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**REPORT**  
of the Training Sessions on  
Using Treated Wastewater in Irrigation  
For the Public Security Directorate in Muqablaine, Jordan  
19 – 20 October 2014

MIRRA - Methods for Irrigation and Agriculture  
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## Introduction

The training conducted at the Public Security Department (PSD) was aimed at the staff working in direct relation with the irrigation system receiving treated wastewater and the plants. The training objective was to provide general information about wastewater reuse in irrigation, the components of the system, inform how to monitor and maintain it, and relay safety and health aspects for safe handling of the system.

The first day covered a wide range of topics related to wastewater characteristics, treatment and reuse. The second day covered aspects related to the irrigation system's safe and efficient operation and maintenance. For a detailed list of the topics covered, see table 1.

## Date and Venue

The training sessions took place on the 19<sup>th</sup> and 20<sup>th</sup> of October, 2014 at the Police Security Directorate in Moqablain area, south of Amman. PSD provided the venue and GIZ provided the material and catering expenses. The team of MIRRA made all of the logistical organisations and implemented the training.

## Training Team

The training team consisted of Dr. Samer Taloz; Assistant Professor at the Jordan University of Science and Technology, and Eng. Haidar Malhas; irrigation expert currently working at the US Aid funded Institutional Support Strengthening Programme.

## Agenda

The agenda of the training was as follows, divided by day:

Day	Topics
<b>Day 1</b> Theoretical Training	<ul style="list-style-type: none"> <li>- Opening and introduction</li> <li>- Wastewater production and reuse (in Jordan in general, and in PSD in particular)</li> <li>- Wastewater characteristics and terminology</li> <li>- Processes and practices at the PSD premises</li> <li>- Wastewater treatment</li> <li>- Treated wastewater reuse in landscape irrigation</li> <li>- Landscape irrigation system main components</li> <li>- Management of landscape irrigation systems</li> <li>- Maintenance of landscape irrigation systems</li> <li>- Emitter clogging and system flushing</li> <li>- Safety measures and practices with regard to treated wastewater</li> <li>- Soil salinity management and leaching</li> <li>- Soil Infiltration Rate</li> <li>- Fertigation - the incorporation fertilizers, soil amendments, or other water-soluble products through an irrigation system</li> <li>- The Best Management Practices Manual based (on PSD conditions)</li> <li>- Questions and remarks</li> </ul>
<b>Day 2</b> Practical training	<ul style="list-style-type: none"> <li>- The kind of equipment that is used for treated wastewater</li> <li>- The filtration system</li> <li>- Operation and maintenance</li> <li>- Questions and remarks</li> </ul>

## Participants

Nine (9) people on the first day and ten (10) people attended the training-workshop on the second day. Six (6) of them were engineers with a bachelor's degree and four (4) were technicians and

worked in support positions (e.g. electricity technicians, air-conditioning technicians). However, none of them works directly with the irrigation system. The list of participants is enclosed in Annex 1.

### The Training Sessions

Day 1 began by Dr. Talozzi introducing himself and presenting the training outline. The trainees were provided with the presentation hand-outs in Arabic and English as well as the Best Practices Manual<sup>1</sup> in English. The training was conducted in the Arabic language.

The first day was divided into 3 parts. In the first part, a power point presentation was used to highlight and discuss the most important topics. See Annex 2 and 3 for the presentation in Arabic and English respectively. The second part was an interactive animated movie, which was used to showcase the best and worst management practices within a facility generating wastewater. The third part was presentation of the Best Management Practices Manual.

On wastewater characteristics, the training focused on practices within PSD that can lead to the betterment of the quality of generated wastewater. In particular, the reduction of fat, oil and grease (FOG) was discussed. An interactive movie was played for the participants, which highlighted the best management practices that can be used to reduce FOG.

Dr. Talozzi highlighted the importance of continuous monitoring of the landscape irrigation system for clogging. He discussed the different reasons of clogging; physical, chemical and biological. The preventive measures were highlighted from the Wastewater Reuse in PSD - Best Practices Manual and explained to the trainees. The economic and environmental benefits of wastewater treatment and reuse on-site were also clarified and discussed. The trainees were impressed by the low-electricity consumption of the wastewater treatment plant. Their engineering and maintenance background enabled them to foresee the long-term benefits and financial savings.

