

# WASTEWATER REUSE : ALTERNATIVE RESOURCE FOR AGRICULTURE IN PROVENCE?



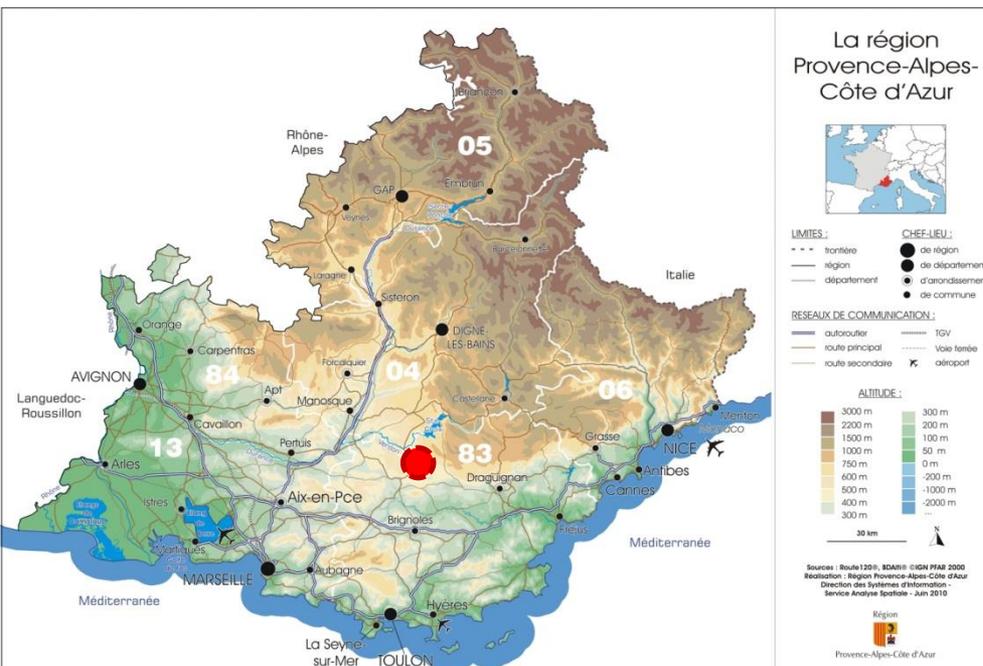
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**Main idea :** wastewater reuse (WWR) may prove locally to be a relevant answer to water scarcity, in remote areas far from conventional irrigation networks

**Two actions in a single project :**

- Assessing opportunities of agricultural WWR within the regional territory
- Testing 'on field' efficiency of a rustic low technological scheme

**Field test location :**  
Verdon regional park



→ Moissac-Bellevue (83)  
50 ha irrigable farmland, 4 farmers  
Cereals, forage, vegetable crops

→ Low water availability  
No river, no connection to regional  
hydraulic networks, no available  
relevant aquifer

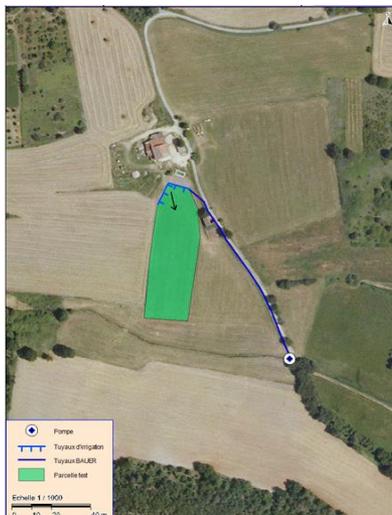
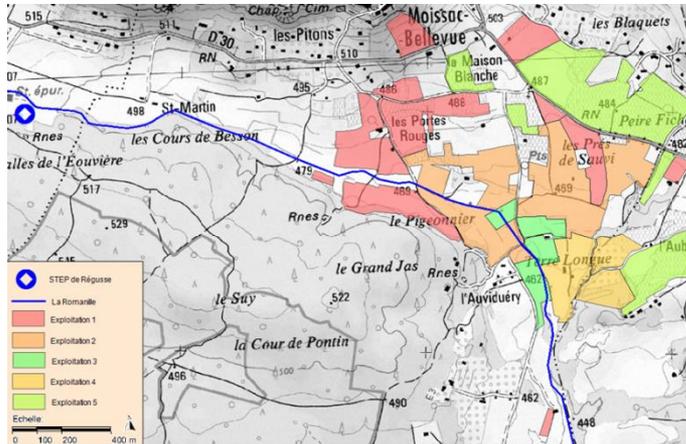
→ 4 000 people-equivalent wastewater treatment plant  
500 cum/day discharge  
1,5 km route through dry seasonal stream





# Description of the case study

Project's name	Country	City	Start Date-End Date	Water Sources	Uses
REUSE Verdon	FRANCE	Moissac-Bellevue	2012-...	Urban WWTP	Agriculture



