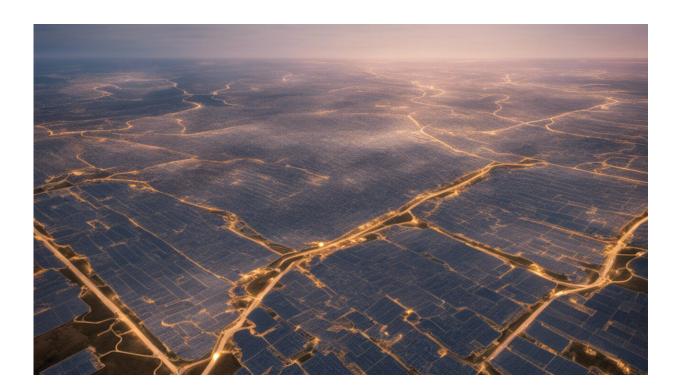# How to manage water systems for long-term sustainability

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Credit: AI-generated image (disclaimer)

The concept of a circular economy (CE) promotes reparability, durability and recyclability, unlike the traditional linear economy that is based on the take-make-consume-dispose pattern involving the using up of resources. As such, CE can help lower the use of resources, decrease waste production and limit energy consumption.

Similar to the use of raw materials, the water sector adopts a linear model with a "take-use-discharge" approach, as pointed out in a [white paper](). In such a system, water is withdrawn from streams, rivers, lakes, reservoirs, oceans, and groundwater aquifers as well as harvested directly as rainwater. It's then used by agriculture, industry, society and the environment and "returned" to the water basin directly or through a treatment facility. However, during this process, water is lost, polluted and wasted, so efforts to increase efficiency and optimise reuse have intensified in recent years. Enter the EU-funded NextGen project that focuses on demonstrating innovative CE solutions for water in 10 cases across Europe and beyond.

Supported by the project, a team of researchers has outlined the opportunities and challenges involved with CE solutions for the water sector in a study published in the journal *WIREs Water*. According to the authors, the key to successful transition to a CE requires "active involvement from all members of society and strong levels of collaboration," as noted in the study. "Enabling diverse stakeholders to engage and share different perspectives, interests, and needs, and ultimately to co-produce knowledge, communities of practice (CoPs) are seen as a suitable approach to discuss CE water technologies in their institutional context."

Quoted in a news item, study co-author Jos Frijns from NextGen project coordinator KWR Water Research Institute emphasises that CoPs "need to be organized and well facilitated" so that they do not end up as "time-consuming gatherings without any [social learning]()."

Shared interest

CoPs are defined as groups of people with a shared domain of interest and who deepen their knowledge and expertise in this area by interacting on an ongoing basis through social learning processes. In the *WIREs*

Water journal article, the researchers propose "a CoP evaluation framework to draw together a consensus on the methods used for evaluating water knowledge co-production and social learning processes in the transition toward the CE." They add: "CoPs in NextGen cover four key topics: setting the scene, closing the loop, implementation, and upscaling and evaluation. The proposed evaluation framework will be further used in NextGen to test and improve its reliability among practitioners in the water sector."

The demonstration cases of the ongoing NextGen (Towards a next generation of water systems and services for the circular economy.) project cover several countries: Germany, Greece, the Netherlands, Romania, Spain, Sweden, Switzerland and the United Kingdom. The 10 demonstration CoPs "bring together representatives from the water industry (operators), authorities (regulators), engineering companies, consultants, research institutes, representatives of non-governmental organizations, and potential end-users," as stated in the same journal article. The NextGen project will run until June 2022.

More information: NextGen project website: nextgenwater.eu/

Andrea Fulgenzi et al. Communities of practice at the center of circular water solutions, *WIREs Water* (2020). DOI: 10.1002/wat2.1450

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