On the other hand, the method used for wastewater on-site was not clear to the participants. Questions were raised about the management of the wastewater treatment plant and the protocols to be used for insuring treated wastewater quality. It would have been ideal to have the training on that conducted before the training on the issue of treated wastewater reuse. In particular, the trainees were very interested about the safety issues and the potential health risks entailed in the reuse of treated wastewater.

Finally, Dr. Talozzi presented the Best Management Practices manual and explained its sections of the manual. The importance of monitoring and maintenance programs were particularly highlighted.



Figure 1. Dr. Samer Talozzi giving his lecture on day 1 of the training.



Figure 2. Eng. Haidar Malhas explaining the irrigation system to the PSD staff.

On Day 2, Eng. Malhas introduced himself and the training outline. After two (2) hours of theory indoors, Eng. Malhas guided the trainees outside to explain the components of the irrigation system, and demonstrate the operation and maintenance principles. He walked the participants through the irrigation system from pump to drippers to identify and demonstrate every component of the system, and its operation and maintenance practices. The outside training was a good opportunity for interaction with the trainer, and they asked many questions.

### Consultant's Remarks and Recommendations

MIRRA's staff and consultant would like to highlight the following:

- The participants oftentimes confused the wastewater treatment process and the reuse for irrigation. This is clearly reflected in their assessment sheets and the discussions, which they had with the trainers.
- In the assessment, some of the trainees noted the need to train the PSD staff members who are responsible for cleaning and utilization of the kitchen, canteen, dry cleaning, and lavatories since it affects the quality of the wastewater treatment plant effluent.

Based on a brief and informal assessment by the trainers, we present the following recommendations:

- Provide PSD staff with a seminar or a training workshop to clarify the steps involved in wastewater treatment.
- Develop this training into a more elaborate and in-depth module, and extend it to more PSD staff, especially those working in the kitchen, canteen, dry cleaning and lavatories as recommended by the training participants.

SWIM – Sustain MED is a Project Funded by the European Union and the German Federal Ministry of Economic Cooperation and Development (BMZ).

### Project Partners



وزارة المياه والري  
Ministry of Water & Irrigation



Al Balqa Applied University  
جامعة البلقاء التطبيقية







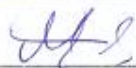
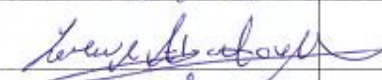






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الاتحاد الدولي لحماية الطبيعة

## Annex 1: List of Participants



برنامج الإدارة المستدامة والمتكاملة للمياه SWIM  
 دورة تدريبية في مديرية الأمن العام  
 ١٩ تشرين أول ٢٠١٤

#	الاسم	التوقيع
١-	محمد بن محمد عبدالله ابو جادو	
٢-	عبد محمد عمر بن المران	
٣-	أنتهاكك عبد الوهاب عوبيات	
٤-	م. محمد صالح خليل البست	
٥-	م. علاء موسى الحمار	
٦-	١٣ شعبان احمد سالم الكزيرغا	
٧-	محمد توفيق جوده	
٨-	يزن محمد أحمد العتوم	
٩-	محمد عطا سلام	
١٠-	هانم ساريات (812)	
١١-	موني ملك (صبرا)	
١٢-	ديار طلوزي (صبرا)	



برنامج الإدارة المستدامة والمتكاملة للمياه SWIM  
 دورة تدريبية في مديرية الأمن العام  
 ٢٠ تشرين أول ٢٠١٤

#	الاسم	التوقيع
١	أنس عاكب عبد الوهاب عوبيات	
٢	علاء موسى عبد الله سلطان	
٣	محمد توفيق سادة العقرواري	
٤	يونس محمد أحمد العنوم	
٥	علاء محمد عمري العراري	
٦	مجدي محمود عبد الله ابو طارو	
٧	ملازم امجد صفا الكسبي	
٨	صالح مهندس شعبان احمد سالم كزبري	
٩	محمد صالح لشعبي	
١٠	نضال محمد عبد لفتاح وند	
١١	حولى ملك (عبرا)	
١٢	صبر ملك (عبرا)	