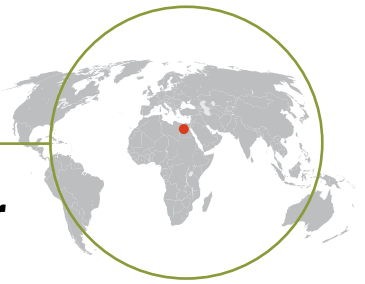
CASE STUDY 3 EXTENDED



Reuse of nutrient-rich agricultural drainage water for food self-sufficiency in Fayoum, Egypt

Fayoum Governorate, Egypt, ongoing project funded by the Water and Development Partnership Programme, the Ministry of Foreign Affairs, Kingdom of the Netherlands

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Summary

Fayoum Governorate is a large depression in Egypt's western desert, located 90 kilometres south-west of Cairo. With a 22.5 per cent urbanization rate and a poverty rate of more than 60 per cent, the majority of Fayoum residents live in underserved rural areas. Fayoum is near the downstream end of the Nile system, where the only source of fresh water is the Bahr Youssef canal, 80 per cent of which is used for agriculture. More than 78 per cent of Fayoum's farms are considered to be small, with many practising subsistence agriculture.

Egypt has an annual rainfall of less than 80 millimetres. As a result of a limited freshwater supply and prolonged drought in Fayoum and elsewhere in Egypt, successive governments have relied on drainage water reuse to reduce the water supply-demand gap in agriculture. Agriculture drainage water is a mixture of treated domestic wastewater and agricultural wastewater. In some locations it receives an illegal discharge of domestic wastewater and sometimes industrial wastewater.

The policy to encourage reuse has enabled Egypt to sustain the agricultural activities in the valley and delta for decades, including in Fayoum. However, such a policy risks adverse health, as well as social and ecological consequences, due to emerging contaminants from industrialization, excessive consumption of pesticides, and pharmaceutical products for human or animal use.

The response

The challenges related to emerging contaminants in agricultural drainage water reuse in the target area will be tackled with a project entitled "Reuse of nutrient-rich treated wastewater for a food self-sufficiency in the Middle East and North Africa (MENA): Addressing health concerns of emerging contaminants of small-scale farmers through agroecological tools", funded by the Water and Development Partnership Programme of the Ministry of Foreign Affairs, Kingdom of the Netherlands. This project is led by IHE Delft Institute for Water Education, based in the Netherlands. The project targets three countries: Egypt (Fayoum Governorate), Jordan (Wadi Shuaib) and Iraq (Basra Governorate).

The overall goal of this project is to investigate the efficacy of agroecological interventions for improving safe agricultural drainage water reuse for water and food security in Fayoum, while also considering health, social and environmental sustainability aspects. During the project, the agroecological interventions will be piloted as decentralized on-farm-level solutions that will be evaluated throughout the project.

The project will conduct socioeconomic and institutional assessments to understand how the agricultural drainage water is accessed, reused, managed and distributed across relevant social factors. The loads of emerging contaminants will be assessed in the agriculture drainage water, the soil and the crops. The project will design and implement plans for greater safe uptake of agroecological interventions through a participatory stakeholder process involving the local community, as well as developing a regional strategy with policy recommendations based on the experience of the project. Last but not least, the project will facilitate the co-creation and knowledge exchange at the local and regional levels, as well as the dissemination of project stories.

Partnerships and support

The IHE Delft Water and Development Partnership Programme, financed by the Dutch Ministry of Foreign Affairs, provided support for this "SafeAgroMENA" project. The project partners in Egypt are Benaa Foundation (NGO), Nile University (research and education) and Organic Valley (NGO). The project duration is 4 years, with funding for the three countries of EUR 1.5 million and co-funds from partner organizations of EUR 375,000 in the three target countries. The ownership of the developed interventions is planned to be transferred to the small-scale farmers.

Results, accomplishments and outcomes

The project started in October 2022 and, as at the time of writing, will last for 4 years. The project aims to contribute to the improvement of the quality of irrigation water in the Fayoum Governorate. As the project employs a participatory approach, farmers will be engaged to develop and implement improvement plans. Through the dialogues with policymakers and decision makers, the project will support the adoption of improved standards for reusing agricultural drainage water. The project will also empower local champions in safe reuse practices in agriculture through capacity-building sessions, a professional diploma programme and training of trainer sessions. It is envisaged that the project will enable local and regional exchange for knowledge, experiences, skills and tools for the replication of safe reuse practices.

