

Institutional arrangements of water reuse: new challenges for the transition to a water circular economy

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INTRODUCTION AND OBJECTIVES

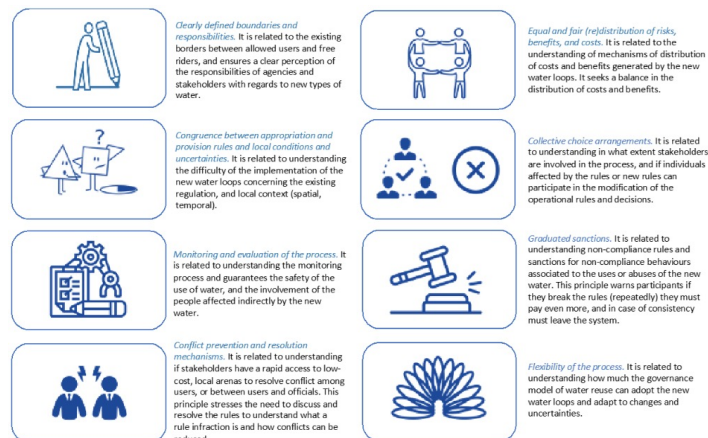
To move away from linear into circular models of production and consumption, there is a need for suitable institutional arrangements, i.e., clear sets of norms and rules regarding the distribution of responsibilities of relevant stakeholders involved in the implementation of water circular economy (WCE).

This research analyses the institutional arrangements associated to the water reuse management on the demosites of Project Ô, to assess their preparedness for the implementation of the new water loops, and to address the potential barriers and challenges to be faced in local contexts.

METHODOLOGY

Institutional Analysis and Development (IAD) framework was originally developed by Ostrom (2005, 2011) and has been applied to water governance contexts to provide key insights on water institutions, and to identify gaps and advantages of specific institutional arrangements (Ching & Mukherjee, 2015; Heikkilä et al., 2011; Sanches et al., 2021; Schlager & Heikkilä, 2009).

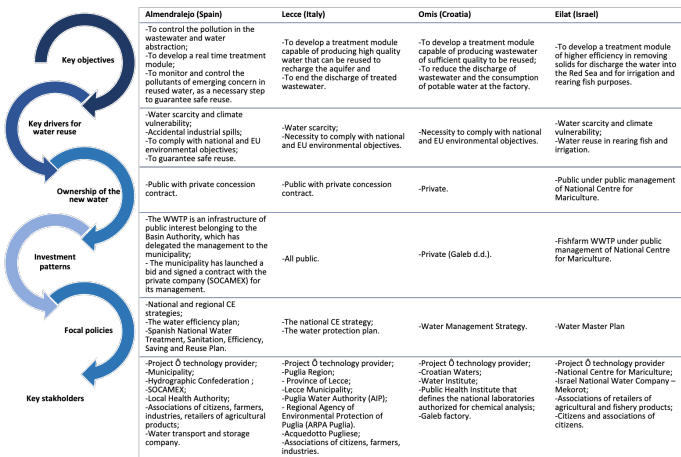
Considering the scale and complexity brought by the new water loops of Project Ô, this study uses the Ostrom (2005) design principles but specifically adapted to water reuse.



KEY INSTITUTIONAL DESIGN PROPOSITIONS FOR GOVERNANCE OF WCE

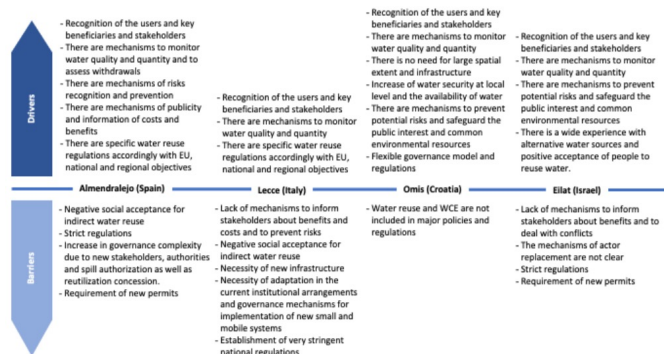
RESULTS

The results first describe selected key contextual features of the sites, second analyse the key institutional design principles, and other additional regulatory and awareness factors, when considering the governance of water and focus on the consequent drivers and barriers within and across case sites.



KEY CONTEXTUAL FEATURES

The new water loops require new mechanisms for clear monitoring, risk prevention, conflict resolution, dedication sanctions and collaboration schemes. This calls for careful attention and adaptation of institutional arrangements. Almendralejo (Spain) and Lecce (Italy) have several challenges for implementation but appear capable of accommodating them. Special attention should be given to cooperation on water monitoring, adaptive management, and regulation with the aim of preventing risks.



MAJOR DRIVERS AND BARRIERS FOR INSTITUTIONAL ARRANGEMENT PREPAREDNESS AND IMPLEMENTATION OF WATER LOOPS IN THE DEMOSITES

Design principles	Almen	Lecce	Omis	Eilat
Clearly defined boundaries and responsibilities				
Equal and fair (re) distribution of risks, benefits and costs				
Congruence between appropriation and provision rules and local conditions				
Collective choice arrangements				
Monitoring and evaluation of the process				
Graduated sanctions				
Conflict prevention and resolution mechanisms				
Flexibility of the process				
Adequacy of regulations for adoption of Project Ô				
Potential blockages from concession contracts				
Awareness and yuck factor				

(Scale: Red – Institutional arrangements require strong attention; Yellow – institutional arrangements require some attention; Green – institutional arrangements less attention; White – unable to assess.)

EVALUATION OF PREPAREDNESS OF INSTITUTIONAL ARRANGEMENTS IN PLACE

The analysis shows that most demosites are fairly well prepared to accommodate the implementation of water loops. Nevertheless, it is essential to clearly define responsibilities avoiding overlapping and fostering strong collaboration amongst stakeholders in implementation and operating the new water loops and clearly recognise the users and free riders recalling the works of Abderrahman (2000), Trapp et al., (2017) and Ostrom (2005).

CONCLUSIONS

The analysis showed that the more water uses and users a new water loop involves the more critical the institutional arrangements become. On Almendralejo (Spain) and Lecce (Italy), there are different players involved in the management of the water loop, and institutional arrangements appear more critical. In Omis (Croatia) the institutional arrangements of the demosites do not configure severe barriers. Among the different institutional design principles, the clearly defined boundaries of responsibilities among stakeholders, the congruence between appropriation and provision rules and local conditions, raise more concerns on the case studies and call for the attention of future research on water circular economy

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