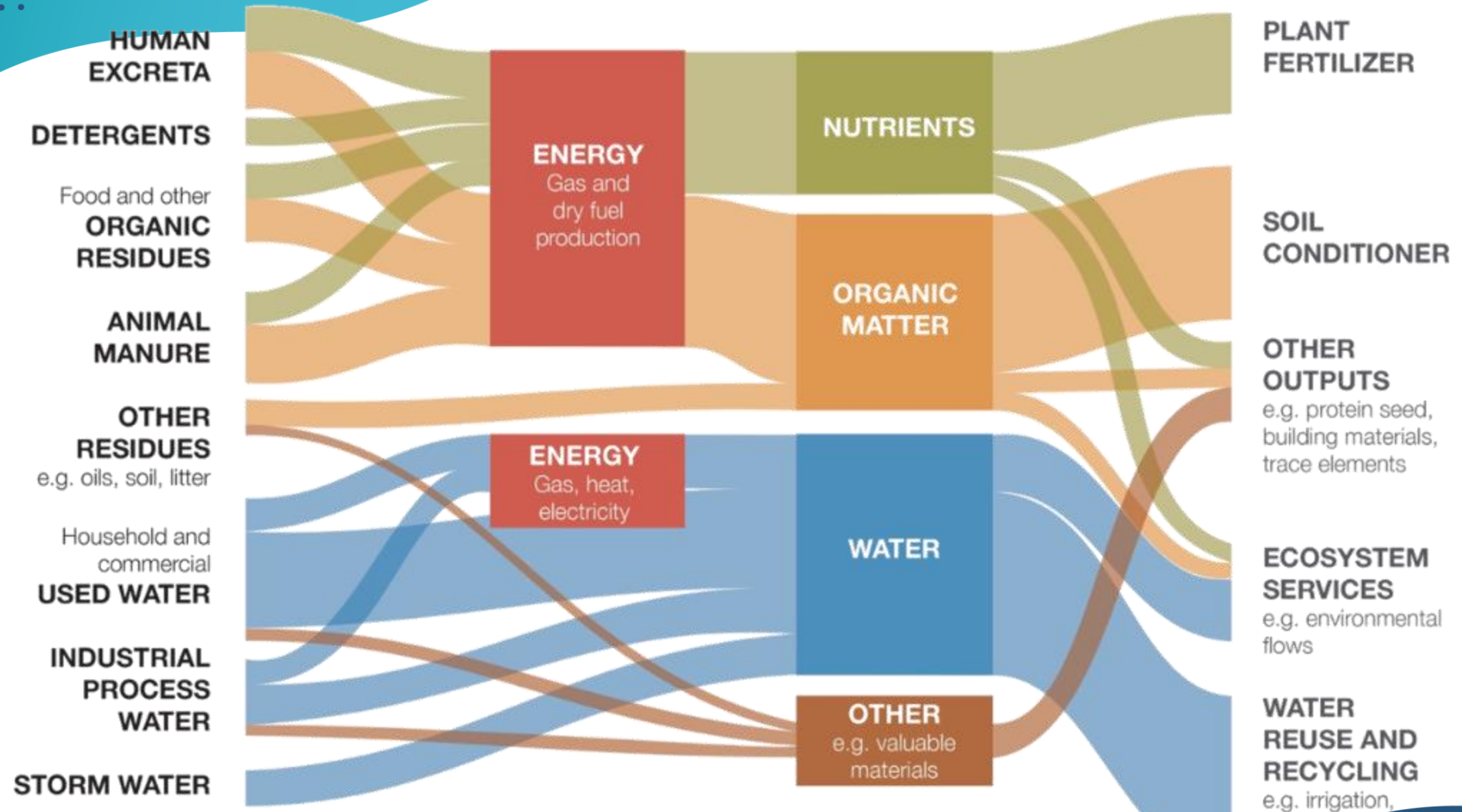
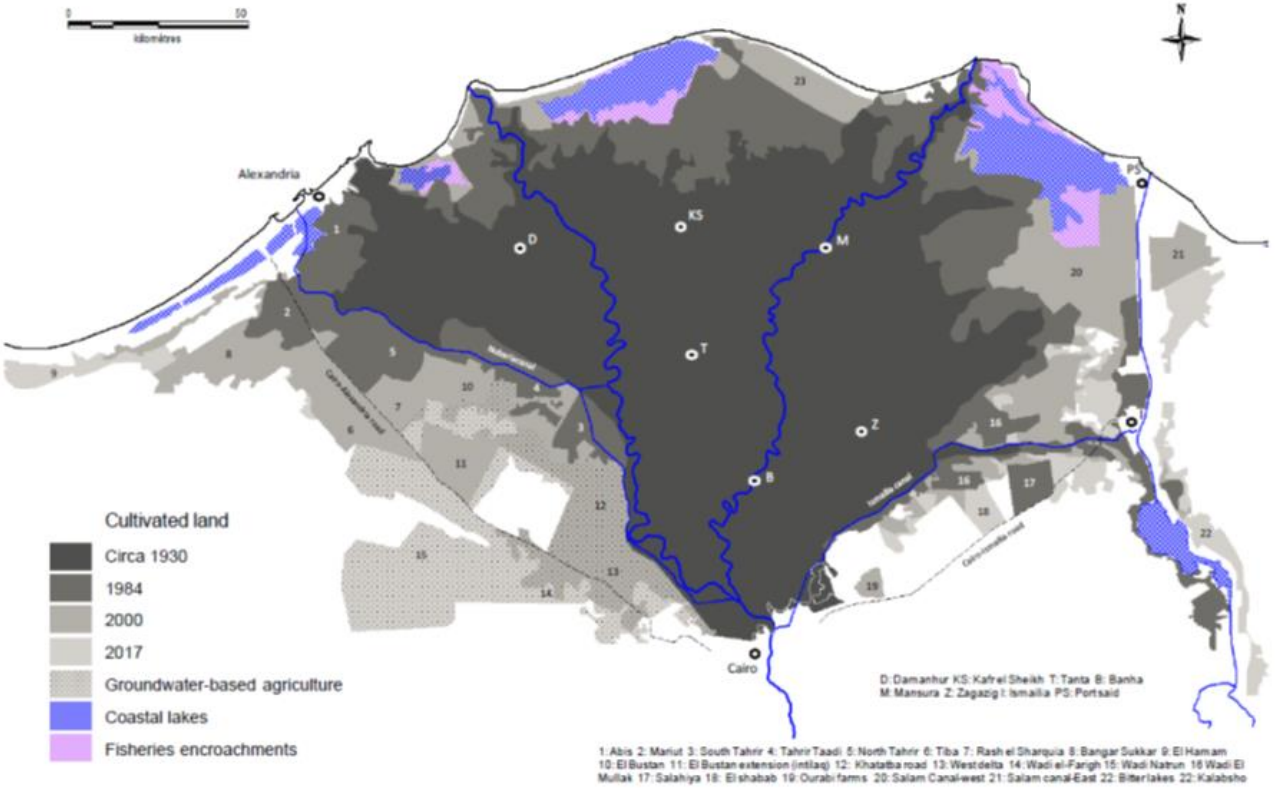
