



PROMOTING DECENTRALISED WASTEWATER TREATMENT & REUSE IN PERI-URBAN JORDAN

LESSONS LEARNED & POLICY RECOMMENDATIONS

The Sustain Water MED project demonstrated the potential of decentralised wastewater treatment and on-site effluent reuse for irrigation of green areas in peri-urban areas. The project, however, also uncovered significant challenges in implementation. Building on the project's experience, this policy brief provides lessons learned and policy recommendations on how to further facilitate realisation of decentralised wastewater treatment and reuse projects in Jordan.

LESSONS LEARNED

- 💡 Decentralised systems can be beneficially deployed for wastewater treatment in peri-urban areas.
- 💡 Combining decentralised wastewater treatment in urban areas with safe reuse of effluents for irrigation can create noticeable environmental and economic benefits.
- 💡 The project activities contribute to realisation of the national water strategy objectives towards the utilisation of non-conventional water resources. Close coordination with multiple stakeholders, including national ministries, as well as outreach to the public, facilitated project implementation and support long-term impact.

POLICY RECOMMENDATIONS

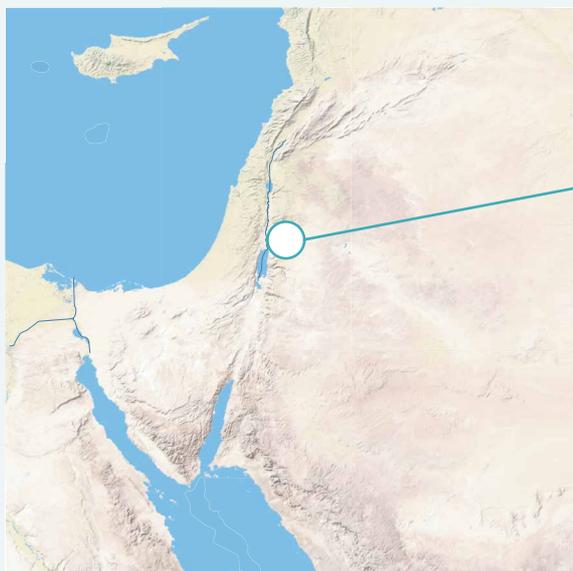
- 🚩 Promote simplified, less cost- and time-intensive procedures for small-scale wastewater projects.
- 🚩 Define a uniform procedure and a clear distribution of responsibilities for water quality monitoring.
- 🚩 Strengthen the role and capacities of decentralised entities.
- 🚩 Review the existing legislation on effluent quality requirements for use of reclaimed water.

BACKGROUND

Jordan is one of the most water-scarce countries in the world. Insufficient wastewater treatment is further threatening the quality of existing water resources, especially groundwater resources. Acknowledging these challenges, the national water strategy promotes decentralised wastewater treatment and use of reclaimed water for irrigation. In order to achieve these goals of the national water strategy, more practical experience needs to be gained in Jordan. Against this backdrop, the Sustain Water MED project aimed to demonstrate the benefits of decentralised wastewater treatment and reuse in a pilot project implemented at the newly built Public Security Directorate (PSD) in Moqablane, a peri-urban area of Amman.

With the expansion of the PSD compound, Sustain Water MED partners built an on-site wastewater treatment plant and established a reuse scheme to use treated effluent for irrigation purposes within the premises of the PSD. The excess reclaimed water will be shared with the Greater Amman Municipality (GAM) for their irrigation purposes. The technology applied at the pilot location is the Sequencing Batch Reactor (SBR). The SBR-based unit was further complemented by a sand filter as tertiary treatment to meet relevant water reuse standards.

LOCATION OF THE SITE IN JORDAN



Filtration unit of the SBR.

Source Map: Made with Natural Earth, 2015.
Source Picture: GIZ

LOCATION: *Public Security Directorate (PSD), Moqablane, Amman, Jordan*

WASTEWATER TREATMENT: *On-site treatment of up to 150 m³ per day using a Sequencing Batch Reactor (SBR) followed by sand filtration and disinfection*

REUSE APPLICATION: *Landscape irrigation, reusing up to 100 % of treated effluents in summertime, thus saving up to 4,378 m³ per month or 52,536 m³ per year of freshwater*

COSTS: *Investment: 332,000 JOD for the treatment plant, 35,000 JOD for the irrigation system; Running costs: 0.86 JOD per m³ (incl. electricity, operation and maintenance, spare parts)*

LESSONS LEARNED

Decentralised systems can be beneficially deployed for wastewater treatment in peri-urban areas.

