

Water reuse presents an opportunity to address water scarcity in regions affected by climate change, however, this requires changing the way wastewater is governed to manage the associated risk.

The principles of risk assessment and risk evaluation are not consistently and thoroughly included in risk management policies. Though policies incorporate risk management steps, they vary in the thoroughness and choice of steps taken. There is a coalescence around three evaluation factors: crop categories, water classifications, and irrigation methods for dictating and communicating what risk reduction actions must be taken. All policies require risk reduction actions (e.g., signs warning the public and water treatment standards), but these are constituent between the policies. Risk reduction actions appear to be designed with human health first and foremost in mind, potentially neglecting environmental health concerns. The knowledge and jurisdiction needed to carry out risk management tasks extends beyond the control of water treatment operators and relies heavily on end-user compliance for enacting risk reducing actions. A challenge in the water reuse sector is knowing what parameters to monitor and at what concentration levels they pose risks. This is due to the complex nature of water reuse and the uncertainties inherent in risk. The uncertainties and complexity of water reuse are minimally alluded to in water reuse policies, but present significant challenges to managing risk.

This thesis analyzed the water reuse policies of the EU Member States with the highest rates of water reuse who also had national level legislation governing water reuse for agriculture (Cyprus, France, Italy, Spain, Portugal), the recent EU Directive 2020/741, the state of California, and Australia's water reuse policies through a risk management lens. Water scarcity is an increasingly prevalent problem, with changing hydrological regimes due to climate change and human development taxing freshwater systems. One way to tackle this issue is through planned water reuse. To gain public acceptance and achieve maximum scale, clear and potentially new risk management guidance is needed for the sector.