

Thesis
2021-2023



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Funding

45% INRAE

45% AE RMC

10% ECOFILAE



Applying multiple barrier approach in participatory and integrated risk management of wastewater reuse projects



Use a participatory modeling approach to build a simulation tool that allows stakeholders to create and test different pathogen risk management scenarios

Context and challenges

The European Commission published Regulation (EU) 2020/741 of May 25, 2020 on the minimum requirements for agricultural water reuse, which will come into effect in June 2023. To manage sanitary risks, this regulation specifies water quality classes according to the intended uses of the wastewater. The classes are even stricter than those defined in the ministerial decree of August 2, 2010, which was modified on June 25, 2014. Achieving the specified water quality often requires the use of additional treatment technologies, with a negative effect on both the economic and environmental balance of the projects. The European regulation also considers another approach to risk management: Management By Barriers (MBB), i.e. the implementation of protection measures throughout the reuse process rather than management only based on advanced treatment processes.

Objectives

The objectives of the thesis are:

- Draw up an inventory of existing knowledge on possible barriers. The thesis can use the « Multi-barrier » project submitted by the INRAE Reuse network;
- Use a participatory modelling approach to build a simulation tool that will allow stakeholders to create and test various « multi-barrier » scenarios and compare them using different indicators (health, economic and environmental). The stakeholders will discuss the scenarios among themselves and finally define an « ideal » scenario to ensure sufficient health protection as well as comply with the European regulation concerned;
- Evaluate the participatory process (format, number, type and duration of the workshops) using the monitoring and evaluation methods formalised by the ComMod group as well as the resulting scenarios.

The simulation tool will be tested on different water reuse projects: existing agricultural projects (typology 1), new agricultural projects (typology 2) and finally urban projects (typology 3).