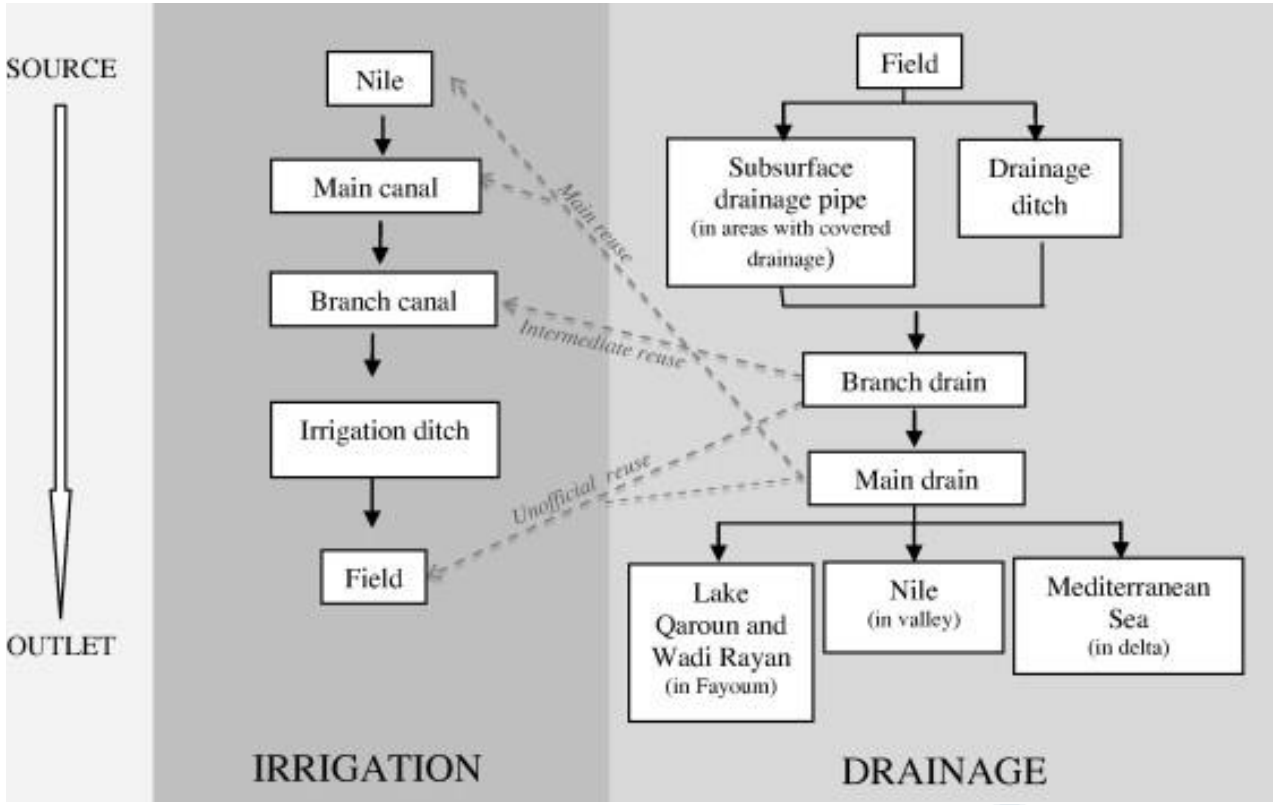


