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THE REUSE, AS A REINVENTION OF WASTEWATER?

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Abstract

In 1989, a water reuse project was developed in the Saint Mathieu de Trévières municipality (South France). Today, the territory actors seem to be totally rediscovering this practice. The aim of this article is to understand this oversight by resocializing treated wastewater. The results show, over time, a different partnership of actors and interests, which can explain the omission of this original TWW reuse project as well as the requalification of this practice.

Key words: wastewater reuse, socio-technical, local, requalification, France

Introduction

In the Pic Saint Loup region (PSL), TWW reuse has been quietly talked about since 2016 as a potential for territorial development. The originality of this practice raises questions. Since 30 years, a technical device installed in the municipality of Saint Mathieu de Trévières (SMT) has been based on the principle of wastewater reuse. Nevertheless, this water reuse project is rarely mentioned, indeed forgotten. The local actors give the impression to rediscover this practice. Why does Saint Mathieu's project appear "naturalized" and no longer received attention? Our reflection is based on this observation and on the hypothesis that the past water reuse device - similar to every technical devices (Akrich, 1993, Aubriot, 2018) - is not according with the current definition.

The practice of water reuse is not new practices around the world (Barles, 2005, Cirelli, 2006). In the literature, this long history is used either to justify the relevance of using the wastewater (Angelakis et al., 2018, Hamlin, 1980), or to draw lessons about project success or failure (Po, Nancarrow et al. 2003, Lazarova et al., 2007). In agreement with Russell and Lux (2009), these mainly descriptive approaches contribute to make this practice as socially disembodied practice in the territory scale, or even the "hydrosocial contract" (Farrelly and Brown, 2014). Wastewater seems to pass through the time or places without changing. The aim of this article is to provide a "narrative" of the experience conducted at SMT by resocializing treated wastewater and then to compare it with the project imagined since 2016 on the PSL territory. By socialization, we mean the identification of the actor partnerships involved in the reflections about TWW reuse and the identification of their interests.

To answer these questions, a qualitative survey (2016 to 2019) was carried out with the stakeholders of old SMT project (engineers, municipal agents, researchers, elected officials) (n=10) and those who are currently concerned by the water reuse perspective (n=27). The analysis of old technical reports was cross-referenced with stakeholders' declarations. The aim was to identify the development in the water reuse practices over time (actor coalition, interests, and materiality).

Wastewater device trajectory at Saint Mathieu de Trévières

In 1977, an infiltration analysis were carried out by the hydrogeology laboratory and the Center of geological and hydrological studies and research (CERGH) in the University of Montpellier. The measurements showed that the discharges of SMT wastewater treatment plant into the Terrieu stream pollute the drink water source (called Lez) that supplies the current Montpellier agglomeration. In 1981, a Declaration of Public Utility defined a protected drinking water area. The elected representatives of SMT municipality are invited by the Regional Health Agency to achieve the "Zero Discharge" objective in the Terrieu stream. In 1989, the project entitled "Reuse of treated effluent at SMT: experimental forest irrigation" was proposed as a solution by a group of researchers, led by Professor Brissaud (recognized a few years later as a "Reuse expert"). The project was planned that the treated wastewater from activated sludge plant will be diverted to irrigate 5 ha pine forest. SMT Reuse project was defined as an "experimental" project. This demonstrator aims to provide answers about the

treatment effects of soil (Figure 1). The system is cheap and quickly installed (the links between the actors involved facilitate arrangements).

Soon, the demonstrator aspect of this project disappears. The researchers at the University of Montpellier are withdrawing from the project. In 1997, the state authorities highlight many dysfunctions (irrigation schedule, water flow rate) which raises the question about the technical device effectiveness to achieve the "Zero Discharge" objective. The engineering company is forced to redesign the irrigation system and to enhance the irrigated area. Since, the reuse system has many damages and maintenance problems. Indeed, the administrative agreement does not clarify the responsibilities of each. For 20 years, the system was managed on basis of oral arrangements between the sanitation company and the private owner, and later with the municipal agent. They distribute with each other the maintenances to be carried out according to their size (of the leak for example). Nevertheless, the treatment effectiveness remains uncertain as said one of our interlocutor: "*We don't know, we don't know where this water goes, we don't know what happens to it in the end*" (Engineer). Since 2018, SMT's treatment plant has been renovated. A baffle channel will replace the old device forest irrigation system.

Shifting interests: a requalification of the wastewater reuse

Over the past 30 years, the Reuse definition of the SMT project has gradually changed, as have the interests attached to it. Initially, a partnership of actors was formed to solve the environmental problem related to the drinking water source pollution used by Montpellier population. In this context, the researchers used the SMT experiment to broaden their investigation issues on real conditions. For engineering experts, TWW was a technological challenge, to design a hydraulic and irrigation device for this singular water. The SMT mayor was content with this an innovative, reasonable budget and rapid installation solution. At the end of 1990s, this coalition disintegrated with actors' disinterest. Indeed, the experimental framework loses its meaning and researchers shift their cognitive investment to other sites. The private owner of the pine forest is comforted to see his plot protected from property pressure because it is necessary for the treatment process. The elected officials of SMT and Montpellier are satisfied by the principle of diverting wastewater from the watercourse. Therefore, after the first moments of project installation, it is no longer the subject of attention. The care on it

disappears. The prime contractor and the municipal agent then inherit a technical device in which they have not participated in the beginning and simply tinker with it to ensure its functioning. An installation of a modern UV device make the previous one obsolete. It should be noted that the SMT wastewater reuse system is similar to another called the «Vegetative Treatment System". Nevertheless, it never has not been qualified with this term, which probably could have rehabilitated the interest.