The system implemented in the Sustain Water MED project proved that decentralised systems can maintain health and environmental standards while providing the advantages of simple operation and maintenance (O&M), a small footprint, and flexibility regarding scale-up and extension. Project experiences underlined the importance of existing local expertise for design, construction, and O&M of the chosen treatment systems. Further capacity development is needed for private sector and other stakeholders in the O&M of decentralised wastewater treatment plants.

Combining decentralised wastewater treatment in urban areas with safe reuse of effluents for irrigation can create noticeable environmental and economic benefits.

On comparison, running costs for the decentralised treatment plant built at the PSD are lower than costs related to the current practice, i.e. costs for the emptying of cesspools and trucking of liquid wastes to the nearest treatment plant. In addition, reusing effluent instead of freshwater provided by tankers for irrigating 34,000 m² of green area at the PSD premises is expected to save approx. 5,000 JOD per month. Additional savings in freshwater costs will accrue at the GAM if effluent from the PSD plant is used for irrigation purposes. Investment costs will thus pay off in a reasonably short time period. Moreover, using reclaimed water for irrigation purposes alleviates the stress on Jordan's scarce freshwater resources, while decentralised wastewater treatment reduces the risk of groundwater pollution connected to the widespread use of cesspools.

The project activities contribute to realisation of the national water strategy objectives towards the utilisation of non-conventional water resources. Close coordination with multiple stakeholders, including national ministries, as well as outreach to the public, facilitated project implementation and support long-term impact.

With the demonstration garden that has been constructed as part of the Sustain Water MED project activities at the PSD, as well as through cooperation with other initiatives such as the SMART project's demonstration and test site for decentralised wastewater treatment and reuse at Fuhais, Jordan, the project further contributes to the public promotion of safe reuse of wastewater and ultimately to sustainable development in Jordan.

POLICY RECOMMENDATIONS

The Sustain Water MED project in Jordan successfully demonstrated tangible benefits of decentralised reuse-oriented approaches for wastewater management. Nevertheless, the project partners faced several challenges in implementing the project. In support of Jordan's National Water Strategy, the following recommendations should be taken into account:

Promote simplified, less cost- and time-intensive procedures for small-scale wastewater projects.

Jordanian regulations currently require a fully-fledged Environmental Impact Assessment (EIA) for all types of wastewater treatment plants. In view of the national strategy to promote decentralised wastewater management, simplified procedures should be established for small scale projects.

Define a uniform procedure and a clear distribution of responsibilities for water quality monitoring.

Responsibilities for monitoring effluent quality at decentralised treatment plants currently overlap. In order to facilitate implementation of decentralised wastewater treatment and reuse, responsibilities need to be clarified, and consistent requirements and procedures should apply.

Strengthen the role and capacities of decentralised entities.

Responsibilities for permission, EIA approval and monitoring of decentralised wastewater management projects currently lie with national authorities. In order to facilitate procedures and to encourage implementation of decentralised plants, authorities and entities at governorate level should receive more responsibilities and their capacities should be strengthened to take an active role in promoting decentralised reuse-oriented wastewater management in Jordan. The National Implementation Committee for Effective Decentralised Wastewater Management (NICE) under the leadership and supervision of the Ministry of Water and Irrigation could provide a suitable body to coordinate efforts across the country and avoid duplication and conflicts.

Review the existing legislation on effluent quality requirements for use of reclaimed water.

The Jordanian standard (JS 893 2006) requires high effluent quality standards, which are in some cases prohibitive for the application of decentralised treatment systems. In particular, the required nitrate concentration is overly strict and should be revised in order to facilitate reuse of effluents.



Workers on future green area in front of the PSD in Moqablane, Amman.

Source: GIZ

COORDINATION & CONTACT

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THE PROJECT

The SWIM Sustain Water MED project involves a network of demonstration activities for sustainable integrated wastewater management and reuse in Jordan, Egypt, Tunisia and Morocco. The project is part of the Sustainable Water Integrated Management (SWIM) Programme, a regional technical assistance programme funded by the European Commission to contribute to the extensive dissemination and effective implementation of sustainable water management policies and practices in the Southern Mediterranean Region. Sustain Water MED is co-funded by the German Federal Ministry for Economic Cooperation and Development (BMZ) and implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH together with seven national, regional and European partners. For more information see www.swim-sustain-water.eu.

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This policy brief was compiled by adelphi based on project reports and experience gained by the Sustain Water MED partners in Jordan: Al-Balqa' Applied University (BAU), International Union for the Conservation of Nature (IUCN), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. This publication has been produced with the financial assistance of the European Union and the German Federal Ministry for Economic Cooperation and development (BMZ). The views expressed herein can in no way be taken to reflect the official opinion of the European Union.