WATER IN CIRCULAR ECONOMY AND RESILIENCE (WICER)

Session 4. Cross- Cutting Issues

Objective: Highlight the importance of the right Policy, Regulation and Institutional Environment and stakeholder engagement in WICER projects

Context:
An enabling policy, institutional, and regulatory (PIR) environment is needed to achieve full circularity and resilience in urban water. Even when progress is made at the water utility or city level, regulatory and policy limitations may persist. For example, sometimes there are no clear regulations on the use and sale of resources recovered from wastewater. This discourages municipalities and the private sector to develop projects with circularity in mind. If tariffs for freshwater or energy are too low, few entities will make efficient use of water, reuse treated wastewater, or generate energy in wastewater treatment plants. If wastewater discharge fees or pollution charges are too low, or enforcement is lax, industries have no incentives to minimize water pollution. An enabling PIR environment should encourage the use of recovered resources and enable a market for those resources. It should incentivize interventions in water and energy efficiency and foster renewable energy and nature-based solutions in the water sector, while protecting natural resources. An enabling environment should also use the right economic and policy instruments to set adequate tariffs and prices so that circular alternatives can compete with traditional, linear alternatives, which frequently benefit from subsidies, externalities, and other market distortions. Clear environmental regulations (on water rights, discharge standards, and pollution charges) should foster investments in pollution control and the regeneration of natural systems.

Discussion Questions:
- CIRCULAR ECONOMY AND WATER: Are there any circular economy policies, strategies, or plans in your country? Do they include the water sector, or do they focus mostly on waste management / manufacturing, fashion, etc? Do you think the water sector needs to be included?

Hands-on exercise: Choose option A or B below and continue with the following questions:
Policy, institutional, and regulatory (PIR) environment
- CHALLENGES: Identify the PIR environment in your context that would apply to the WICER project (in water, energy, environment, health, agriculture/food). For example, are there adequate to foster circular economy solutions in the water sector? Which regulations should be in place to enable the WICER projects? Which PIR barriers or challenges do you envision?
- OPPORTUNITIES: How would you overcome the PIR challenges? Can you come up with other ways to overcome the lack of clear regulations that would apply in your context? (for example, agreements or contracts between different parties to clarify the roles and rights – as discussed in some of the case studies). Are there any opportunities?

Stakeholder mapping and engagement: Engaging early with stakeholders is crucial to ensure the sustainability and acceptance of circular solutions, especially when we want to reuse products from wastewater.
- Can you identify all the key stakeholders?
- CHALLENGES: Do you envision any issues with the end user or other stakeholders? How will they react to the project?
- OPPORTUNITIES: How could you engage with them to minimize risks and ensure that the project is successful?

OPTIONS:

Option A: Choose a real project/city that any of you are working on. Explain the challenge to the team, and continue to the PIR and Stakeholder questions below. You are the team in the municipality/utility in charge to make the project successful.

Option B: Use the challenge described for the hypothetical "WICER City". In this case imagine you are the team in charge to make the project successful. For the purpose of this exercise, you can assume that the utility is own by the municipality.
The main goals of the municipality are to expand its wastewater treatment capacity, decrease the pollution in the river, increase resilience by diversifying water sources and increase financial sustainability of the utility, among other. After analysing all the options, the municipality has decided to invest in auditing and upgrading the existing wastewater treatment plant, and to explore the potential for wastewater reuse and the beneficial use of biosolids. The WICER elements are:

- Maximize the use of existing infrastructure and optimize operations
- Reduce the generation of waste and pollution by improving both wastewater treatment processes and the quality of the final effluent.
- Recover resources from wastewater (water, energy, biosolids)
- Regenerate natural systems by improving the quality of the effluent

The municipality needs to first identify the potential end users of water and biosolids and assess their willingness to use them, identifying potential risks and how to mitigate them. Ideally the municipality would like to sell the by-products to improve their financial sustainability. Who should they engage with first? Should they choose one end user of multiple end users?
Potential end uses in the municipality are:
Water: irrigation for green spaces in the municipality, recharge aquifers, irrigation for agriculture (there are cotton crops and fruit trees around the municipality), process water for industry (cooling water for the power plant, process water for a paper mill), other
Biosolids: recover degraded lands in a local forest, use them as fertilizer in agriculture, other
Energy: co-generation of energy and heat to increase energy efficiency in the wastewater treatment plant
Existing regulation:
Water: There is a Regulation on Technical requirements for Wastewater Treatment Plants that covers the treatment level and quality requirements to reuse water for irrigation purposes. However, it has little information in terms of roles, responsibilities, and management of risks, etc. Moreover, it focuses only on irrigation, no clear standards for other uses such as industrial. Regarding water tariffs, farmers pay significantly less to extract groundwater than industry does.
Energy: WWTP are allowed to generate energy for their own consumption and there are subsidies for municipalities to generate renewable energy and to implement energy efficiency audits.
Biosolids: currently the regulation considers biosolids as a hazard waste that needs to be disposed in landfills. However, new legislation is coming up to allow the beneficial use of biosolids in the near future.
There might be other regulations relevant to the project, and the municipality is trying to map them out.