Otoo and Drechsel, 2018

Circularity in AWM – *Desing out/with*



Source: Molle et al., 2016:p 251



Barnes, 2014, p. 185

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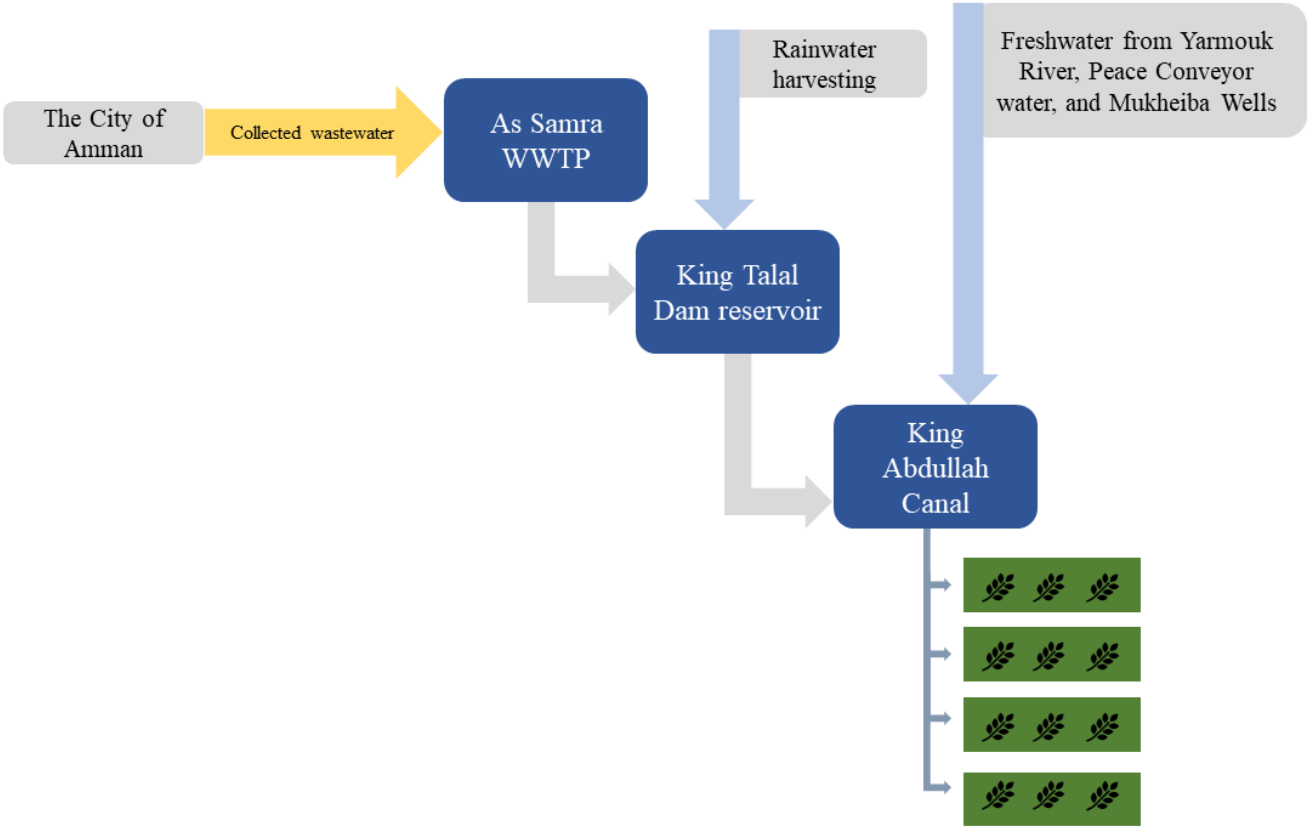
Circularity in AWM – *Desing out/with/for*

