

Circular Economy innovations: the potential solutions in water sector

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Abstract

Industrialization and urbanization have contributed to the increase in greenhouse gas emissions and climate change has become a reality that humanity faces every day. Climate change, reflected in variations in precipitation and temperatures, has significant negative effects on the quality and availability of water resources, agriculture production and human health around the world. Indeed, 40 per cent shortfall in freshwater resources by 2030 coupled with a rising world population has the world careening towards a global water crisis. Recognizing the growing challenge of water scarcity (two-thirds of mankind will face water scarcity by 2025) [1], the UN General Assembly has mobilized action that will help transform how we manage water [2]. The limits of natural resources and the recent warnings about waste pollution are encouraging the development of a circular economy. Therefore, a transition to a circular economy could create significant synergies for the wide adoption of water reuse as an alternate water supply.

This presentation therefore examines opportunities with the transition to circular economy using an innovative system for the treatment of wastewater as well as the reuse of wastewater in agriculture. Therefore, we underline that irrigation offers real prospects for large-scale recovery of wastewater, helping to reduce the deficit and conserve water resources, and increase agricultural productivity.

Generally speaking, the increased demand for water for domestic, industrial and irrigation use will increasingly have to face the limits of this resource! On the other hand, water sources traditionally used for agricultural applications include groundwater and surface water. Therefore, using the NCWR including, desalination and properly treated municipal wastewater, can be an ideal solution. [3]

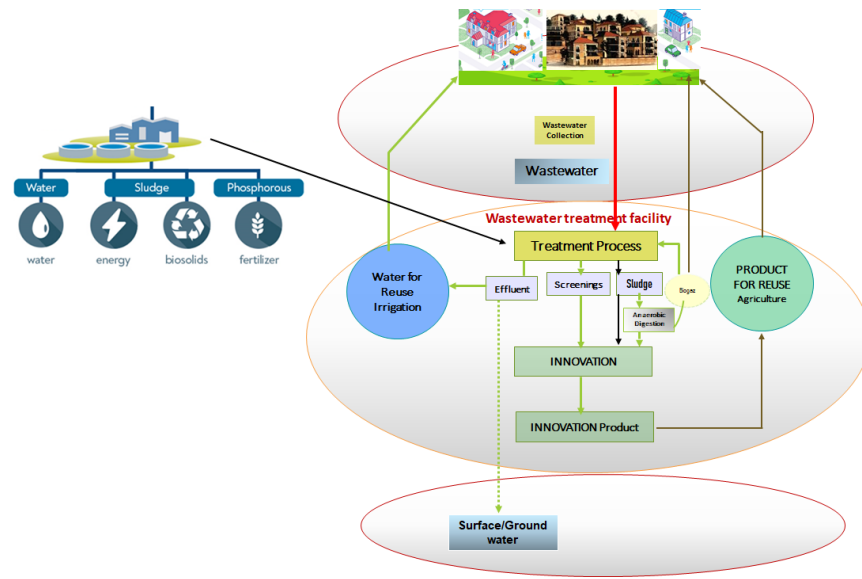
However, the major role played by desalination technology in meeting the growing demand for water in regions where water is scarce, this technology is very demanding in energy and additional post-treatment will be necessary. For this, we focus on a concept of “Decentralized Wastewater Treatment Systems” (DWTS) [4]. that can contribute to wastewater innovations and help in improving water quality.

In the last part of this presentation, we demonstrate that the Decentralized treatment is an important solution for global water scarcity and climate resilience challenges and describe the benefits of Decentralized Wastewater treatment system as an innovative wastewater treatment system [5]. Finally, we conclude by the Aquacycle project (ENI CBC Med) that effective wastewater treatment and treated water reuse applications can deliver environmental, economic and social benefits [6].

Keywords: water, wastewater, sustainability, Circular Economy, treatment, reuse, irrigation, DWTS.

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Graphical Abstract

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