Currently, the Reuse is being promoted by an "epistemic community" (Haas, 1992) of experts as a solution to climate change and water resource reduction (water stress, drought, maintenance of biodiversity, agricultural activities). Presented as a promising solution, the Reuse would be working for a rational water management. Regularly compared to other devices (desalination or water transfer process), the promise is based on environmental and social benefits (Lazarova, and al. 2001). As such, the principles of the circular economy are used to give treated wastewater the image of recyclable resources and no longer that of "taboo" waste (Jeanjean, 2000).

This qualification of the Reuse reinforces the omission and disinterest in the SMT project by two aspects: in terms of the problem identified and the coalition of actors. In 2016, wastewater reuse is imagined as a solution to water scarcity for the irrigated viticulture development, the main local economic activity. In this perspective, the Reuse solution interests the local elected officials who are concerned to answer the local demand from winegrowers. It is also an opportunity to promote an innovative and modern territory where the challenges of climate change are being considered. They are accompanied by a consulting company (REUSE expert) in charge on manage the community projects and whose reputation partly depend on the concrete achievement of TWW design. Waiting a water sustainable transfer, the local winegrowers are interested by the Reuse as an alternative from their demand. Thus, wastewater is considered as a potential to perpetuate the high value-added crops and participate in the development of fast-growing sectors. The issues are more focused on economic than environmental concerns. However, the Montpellier agglomeration maintains a definition of the Reuse as a guarantee to improve the quality of the wastewater treatment, which infiltrates to the Lez source.

Depending to the moment, the wastewater reuse has been shape within two coalitions of actors. Indeed, the reuse solution was adopted for very differently problem (environmental, then economic). In this way, the wastewater reuse practice was requalified. Indeed, if it is still a question of irrigating with treated wastewater, the expected promise behind the technical solution is no longer the same. In 1989, it was applied an ingenious, effective and inexpensive treatment device. Since 2016, the practice is considered as a sustainable technique to promote a responsible development of irrigation. This reinvention of wastewater partly explains this kind of rediscovery of their reusing by the current local actors.

Conclusion

The water reuse is not a standard practice. Based on the aim to resocializing local wastewaters, this study shows that it is now a completely different Reuse from the one discussed in 1989. Questioning actors and interests allows us to extract ourselves from a purely technical conception of this practice and to avoid adopting a definition of a "plastic word" (Cirelli, 2006) that would only make sense in a specific situation. This study invites us to continue the reflection about the socio-technical broader in order to understand the plurality of translations of wastewater reuse practice (TWW reuse, RDW, NEWater, water reuse...).

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References

- Akrich M. (1991). L'analyse socio-technique. In : *Gestion de la recherche: nouveaux problèmes, nouveaux outils*, D. Vinck, M. Akrich (eds.) De Boeck Professional Publication, Paris, France, pp. 339-353.
- Angelakis A. N., Asano T., Bahri A., Jimenez B. and Tchobanoglous G. (2018). Water reuse: from ancient to modern times and the future. *Frontiers in Environmental Science* 6(26).
- Aubriot, O., Fernandez S., Trottier J., and Fustec K. (2018). Water technology, knowledge and power. Addressing them simultaneously. *Wiley Interdisciplinary Reviews: Water*, 5(1).

- Barles S. (2005). *L'invention des déchets urbains: France, 1790-1970*, Editions Champ Vallon, Paris, France.
- Cirelli C. (2006). *Environnement et usages de l'eau. Pratiques agricoles à risque aux marges des villes mexicaines*. PhD thesis, University Paris VIII Vincennes-Saint Denis, France.
- Denis J. and Pontille D. (2015). Material ordering and the care of things. *Science, Technology, & Human Values*, 40(3), 338-367.
- Farrelly M. A., and Brown R. R. (2014). Making the implicit, explicit: time for renegotiating the urban water supply hydrosocial contract? *Urban Water Journal*, 11(5), 392-404.
- Fressoz J. B. and Bonneuil C. (2016). *L'Événement anthropocène. La Terre, l'histoire et nous: La Terre, l'histoire et nous, 2nd edn*, Editions du Seuil, Paris, France.
- Haas P. M. (1992). Introduction: epistemic communities and international policy coordination. *International organization*, 46(1), 1-35.
- Hamlin C. (1980). Sewage: Waste or resource? A historical perspective. *Environment: Science and Policy for Sustainable Development*, 22(8), 16-42.
- Lazarova V., Levine B., Sack J., Cirelli G., Jeffrey P., Muntau H., Salgot M., and Brissaud F. (2001). Role of water reuse for enhancing integrated water management in Europe and Mediterranean countries. *Water Science and Technology*, 43(10), 25-33.
- Lazarova V., and Brissaud F. (2007). Intérêt, bénéfices et contraintes de la réutilisation des eaux usées en France. *L'eau, l'industrie, les nuisances*, (299), p. 29-39.
- Po M., Kaercher J. D. and Nancarrow B. E. (2003). Literature review of factors influencing public perceptions of water reuse, Technical report 54/03, CSIRO Land and water, Australia
- Russell S. and Lux C. (2009). Getting over yuck: moving from psychological to cultural and sociotechnical analyses of responses to water recycling. *Water Policy*, 11(1), 21-35.