



# How to scale-up greywater reuse in Jordan and Egypt

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Research Theme

Recovering and Reusing Resources

Solutions

Urbanization

Greywater – wastewater generated by household water use, excluding toilet water – is a potentially valuable resource. Studies show that between 50-70% of the total wastewater produced by a household can be treated and reused for irrigation, as well as for flushing toilets.

In Jordan, greywater treatment systems have been researched, designed, piloted, tweaked and disseminated over the past 17 years. Much funding and time has been invested into creating affordable, efficient and low-maintenance systems to treat greywater at the household level. But all of this research has not translated into large-scale adoption of the technology by households and smallholder farmers.

The situation is a bit different in Egypt. The country is only now investigating small-scale greywater treatment and reuse for irrigation as a way to alleviate water shortages, most notably within the water deprived governorate of Matrouh on Egypt's North coast.

Why are smallholders in Jordan not using greywater recycling technology? And what can be learned by from their experience to improve uptake in Egypt?

## Greywater reuse makes sense for dry areas

Jordan's staggering water deficit, which is the result of decades of overexploitation, has created a great deal of

tension in regional water politics. Municipal supply of water to rural households is rotational and, in many cases, is limited to once or twice a week. Rural households seek alternative methods for securing water for sanitation and irrigation, such as purchasing it from private tankers, digging wells to tap into non-renewable aquifers and harvesting rainwater.

The situation is not much better in northern Egypt, a region that is very dependent on rainwater. Only 50% of the households in Matrouh are connected to the municipal water network, which is free but highly irregular. As such, the population is forced to purchase desalinated water from private vendors.

Research and successful adopters of greywater treatment have shown that reusing greywater for household use in rural and peri-urban areas can result in lower water bills, reductions in the cost of pumping septic tanks, reduced pressure on municipalities to supply potable water, and improved productivity within household gardens

## Barriers to greater adoption of greywater treatment technology

In order to understand the current challenges related to greywater use and to uncover avenues for promoting uptake across the region, [ICARDA](#), [FAO](#) and WLE organized a multi-stakeholder roundtable on November 7th in Amman.

One major barrier to adoption of greywater treatment technology identified by participants was odor. Despite many efforts to improve the technology to reduce foul smells, these bad odors persist and drive users to abandon the treatment systems.

Health and sanitation are also a concern, and underlie much of the rejection of treatment technology. Households are not convinced that using greywater is safe for irrigation, especially for irrigating fruit trees, and tend to only use it for olive trees.

Participants agreed that farmers and communities need compelling evidence that greywater is safe - and maybe even government endorsement of greywater use - to be swayed. Some government ministries are afraid of potential disease outbreaks related to incorrect use of greywater treatment technology, which could jeopardize the growing international market for Jordanian agricultural produce.

There is currently no legislation in Jordan regulating the use of greywater, only recommendations, which does not help build confidence.

Not only is there limited government support, there are also cultural and religious taboos that make uptake difficult.

In Matrouh, ICARDA and the [Desert Research Center \(DRC\)](#) struggled to find households willing to try out the technology to irrigate crops. “There were two issues at stake,” recounted Arabi Mansour from DRC. “The first was psychological, since most people found the idea of using treated household wastewater disturbing; the second was religious, since the practice was perceived as haram [forbidden by Islamic law].” Presenting some fatwas (rulings on Islamic law) on the use of greywater in the region from the late 80s has helped a bit in the adoption of the technology, both in Jordan and Egypt.

Finally, the cost of the technology is prohibitively expensive. At 800-1,500JOD (about 1,100-2,100USD) depending on the system, the treatment systems are unaffordable for those identified as the primary beneficiaries, i.e. smallholder farmers and the rural households. [Mercy Corps](#) has only managed uptake of the technology in Jordan because it worked to establish of a system of revolving loans with local CBOs.

“What we see in Jordan is that the adoption of greywater treatment systems has only been done through foreign funding,” said Dr. Sireen Naoum from [NCARE](#). “Until the Ministry of Water and Irrigation communicates clear instructions regulating the use of greywater and works alongside the international organizations, there cannot be a scale-up.”

## Channels for further uptake

Participants agreed that, to enable broader uptake, governments within the region need to include greywater within their national water strategies and clearly distinguish it from blackwater (sewage). Regulatory frameworks and government approval of the technology would also help.

Other ideas included getting organic certification standards in place for commodities produced with greywater, especially in Matrouh, where organic figs are produced for export.

There was also a suggestion that research be done on using greywater to enhance green spaces, schools or mosques. If

governments were able to invest in the technology for use in these more public spaces, they could help instill a sense of confidence in the treatment systems and demonstrate how greywater could be useful in beautifying these arid regions.

Greywater treatment technology still needs to be improved in order to minimize maintenance and ensure standard water quality, while social systems need to be further researched to better understand barriers to uptake. “You can't force the farmer to use grey-water against his will,” said Arabi Mansour. “But if you manage to persuade one influential member of the community of the benefits of greywater, then you'll see a broad adoption of the technology.”

## RELATED PROJECTS

### PROJECT

JANUARY - DECEMBER 01, 2015

[A framework for analyzing the impacts of treated, partially treated or untreated wastewater use in agriculture](#)


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Jeff Smith

**Lead Partner:** International Water Management Institute (IWMI)

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## R E L A T E D P U B L I C A T I O N S

### REPORT

2 0 1 6

#### The role of private sector in city region food systems

Dubbeling, M.; Carey, J.; Hochberg, K. 2016. The role of private sector in city region food systems. AK, Leusden, The Netherlands: RUAF Foundation, 120p. [www.joycarey.co.uk](http://www.joycarey.co.uk)

### BROCHURE

2 0 1 6

#### Resource recovery and reuse report series

CGIAR Research Program on Water, Land and Ecosystems (WLE). 2016. Resource recovery and reuse report series. Colombo, Sri Lanka: CGIAR Research Program on Water, Land and Ecosystems (WLE). 2p.

### BOOK CHAPTER

2 0 1 4

#### Gender Issues in Watershed Management. In Gender Issues in Water and Sanitation Programmes: Lessons from India

Wani SP, Anantha KH, TK Sreedevi. 2014. Gender Issues in Watershed Management. IN: Cronin AA, Mehta PK and Prakash A. (Eds.), Gender Issues in Water and Sanitation Programmes: Lessons from India. India: Sage. pp: 99-119.

### CONFERENCE PAPER

2 0 1 1

#### Community-based use of grey-water in home farming

Al-Balawenah, A.; Al-Karadsheh, E.; Qadir, M. 2012. Community-based use of grey-water in home farming. Paper presented at the International Conference on Food Security and Climate Change in the Dry Areas, 1-4 February 2010, Amman, Jordan. pp.299-303.

### CONFERENCE PAPER

2 0 1 2

#### Safe wastewater reuse: a call for sanitation safety plans.

Cisse, G.; Drechsel, Pay. 2012. Safe wastewater reuse: a call for sanitation safety plans. [Presented at the Workshop on Health and Food Security]. [Abstract only]. In Stockholm International Water Institute (SIWI). Water and food security. Abstract volume, World Water Week in Stockholm, Sweden, 26-31 August 2012. Stockholm, Sweden: Stockholm International Water Institute (SIWI). pp.152.

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