



# PROMOTING DECENTRALISED WASTEWATER TREATMENT IN RURAL AREAS IN EGYPT

## LESSONS LEARNED & POLICY RECOMMENDATIONS

The Sustain Water MED project demonstrated the potential for decentralised wastewater treatment in a rural area of the Nile Delta in Egypt. The project, however, also uncovered significant challenges in implementation. This policy brief provides lessons learned and policy recommendations on how to further facilitate realisation of decentralised wastewater treatment projects in rural areas in Egypt.

### LESSONS LEARNED

- 💡 Decentralised treatment of wastewater is a reliable alternative to centralised sanitation systems in rural areas in Egypt.
- 💡 Besides considerably improving local sanitary conditions, implementing a decentralised wastewater treatment scheme also provides economic benefits for the local population.
- 💡 The project successfully involved the local community, creating ownership and commitment for the new system.

### POLICY RECOMMENDATIONS

- 🚩 A Rural Sanitation Strategy needs to be developed for small towns, villages and scattered settlements with clear institutional, technical and financial frameworks.
- 🚩 Promote replication of decentralised treatment units in similar villages in order to limit environmental pollution and health risks.
- 🚩 Ensure sustainable operation and maintenance of decentralised treatment plants.
- 🚩 Develop capacities of local technology providers.

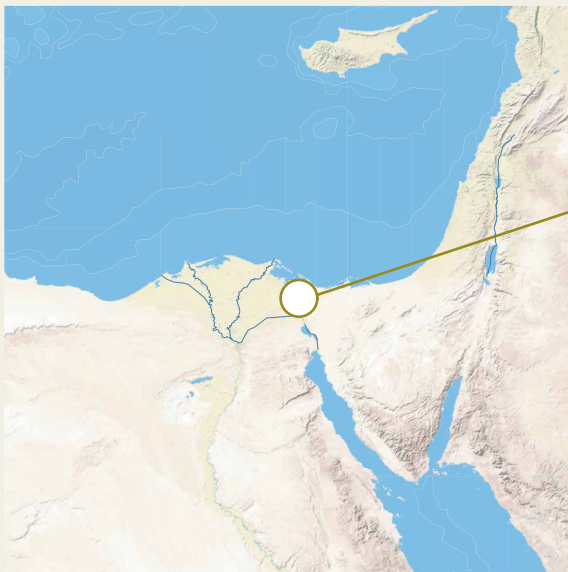
## BACKGROUND

Rural areas in Egypt and especially the region of the Nile Delta are characterised by a significant lack of sanitation compared with urban areas. This is partly due to the absence of a clear institutional framework for sanitation in rural areas, and of a national rural sanitation programme defining technical interventions and an appropriate financial framework. Potential synergies between the ministries concerned are not exploited so far and information, training and involvement of all the relevant stakeholders is lacking. The common sewage disposal system mainly based on soak away latrines often does not work properly due to the high groundwater table, infrequent emptying and cracks in the walls. Thus sewage leaks out and contaminates the surrounding streets, canals and groundwater. Serious environmental pollution is also caused by uncontrolled discharge of raw sewage by trucks emptying latrines and septic tanks, especially into agricultural drains. It is worth highlighting that water in drains is often used for agricultural production, forcing farmers into unsafe practices.

Acknowledging these challenges, Egypt's National Water Strategy has identified decentralised wastewater treatment as the only solution to overcome this situation. However, few decentralised treatment plants exist as yet. Against this backdrop, the Sustain Water MED project aims to demonstrate the benefits of decentralised wastewater treatment in a pilot project implemented in Al Gozayyera, a village located near Ismailia, in the Nile Delta.

The technology identified as the most suitable option for the village is a compact treatment unit applying an aerobic-anoxic activated sludge reactor. It has been chosen for its ability to ensure high treatment performance, even in the presence of hydraulic shock loads, which are typical in small communities with short sewer systems, at low-to-medium running costs.

## LOCATION OF THE SITE IN EGYPT



Construction of the compact treatment plant.

**LOCATION:** *Al Gozayyera village, Ismailia Governorate, Egypt*

**TECHNOLOGY:** *Compact aerobic-anoxic activated sludge reactor*

**INVESTMENT COSTS:** *207,621 EUR*

**AMOUNT OF WASTEWATER TREATED:** *140 m<sup>3</sup> per day*

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

## LESSONS LEARNED

### Decentralised treatment of wastewater is a reliable alternative to centralised sanitation systems in rural areas in Egypt.

