Methods for Irrigation and Agriculture
لتطوير أساليب الري والزراعة

Decentralized Wastewater Treatment and Reuse in Institutions: Mafraq Pilot in 3 Schools

July. 1, 2019 – July. 31, 2019
RFP#: WASH/JOR/PCA2018178/PD2018188/2018/MIRRA/Mafraq

Eighth Progress Report

July 1st 2019–July 31st 2019

PROJECT FACT SHEET

PROJECT TITLE: Decentralized wastewater treatment and reuse in institutions

FUNDING AGENCY: The United Nations International Children's Emergency Fund (UNICEF)

START DATE: December 1st, 2018

END DATE: September 30th, 2019

IMPLEMENTING PARTNER IN JORDAN:

Methods for Irrigation and Agriculture (MIRRA) - a Jordanian non-governmental organization that specializes in the development of water and agricultural sectors including optimizing pressurized irrigation networks at the field and network levels, wastewater reuse in agriculture and capacity-building activities for individuals and institutions.

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Contents

General Information	
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Project Code & Title:	WASH/JOR/PCA2018178/PD2018188/2018/MIRRA/Mafraq
Responsible Officer(s):	Alham Al-Shurafat
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Section One: Introduction

This project is a collaboration between MIRRA and UNICEF that works within the framework of decentralizing most of the services in Jordan. This project focuses on sanitation and wastewater management by targeting three schools in the Irhab district within Mafraq Governorate. Irhab district has a population of 23,874 residents, of which 2,970 are Syrians. The district is an agricultural area with no sewer network coverage relying on cesspits for disposal of wastewater; Water needs for agriculture are usually met through the piped water network that is supplied for domestic use. Alternatively, water trucking for agricultural purposes from privately owned boreholes is also practiced.

The collaboration aims to pilot a new approach to wastewater treatment at a decentralized level within institutions but also for communities to achieve the following objectives:

- *Safe management of wastewater at a decentralized level to prevent groundwater pollution and to reuse water for agricultural purposes.*
- *Greywater reuse to reduce the volume of fresh water consumption*
- *Solar power as an alternative sustainable energy source for the operation of the WWT system including the operation of the irrigation network.*
- *Increase awareness between students and teachers on the importance of water conservation, environmental impacts of poor management of sanitation, and renewable energy as a sustainable source to provide energy.*

Section Two: Activities and Progress

PROGRAMME OUTPUT 1: Solar powered decentralized wastewater treatment and greywater reuse systems installed in 3 schools

Irrigation of the 256 trees that have been planted in the school

Due to high temperatures during the month of July and the unready decentralized wastewater treatment plant, MIRRA has to do an irrigation event every 5 or 6 days in the boys' schools. All the trees that have been planted can withstand drought, but since they are small in age (under four years old), we used irrigation as a precautionary measure. Irrigation was done by with the purchase of an eight-cubic meter water tank and performed by school managers and the MIRRA Team. The irrigation was done at evening just before sunset. During July, four irrigation events were done and are reported in Table 1. Regarding the girls' school, the irrigation system has already been installed. MIRRA followed-up with teachers regarding its operation, who reported that it is working very well and efficiently. The irrigation will continue until the full installation of wastewater treatment plants and the provision of the irrigation network by September 2019. Approximately 200 different trees were planted in Rehab Elementary School, Rehab Secondary School for Girls and Abdullah Bin Al Zubair School.

Table 1: Irrigation schedule of the trees in the schools during July 2019.

Day	Date	Irrigation time
Sunday	07/7/2019	2 Hours/ before sunset
Monday	15/7/2019	2 Hours/ before sunset
Saturday	20/7/2019	2 Hours/ before sunset
Saturday	27/8/2019	2 Hours/ before sunset

The continuation of the installation of the decentralized wastewater treatment plants in the schools (90% Completeness)

Work continues on-site to install the decentralized wastewater treatment plants (Figure 1) and the graywater treatment and reuse systems (Figure 2) at Rehab Secondary School for Girls, Abdullah Bin Al Zubair School and Rehab Primary School for Boys. The two sites were dug, taking into account the safety of students and the sites' surroundings. The bases were poured with reinforced concrete and materials resistant to corrosion and cement with high resistance were used. The cement tanks were moved to the site and installed in the designated place. They were reinforced from inside and outside to avoid any possible leak that may affect the groundwater and tested by filling them with water in order to check the level. The roof of the tanks is then poured with a layer of high resistance concrete. The completion rate in the construction work is about 90%. The excavation resulted a quantity of red soil suitable for agriculture, which was delivered to the local community to benefit from it. The photos attached to the report indicate the mechanism of work on the site and the steps to complete the work on the two infrastructure units.

