

GOOD PRACTICE SHEET N° 6

WATER REUSE

What is water reuse?

Water reuse is the use of water which is generated from wastewater and that after the necessary treatment is of an appropriate quality for its intended use. Water reuse takes health and environmental risks as well as national and international legislation into account.



Which **impactful changes** can water reuse bring to your business model transformation?



Why should you implement water reuse?

In many water-scarce Mediterranean areas, most water is extracted from surface or groundwater. Water reuse can be a sustainable territorial lever for Integrated Water Resources Management. It provides an important reliable water source for irrigation, as well as to meet the water needs of industries and cities, as flows can be largely guaranteed.

What are the environmental and agronomic needs addressed by water reuse?



What are the economic needs addressed by water reuse?



What are the key figures for water reuse ?

AGRO-ENVIRONMENTAL IMPACTS

Irrigation and fertilization of a wide variety of crops: cereals, vegetables, fruits, meadows, citrus, fiber crops.

Water supply for large agricultural areas: up to 23,000 ha in Israel or 25,000 ha in Italy via a single water reuse system.

Single water reuse systems allowing **a gain in drinking water of more than 50 million m³/year** (Italy, Greece, Spain) **or even more than 100 million m³/year** (Jordan, Israel)

Direct recharge of aquifers and wetland preservation in water stressed areas: 3 million m³/year for Ezousa aquifer recharge in Cyprus and 15 million m³/year for wetland preservation in Spain.

SOCIAL IMPACTS

Maintaining and creating jobs on local and national scales: more than 20,000 jobs created and preserved in Jordan and more than 100,000 in Israel from water reuse projects. **The EU water sector includes 9,000 active SMEs employing almost 500,000 people.**

1 Wastewater collection from major water sources



Rainwater



Process wastewater



Sewage water

2 Wastewater treatment into Reuse systems

Common wastewater filtration

3 Major treated water uses



Irrigation*



Rinsing water

Adapted treatment to the collected water's sources and to the destination of the treated water uses

ECONOMIC IMPACTS

Economic benefits for farmers with more than 50% reduction of water bill. In Cyprus, reused treated water is supplied for irrigation uses for 33% of the price of fresh water.

An average added value for farmers estimated between **1.12 and 1.66€/m³** of water (examples in Jordan and France).

A potential value of about **346 million of euros** for unexploited phosphate in Europe's wastewater.

An estimated net profit of over 5 million euros for farmers (from a water reuse project in France).

POTENTIAL DEVELOPMENT

More than 40 billion m³ of wastewater are treated in the EU every year, but **only 2,4% of treated wastewater is reused** (and less than 0.5% of annual EU freshwater withdrawals). **Europe could reuse 6 times the volume of treated water that is currently reused.**

*Irrigation is the most regulated use in the Mediterranean basin and the only one in most of its countries

How to implement a water reuse system?

ON-FARM ISSUES

- 1 Water shortages
- 2 Loss of agricultural production
- 3 Competition for water resources
- 4 Strong impact of untreated water
- 5 Degradation of groundwater

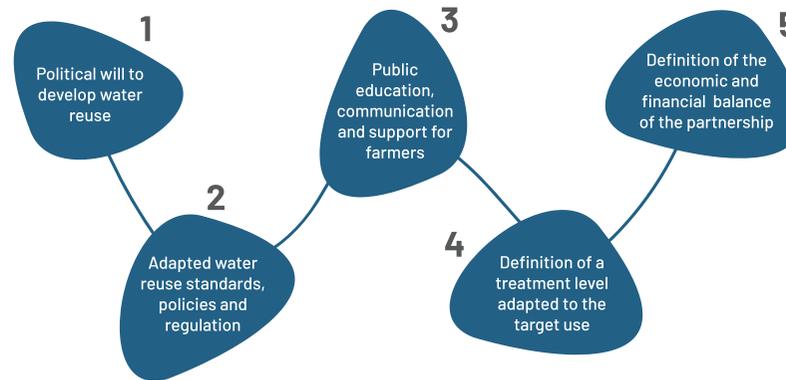
FIELD ADVICE

"To avoid the risk of water shortages, the reuse of treated wastewater is one of the best solutions to secure access to water. Once treated, category A wastewater, as defined by French regulations, can be used for irrigation of green spaces or crops, firefighting, industrial needs or urban development and cooling.