The project pointed out the advantages offered by decentralised wastewater treatment with a compact unit, instead of centralised management, which is difficult and costly in rural areas. This type of decentralised solution bears huge potential for replication in the large number of remote communities in the region facing similar problems of insufficient sanitation, serious environmental pollution and exposure to potential infections, especially for the population living near the drains.

### Besides considerably improving local sanitary conditions, implementing a decentralised wastewater treatment scheme also provides economic benefits for the local population.

With the connection to the new sewerage system, washing and bathing in particular are no longer constrained due to the limitations of wastewater storage in cesspits, which must be emptied at high costs (50 to 100 EGP per month). The new decentralised sewerage and wastewater treatment system will be more economical for the inhabitants of the village. Moreover, the market value of the land may potentially rise due to better infrastructure with the sewerage connection, as well as better conditions for building structures, which were previously affected by seepage and moisture from the high level of wastewater in the trenches underneath village houses.

### The project successfully involved the local community, creating ownership and commitment for the new system.

Involving the local community development association proved helpful for assessing the urgent needs of the village population and for creating local-level support for the pilot project. Also, a new approach of cooperation between the water supplier and the beneficiaries was adopted to ensure sustainable operation and maintenance of the project technologies. This approach involved the local affiliated company (representative of the HCWW) and the village association signing a contract to clarify their respective responsibilities. The contract ensures that the decentralised setup will be maintained mainly by the local association, supported by the affiliated company for any technical challenge that the association cannot overcome.

## POLICY RECOMMENDATIONS

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

### A Rural Sanitation Strategy needs to be developed for small towns, villages and scattered settlements with clear institutional, technical and financial frameworks.

These frameworks should clarify responsibilities and enable enforcement of adapted regulation and controls. Further, a set of appropriate centralised, semi-collective and decentralised technologies should be clearly defined depending on the size of small towns, villages and scattered settlements. These technologies should be economical in terms of investment and maintenance, effective, and easy to operate and maintain. A centralised management approach should be adopted for the decentralised wastewater treatment plants, and management and business scenario(s) should be developed for sludge-to-energy and reuse of wastewater.

### 🚩 Promote replication of decentralised treatment units in similar villages in order to limit environmental pollution and health risks.

This type of decentralised treatment system bears the potential to stop the illegal discharge of untreated wastewater into agricultural drains. However, it will only reduce environmental pollution and health risks significantly if it is replicated in other villages. Aiming for a significant reduction of pathogen concentrations in agricultural drains is an urgent challenge that should be addressed by Egypt's National Water Strategy in such agricultural areas.

### 🚩 Ensure sustainable operation and maintenance of decentralised treatment plants.

Currently, the necessity of employing operators to ensure the continuous running and upkeep of the decentralised system results in high expenses for operation and maintenance (O&M) considering the small-scale application of the technology. Implementing a remote system could prove beneficial in the case of replication of the technology in other villages, as the monitoring of all the decentral treatment plants could then be managed centrally by the local affiliated company. However, it would be important to ensure that local institutions have the financial resources to cover expenses for O&M capacities and training, which need to be provided accordingly. Permitting procedures for decentral wastewater treatment systems should thus require the elaboration of an O&M plan, including responsibilities, maintenance schedules, and a clear and affordable economic and management model for long-term operation of the system.

### 🚩 Develop capacities of local technology providers.

As there is currently a lack of local providers of decentralised wastewater treatment systems in Egypt, a prefabricated unit of a type that has already proven successful for similar settings was identified as the most suitable option in the Sustain Water MED project. However, efforts to promote replication of such decentralised wastewater treatment systems need to be complemented by measures to support the national supply side. These could include capacity building measures for local technology providers and construction companies, as well as awareness-raising measures on new market opportunities emerging from these new approaches.

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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](http://www.swim-sustain-water.eu).*

#### IMPRINT & DISCLAIMER

*This policy brief was compiled by adelphi based on project reports and experience gained by the Sustain Water MED partners in Egypt: Holding Company for Water and Wastewater (HCWW), 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.*