Figure 1: Decentralized wastewater treatment plant using the Modified Septic Tank technology installation in Rehab Schools.

Figure 2: Gray water treatment and reuse installation in Rehab Schools.

Fencing in the schools

A Grade-A longitudinal fence has been installed in the area of practical training for girls' students. This longitudinal fence aims to protect the students and provide a safe environment for them, from the trees extended on the ground and give an aesthetic view of the site. An irrigation line has been set up to provide water for proper growth of the grapes at the site.

Figure 3: Fence installation in the Rehab Secondary School for girls

Promoting safe learning environment

MIRRA implemented UNICEF's approach to provide a safe learning environment for students and appropriate learning conditions. The surrounding area of the greenhouses and the practice area were cleaned from all weeds and tree remains. The fence trees were also trimmed in the students' yard to enhance the aesthetic view of the place and facilitate the mobility of students and teachers from the square to the field work area.

Figure 4: Removing weeds and cleaning in the schools.

MIRRA, UNICEF and Wakileh Programmatic Visit to the schools

UNICEF, the general manager of Nabil Wakileh company, and the MIRRA team represented by its manager Dr. Samer, visited the schools to check the progress of the work on treatment units and the irrigation system installed in the area of greenhouses. They discussed the work that will be done in the coming period. The minutes of the programmatic visit are attached in Annex 1.

Figure 5: MIRRA, UNICEF and Wakileh Programmatic Visit to the schools

PROGRAMME OUTPUT 2: Improved practices of key WASH behaviors at home and school through mobilization activities at school and surrounding communities.

Drafting Three Guides for Decentralized Wastewater Treatment and Reuse in Institutions

A guide/manual has been drafted for teachers, concerned parties in relevant authorities, and visitors in order to understand the context and importance of the project and the operation and maintenance procedures (draft in Annex 2). A student guide/manual for ages 11 to 16 was also drafted to understand the context and importance of the project, as well as the operation and maintenance of the irrigation system and water monitoring system as an enhancement to the vocational education curriculum (draft in Annex 3). A simplified guide for children aged 6 to 10 has been drafted on water conservation, hygiene promotion, sustainable irrigation and the importance of trees (draft in Annex 4).

PROGRAMME OUTPUT 3: Effective and efficient programme implementation

- MIRRA, UNICEF and the Ministry of Education are working together on drafting a joint agreement to facilitate the project implementation successfully.

Section Three: Risks, Issues, and Challenges

- Delayed approval of JORISS and The Ministry of Education Agreement may delay the implementation of the action plan.

Section Four: Financial updates (if any)

- An extension of the project until 30/9/2019 was approved with financial amendments to receive a total fund of 201443.2 JOD/284524.3 USD (additional amount of 30089.7 JOD to the original fund on the PCA).

Section Five: Next Steps During August 2019

- Completing the agreement of MIRRA, UNICEF and Ministry of Education.
- Initialize the operation of the decentralized wastewater treatment plants and the gray water treatment and reuse systems.
- Starting the graphic design of the guides materials.
- Starting the formulation of the plans and agreements to sustain the project beyond the due date.
- Procure and implement the remaining needed automatic irrigation system using the treated water.
- Do awareness and advocacy sessions for the community (Pending on the approvals).
- Start the design and creation of a fourth interactive board to display the project scheme to the visitors.
- Complete the renovation of the sanitation units in the three schools.
- Procure hygiene tools for the schools.
- Data collection and calculation on the savings of the water and energy in the schools.

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