Formal reuse (indirect)



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Circularity in AWM – *Desing out/with/for*

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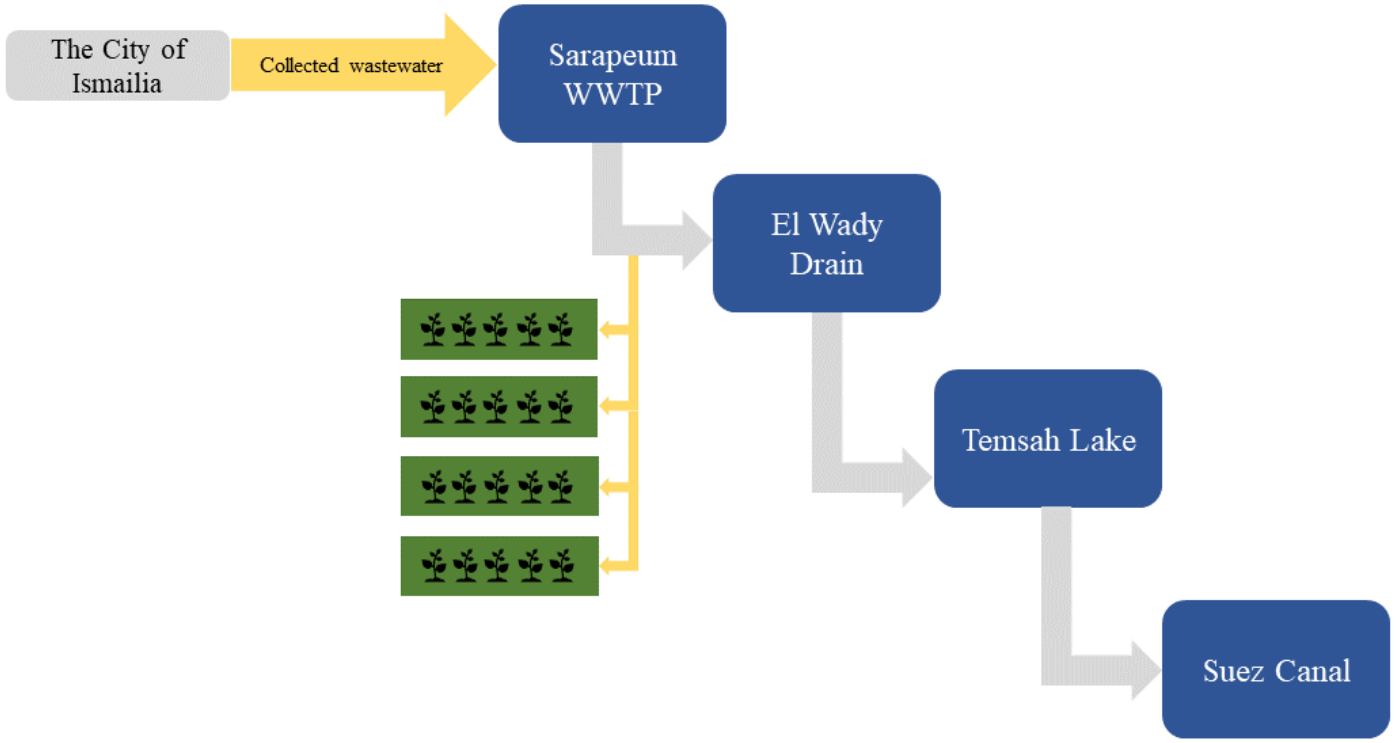

