EcoFuture Pilot Demonstration in Palestine

Descriptive Summary

The Palestinian Pilot focuses on the reuse of wastewater for irrigation using an off grid solar powered wastewater treatment facility. The water will be treated to the level for agricultural water use. In addition, an existing desalination unit that has not been operational for the past 8-10 years will be upgraded. Desalinization of local groundwater mixed with the treated wastewater will increase the amount of water available for agriculture and enable farmers to produce cash crops in greenhouses, increasing local food supplies.

Background

Sixty-five percent of the Palestinian residents of the West Bank have no centralised sewage system. Wastewater from residences, especially in rural areas is collected in underground cesspits which leak into the ground water. Palestinian farmers in the Jordan Valley face two challenges, an ever-decreasing supply of water from springs and aquifers for farming and the increase in salinity of the aquifers making the water inappropriate for many traditional cash crops (vegetables). The other challenge that the farmers face is the high cost and unreliability of electricity.

Aims and Goals

The objective of the Palestinian pilot is to use decentralized wastewater treatment technologies together with desalinated groundwater to increase the amount of water available for agriculture and enable farmers to produce cash crops in greenhouses, increasing local food supplies. The power needed to run the treatment unit and the desalination system will be supplied through renewable energy. The pilot will prevent groundwater degradation, providing water for agriculture, and utilizing solar energy are good examples of a WEFE nexus.

Actions taken

Damour for Community Development is developing an environmental research center in Al Auja just north of Jericho to study ways to improve agricultural output in the Jordan Valley. The pilot is located near the research station, in one of the adjacent farms and will entail an off-grid wastewater treatment system to treat 25 m3 per day of wastewater to agricultural level use according to the Ministry of Agricultural standards. Ground water is also desalinated to less than 1,000 ppm enabling its use in cash crops. The water will then be divided and used for two crop experiments. Some water will be used to irrigate date trees, and the rest will be used in a climate controlled green house for cash crops. All technology will be powered by solar panels. Due to the hesitancy of Palestinian farmers to use wastewater for cash crops, the pilot demonstration site will also act as an educational center to promote wastewater treatment and reuse through training programs and workshops.

Main Achievement to date

The Palestinian Pilot is being constructed in Marj Naje. Marj Najeh is a Palestinian village in the Jericho Governorate located 34.8km north of Jericho City. Marj Najeh, a village of approximately 800 people, lacks a proper sanitary sewage system. Instead, residents are forced to rely on primitive methods for waste disposal, such as cesspits, increasing the risk of disease and groundwater contamination. In addition, the village is economically dependent on agricultural and due to Israeli control of water resources and the increased impact of climate change on precipitation in the region, water for agriculture is scarce. The current water supply comes from wells which are highly saline and can no longer support cash crops.
The general outline of the pilot will be to lay a main sewage line, which residents of a specific neighborhood will be able to connect from their homes. The sewage line will convey sewage from the neighborhood under route 90 through an existing pipeline to avoid the need for permission from the Israeli authorities. The wastewater will be treated in an off grid solar powered 10 CM/d wastewater treatment facility developed by the Arava Institute. The water will be treated to the level of agricultural water according to Israeli standards and then used for irrigation.
The whole construction and operation will be completed in the next two months. This demonstrator will be updated as data becomes available.

Partners

DCD TUC

Lessons, replicability and scalability potential

The Marj Naje pilot demonstrates the nexus between water, energy, food security and environmental services. The focus of the pilot is to turn wastewater which is polluting the groundwater due to a lack of centralized sewage, into agricultural water. Desalinization of local groundwater mixed with the treated wastewater will increase the amount of water available for agriculture and enable farmers to produce cash crops in greenhouses, increasing local food supplies. The power needed to run the waste water treatment plant, and the desalination pump will be supplied through clean solar energy. Preventing groundwater degradation, providing water for agriculture, and utilizing solar energy are good examples of a WEFE nexus.
The technologies used in this demonstrator can be upscaled in the other aquafarms in the Jordan valley and can be used as prototypes for the whole Mediterranean region.

Affiliation

Damour for Community Development

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WEFE PRIMA wastewater reuse agriculture Palestine Jordan Valley

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Acknowledgement of funding source
PRIMA

Total funding
100 - 500k €

Environmental
High

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Medium-High

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Medium

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