## Sources

Origin	domestic wastewater
Water reused (m <sup>3</sup> /Y)	165 000 m <sup>3</sup>

## Uses

Crops	grassland, barley, wheat, vegetable crops
Irrigated Area (Ha)	50 ha
Cost of the Cubic meter (€/m <sup>3</sup> )	_____

## Water Reuse Chain

Treatment	Classical activated sludge, circulation in a dry stream, storage / maturation
Disinfection	Solar UV, natural oxygenation
Storage Capacity (m <sup>3</sup> )	Test : 500 m <sup>3</sup> / Project: 10 000 m <sup>3</sup>
Irrigation	Sprinkler, Surface Irrigation



**ICID2015**

26<sup>th</sup>ERC & 66<sup>th</sup>IEC

## Field test of a non technological low energy scheme



### METHODS

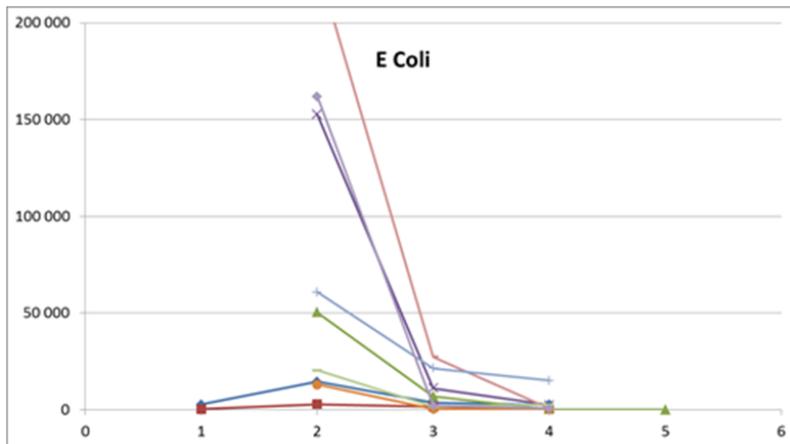
- Monitoring :
- Sanitary parameters from WWTP to farmland uses (2012 – 2015)
  - Continuous flow rate in the dry seasonal stream



- Setting up a temporary storage / lagooning basin, in order to :
- Test irrigation technique
  - Assess disinfection effect

## What practices and technologies to create effective, safe and economically viable water reuse chains ?

### RESULTS



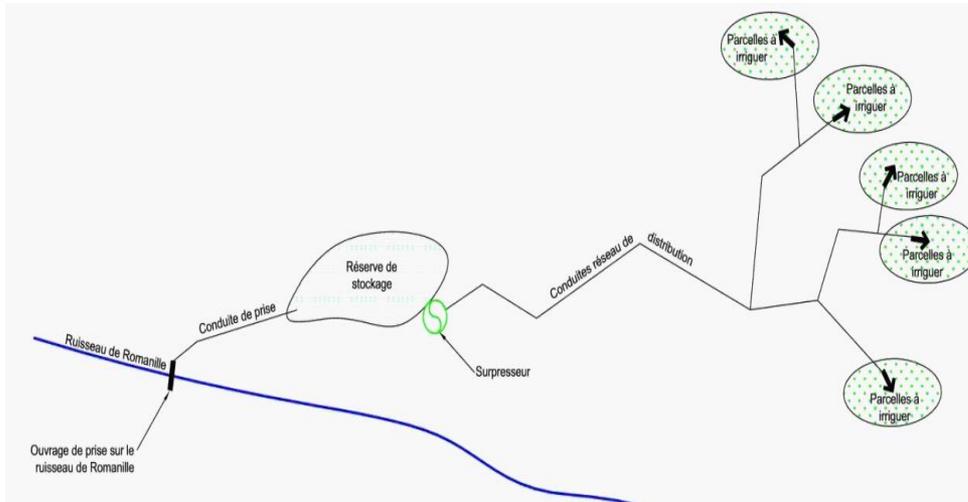
→ Regarding suspended solids, COD, E Coli and coliforms, 'B' water quality of the French regulation is maintained when water reaches the farmland

⇒ Thus a wide panel of agricultural uses is possible

→ 8 days of storage / lagooning increases water quality and allows reaching 'A' water quality

⇒ The panel of uses gets wider, and vegetable cropping is even an option

# What practices and technologies to create effective, safe and economically viable water reuse chains ?



→ A relevant and rustic hydraulic scheme can be set up, avoiding intensive additional treatment

→ 40 sites in Provence hinterland may be suitable for this type of schemes

## CONCLUSION

→ The case study applies World Health Organization multiple barrier approach, as a succession of :

- Classical activated sludge WWTP
- Course of effluent in a dry seasonal stream
- Storage / lagooning basin
- Irrigation technique

→ Further testing is required, especially regarding viral and parasitic parameters