Factors Affecting The Adoption of Water Reuse Technologies: Evidence from An Italian Case

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Abstract
Water reuse is a fundamental step toward the circular economy, and a necessary action to relieve pressure on freshwater natural resources. The adoption of water reuse technologies plays a crucial role in the water reuse strategy. Water utilities and potential final users are key stakeholders in the investment decisions in water reuse technologies Their decision-making process is complex and is influenced by several factors, particularly, barriers and drivers - factors recognized to respectively hinder or foster a decision-making process. However, extant literature has not focused on barriers and drivers perceived by water utilities and potential final users. To provide technology adopters with adequate support in their decision-making process, barriers and drivers must be properly evaluated.

To shed light on the issue, we performed an embedded case study in a relevant Italian water utility, considering 8 water reuse plants as sub-units of analysis, for a total of 14 interviews with 17 informants. The case selected is relevant for the adoption of water reuse technologies and processes due to water scarcity and degradation of aquifers in the region. Adopting an inductive approach, we determined the most relevant barriers and drivers for the context investigated. Community acceptance and a limited market for water reuse, together with past technological and unfavorable location-related choices emerged as relevant barriers, while policy instruments, coordination among different institutional and operational levels, and the perception of water scarcity can support the adoption of water reuse technologies. As the sub-units of analysis, although in the same context of the investigation, differ for the management of the reclamation and distribution processes, capacity, and final reuse of water, we provided a preliminary evaluation of the moderating impact of these contextual factors on the relevance of barriers and drivers. Additional research is needed to compare the obtained results with other contexts of investigation.

Towards The Development of A Comprehensive Methodology for Product Circularity Assessment

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Abstract