



Integrated Wastewater Management in Jordan

In view of climate change, a dynamic population development and increasing refugee influx, efficient water management has become an existential challenge, especially for arid and semi-arid regions. Jordan is one of the world's most water scarce countries, where groundwater resources are indispensable for water supply.

Jordan is striving to set a regional example of a successful implementation of IWRM concepts and it is expected that it will be the reference case for IWRM knowledge, methods, and application in the Middle East.

The implementation of IWRM concepts will help to mitigate extreme water scarcity and protect groundwater resources in Jordan. The Jordanian Ministry of Water and Irrigation has identified the treatment and reuse of wastewater as an essential component of IWRM and Jordan's water strategy.

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Ministry of Water and Irrigation



Competence Facility for Decentralized Wastewater Management



Sustainable Management of Available Water Resources with Innovative Technologies (SMART)

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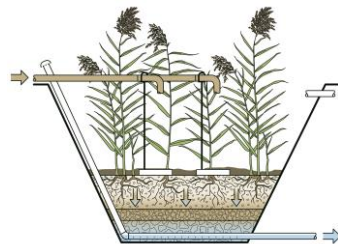
Within the framework of the SMART project, the Fuheis Demonstration, Research and Training Facility started its operation in autumn 2009. It demonstrates various approaches for sustainable integrated wastewater treatment and reuse.

Different wastewater treatment systems were installed, as well as an onsite laboratory. The treatment systems are operated with raw wastewater and were further developed and adapted to the Jordanian conditions.

The aim is to demonstrate the robustness of the technologies, their low operation and maintenance requirements as well as the possibility to provide effluent qualities that meet the Jordanian standards for the reuse of treated wastewater.

French Design

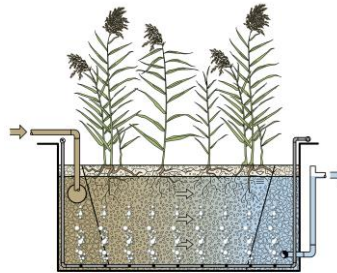
- Combines sludge & wastewater treatment
- Raw wastewater applied directly to one filter at a time
- Alternating operation allows sludge to turn into compost.



The Fuheis Demonstration, Research and Training Facility is unique. It allows for direct comparison of technologies under the same climate and wastewater conditions.

Aerated Design

- Combined secondary treatment & disinfection
- Saturated operation
- Air pump provides oxygen & mixing for increased treatment
- Low maintenance requirements



The wastewater treatment technologies at the site include the following technologies:

- Sequencing- and Continuous- Batch Reactors (SBR, CBR)
- Traditional and Modified Septic Tanks (MST)
- Membrane Bioreactor (MBR)
- Sludge Dewatering Reed Bed
- Anaerobic Bioreactors
- Ecotechnologies: Vertical Flow Treatment Wetlands, Aerated and French Design.

Research at the facility focuses on (i) technology optimization; (ii) nutrient recycling; (iii) pathogen removal; (iv) wastewater reuse; (v) sludge management & groundwater recharge.

Agricultural and garden plots are dedicated to study the reuse of treated wastewater. The test plots are planted with lemon trees that are commonly produced in Jordan and have relatively high irrigation requirements. Small garden plots demonstrate further possible ways to use treated wastewater at a household level.

Furthermore, the facility serves as Training and Capacity Development platform. It is used by students to conduct their PhD, Master and Bachelor studies or to gain further qualified training. Ministries, local companies, donors and further interested parties use the facility to increase their knowledge on the different wastewater treatment systems installed, including their operation and maintenance requirements.