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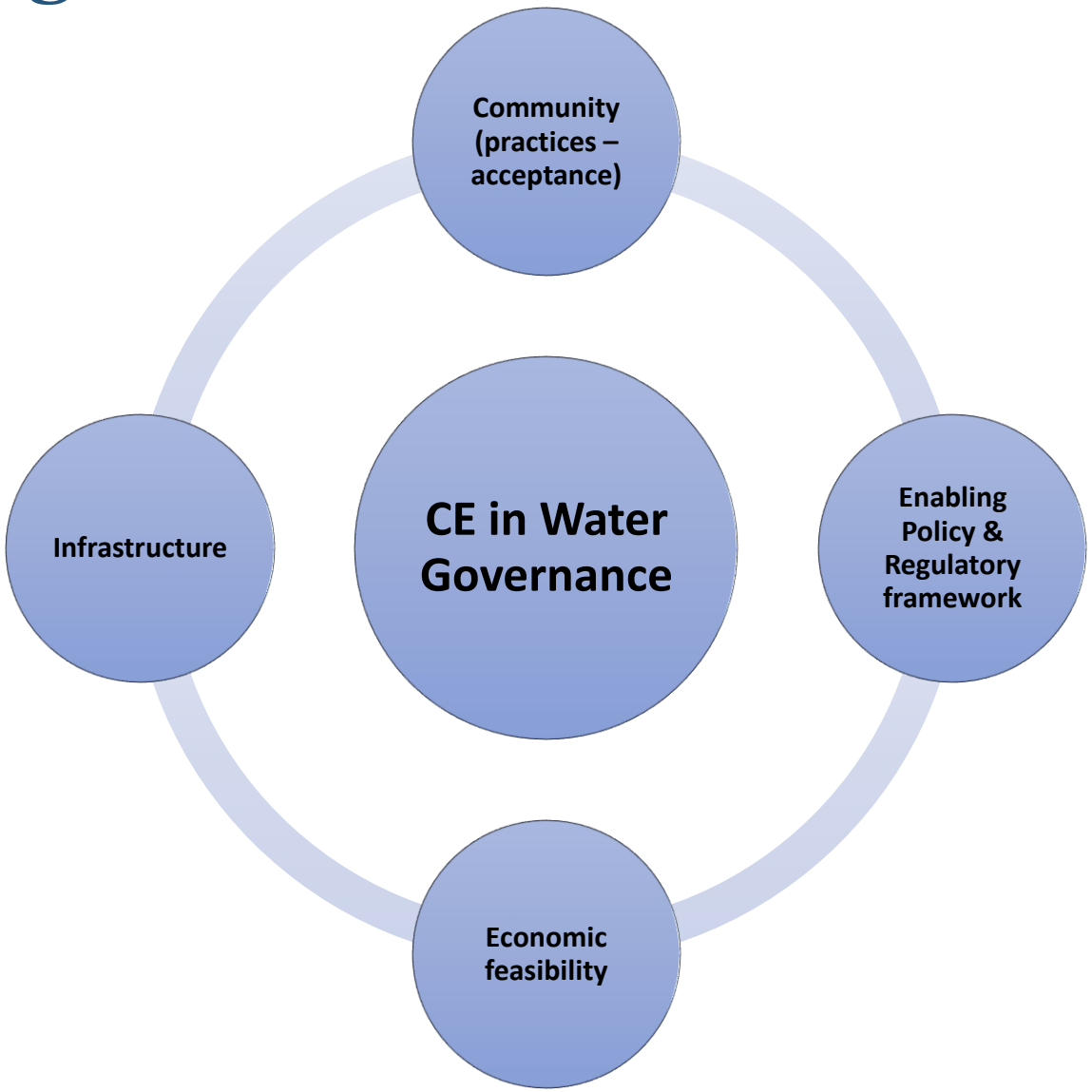
Key Messages



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Thank you

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