Challenges

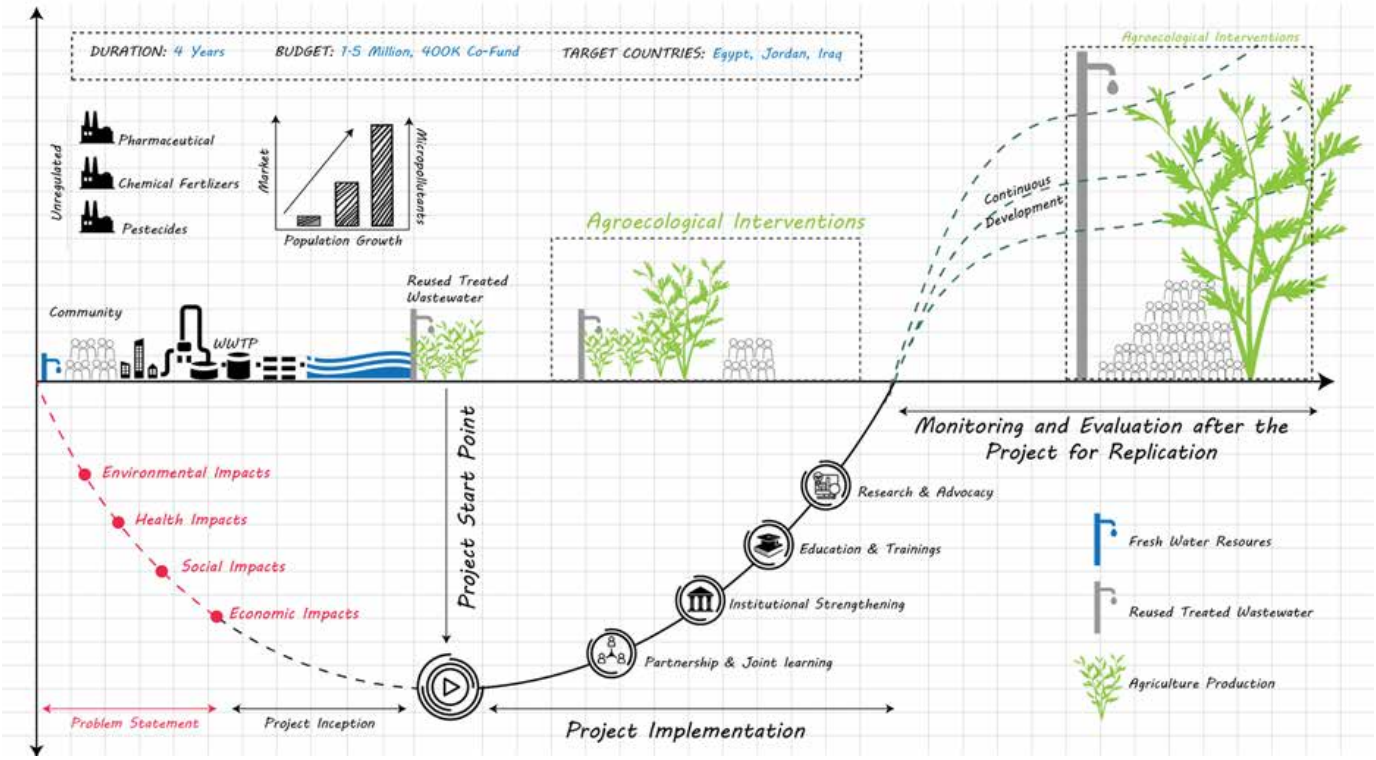
Two key challenges can be identified:

1. The deterioration of the agriculture drainage water quality and its socioeconomic impacts on farmers' livelihoods and the broader food security in Egypt.

There is a deteriorating quality of the water in agriculture drainage. That is why this project was developed based on a bottom-up and participatory approach, to ensure that the community and small-scale farmers are involved from the early stage, the knowledge is co-created and the agroecological interventions are fulfilling the demands and will sustain accordingly.

Reuse of nutrient-rich treated wastewater for food self-sufficiency in the Middle East and North Africa

Addressing health concerns of emerging contaminants to small-scale farmers through the use of agroecological tools



Source: DUPC 2022

Figure 1: *Reuse of nutrient-rich treated wastewater for a food self-sufficiency in MENA.*

2. The need to strengthen the enabling environment for the agroecological intervention and increase ownership.

Policy, regulation and investment are developed and directed for a centralized approach. So, for this decentralized agroecological intervention, there is a new ministerial committee to facilitate the development of small-scale wastewater treatment units to serve rural communities. This committee brings together the Ministry of Housing, Utilities and Urban Communities, the holding company for water and wastewater and the National Organization for Potable Water and Sanitary Drainage, as well as the rural communities themselves, as active stakeholders in the implementation of those units. Through a participatory approach, this committee aims to expand wastewater treatment and improve water quality in drains.

Opportunities for replication and scaling

There is a potential opportunity for replication for all small-scale farmers that have agriculture fields less than one feddan.