TEMPLATE:

PIR that will apply to the WICER project:

Stakeholder mapping:

Stakeholder	Role relevant to WICER	Potential Risks/issues	Engagement mechanisms

Cheat Sheet for moderators:

Regulations:

Health regulation: regarding the quality of treated wastewater, monitoring & enfonrcement of quality standards (who needs to monitor water quality), allowed crops to be irrigated depending on the quality of treated wastewater

Agricultural Regulation: quality of treated wastewater by type of crop, irrigation technique allowed by crop, monitoring soil quality, etc.

Technical Regulation for wastewater Reuse: regulation of quality of treated wastewater, choose treatment depending on end-use, delivery, monitoring,.

Energy regulations: regulation regarding energy generation in wastewater treatment plants for self use

Environmental Regulation: quality of wastewater and other solids released back into the environment, definition of point of compliance for each involved actor (where the responsibility of the wastewater treatment palnt operator ends and where the responsibility of the next actor in the chain starts when reusing wastewater)

Economic Regulation: treated wastewater tariffs; cost efficiency (O&M costs of treatment, transport, monitoring, etc., and who is responsible), incentives etc.

Existing water permits/rights of farmers: regulation, enforcement, etc.

Stakeholders:

Rational for early stakeholder engagement:
International experiences show that resource recovery projects can be delayed or can fail if the negative perceptions of reclaimed water and reuse products have not been adequately assessed and addressed

For agriculture purposes:

- There is low social acceptance of the use of products made from recycled human waste. Risk: people rejecting to buy vegetables and fruits irrigated with treated wastewater, impacting the farmers.
- Some farmers have been using untreated wastewater for years, and think that the organic matter in untreated wastewater is good for their crops.
- Both farmers using freshwater and farmers using untreated wastewater might not be willing to switch to treated wastewater without additional incentives. Risks: End-user not willing to use treated wastewater once tertiary treatment is built, farmers opposing the project
- Farmers might not have clarity on who is responsible to monitor the water quality, which crops they can use and what happens to their existing water rights. Risk:

the expected environmental benefits are not realized if farmers continue using both freshwater and treated wastewater

- Farmers might not be willign to pay for treated wastewater
- Engaging key stakeholders before the implementation of the project, can help mitigate these risks

Industrial end-use

- Financial & environmental sustainability: International examples on reuse show that the sale of treated water to industry can help cover O&M costs of the wastewater treatment plant, making the project more financially sustainable and freeing up (or subsidizing) water resources for irrigation or environmental purposes. There are also cases of industrial users buying secondary treated wastewater and treating it further onsite, substantially lowering treatment costs for the municipality.
- The industrial sector is also a big water user and polluter and usually can afford to pay a higher tariff for treated wastewater than farmers, making the system more financially sustainable.
- Transport costs: Cost of transporting water to end user is usually lower compared to irrigation associated costs, since it is usually one industrial user or a cluster of industries
- Easier monitoring of water quality – less users and less points of delivery, lower health risks. And easier transactions, since the delivery of water can be to only one end user or one cluster of users

Example of Stakeholders: end-users (industry, agriculture, environmental purposes such as groundwater recharge), general public, regulators (in water and other relevant sectors), private sector

Engagement mechanisms:

- Information and awareness campaigns on: the benefits of using treated wastewater to mitigate water scarcity, safety of consuming vegetables irrigated with wastewater, etc.
- Stakeholder engagement workshops to inform project design and implementation:
    - Identify end users of treated wastewater and recovered resources (type (farmers, industry, other private sector users), location, quality of wastewater needed, etc.). Identifying the end users before the implementation of the projects also allows to potentially choose the location of the WWTP and treatment technology according to the end users (not the other way around) – fit to purpose – to reduce costs (for example, if end user grows non-edible crops such as cotton, treatment requirements might be lower, lowering capital and O&M costs).
- Supply-demand contracts between municipality and end user, clarifying roles and responsibilities for each party, duration of contract, water quality and monitoring, etc