Today, wastewater reuse remains an underexploited solution. Only 0.2% in France, compared with 8% in Italy, 14% in Spain and more than 80% in Israel. Reuse is one of the rational responses to the water shortages that will continue to recur as a result of the climatic disruptions that our planet is experiencing and that affect the daily lives of citizens and local economic players alike."

Géraud Gamby - Water Market Manager - Veolia Water France - Development Department

KEY STEPS TO A SUCCESSFUL IMPLEMENTATION



IMPACTS AND BENEFITS

- 1 Supply of reliable, accessible and free water
- 2 Fertilizing value
- 3 Increase in available water resources and reduction of water bill
- 4 Improvement of water quality and biodiversity levels
- 5 Reduction of abstraction from surface and groundwaters

KEY CHALLENGES

Costs of infrastructure

One of the major challenges of reuse is related to the **high costs of infrastructure and operation**, which requires external financing from private or public partners.

Social and legislative context

The **social and legislative context** will strongly condition the success of a water reuse project. The lack of regulations and incentives for water reuse in the Mediterranean basin is currently a major limit to its development. The social acceptance of reuse, in particular for the irrigation of agricultural products, will also strongly impact the viability of the project.

How to go further?



MORE INFORMATION DOCUMENTS AND DATA

FAO, The Wealth of Waste: the Economics of Wastewater Use in Agriculture. 2010, Food Agricultural Organisation. p. 129.

Hidalgo, D. and R. Irusta. The cost of wastewater reclamation and reuse in agricultural production in the Mediterranean countries. in IWA Conference on Water Economics, Statistics and Finance, Rethymo. 2005. Greece.

Kramer, et al., EMWater guide: improving wastewater treatment and reuse practices in the Mediterranean countries - A practical guide for decision-makers. 2007.

Lazarova, V., Asano, T., Bahri, A., Anderson, J. (Eds.), Milestones in Water Reuse: the Best Success Stories. 2013, 1. publ. ed. IWA Publishing, London

Mediterranean Wastewater Reuse Working Group, Mediterranean Wastewater Reuse Report. 2007, EU water initiative/WFD process. p. 50.



DISCUSS AND TEST PROJECTS, TOOLS AND NETWORKS

HotSpotReuse® is a worldwide collaborative platform for developing water reuse projects, managed by Ecofilae. It lists and characterizes reuse projects developed around the world. <https://www.hotspotreuse.com/>

MAGO (2021 – 2024) is a 3-year PRIMA-funded project that aims to develop Mediterranean water management solutions for a sustainable agriculture supplied via an online collaborative platform. It will enhance monitoring and modeling for better water use efficiency and soil conservation and improve planning and operation of wastewater reuse systems in agriculture. <https://www.mago-prima.eu/>

DEMOWARE project (2014–2016) on Innovation Demonstration for a Competitive and Innovative European Water Reuse Sector. <http://demoware.eu/en>

Water4Crops project (2 0 1 2 - 2 0 1 6) : “Integrating biotreated wastewater reuse and valorization with enhanced water use efficiency (WEF) to support the Green Economy in EU and India”. <http://water4crops.org/>



TAKE ACTION FUNDING SOURCES

European Agricultural Fund for Rural Development (EAFRD). The “second pillar” of the Common Agricultural Policy (CAP) complements the system of direct payments to farmers. The Fund focuses on agriculture, forestry, environment and quality of life in rural areas. EAFRD resources can be used to finance water reuse infrastructures in agriculture.

Horizon Europe. The biggest EU Research and Innovation program with nearly €95 billion of funding available over 7 years (2021 to 2027). The program includes a specific section on climate action, environment, resource efficiency and raw material which can be relevant for research in the water reuse field.

Water Europe is the European Technology Platform for Water, initiated by the European Commission in 2004 as an industry-led stakeholder forum. Water Europe has developed different Programs which are key to the objectives and implementation of the Water Europe strategy: “Collaboration and Working Groups Program” to foster collaborative initiatives between members and “The Investor Program” to facilitate the growth of investment in the sector.