



CONCEPT NOTE

Regional Training on Technical, Regulatory and Cultural Aspects of Treated Wastewater Reuse (REG-8)

23-24 July 2018

0. CONTEXT

The SWIM-H2020 SM program is a regional technical support program, funded by the Directorate General (DG) NEAR (Neighbourhood and Enlargement Negotiations), that includes the following Partner Countries (PCs): Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine, [Syria] and Tunisia. The areas targeted by this program relate to the environment and water identified as priority sectors for the EU co-operation. Its overall objective is to contribute to reduced marine pollution and to more sustainable use of limited water resources. The technical assistance services are grouped in 6 work packages (WP): WP1. Expert facility, WP2. Peer-to-peer experience sharing and dialogue, WP3: Regional on-site training activities, WP4: Communication and visibility, WP5: Capitalizing the lessons learnt, good practices and success stories and WP6. Support activities.

This training workshop which falls under WP3 is part of the SWIM-H2020 work plan in relation to the regional activities; and refers to Activity No. "REG 8" - training on "Technical, Regulatory and Cultural Aspects of Treated Wastewater Reuse". It will also include a Peer-to-Peer (P2P) session related to the P2P activity no. 10 addressing the same topic.

This workshop will be organized and held in Athens, on 23 and 24 July 2018.

1. INTRODUCTION

The scarcity of water in the Southern Mediterranean Region, comprising the SWIM Partner Countries (PCs) is among the highest in the world. Water demand in these countries is expected to increase, while the water deficit is expected to increase over the next century due to effects of climate change. According to the International Panel for Climate Change (IPCC), rainfall will decrease by 10-25%, runoff will decline by 10- 40 % and evaporation will increase by 5-20%¹.

Given this deficit situation, the use of wastewater reuse is increasingly becoming an alternative source of water supply and a relevant measure to adaptation to climate change.

¹ MIDDLE EAST AND NORTH AFRICA REGION THE WORLD BANK.2009. Water in the Arab World: MANAGEMENT PERSPECTIVES AND INNOVATIONS . N. Vijay Jagannathan Ahmed Shawky Mohamed Alexander Kremer , Editors



However, the potential for wastewater reuse is currently very low, and there are, in many cases, situations of blockage of reuse projects. Although governments in these countries show a willingness to develop wastewater reuse, they face a range of technical, institutional, regulatory, financial and cultural constraints. Review of the constraints more or less common to most countries of the southern Mediterranean and the MENA region, highlights, according to various regional references, recurring constraints that manifest at varying levels, from one country to another. These include: (i) low integration of reuse in the planning of water and sanitation, (ii) failure to take into account the benefits and positive externalities of wastewater reuse, (iii) poor assessment and control of health and environmental risks associated with reuse, (iv) lack of adequate legal framework and gaps in the regulations and the application of guidelines, (v) lack of cost recovery mechanisms related to the investment and operation of reuse works, (vi) inadequate pricing of treated wastewater in the sense that water pricing in the PCs does not reflect the true economical values and opportunity costs, (vii) lack of supportive policies to promote treated wastewater reuse; (viii) unclear institutional arrangements and partnerships and lack of coordination between national agencies and local institutions in wastewater management; and (ix) lack of capacity to address the critical shortage of qualified human resources to solve complex problems arising from wastewater treatment and reuse systems.

2. SCOPE AND OBJECTIVE

The general objective of this regional training workshop is to enhance the knowledge of the key stakeholders who are involved in technical, institutional, regulatory and managerial aspects of treated wastewater reuse in the partner countries with the aim to promote the development of safe, well-managed and socio-economically viable wastewater reuse in climate deficit Mediterranean countries. The specific objective of the training is to introduce the participants to the state-of the art knowledge and the new developments in wastewater reuse guidelines, their limits and conditions of their application and the implications of such guidelines on the regulatory and institutional aspects. The workshop will also be an opportunity to promote south-to south and north to south countries' dialogue and trigger an exchange of experiences between participants through a mix of case studies from the PCs, practical examples from European countries, and break-out sessions, in addition to cross fertilisation between the SWIM DEMO projects and this project on the subject of TWWR.

The workshop is designed and developed in close coordination within the SWIM-HORIZON 2020 SM Consortium notably with ACWUA, LDK, Milieu Ltd, EMWIS. The training will target the subjects that correspond to the sources of blocking to the process of developing a sustainable, diversified wastewater reuse adapted to the contexts of the beneficiary countries, while capitalising on the findings of the activities undertaken within the scope of the Expert Facility (EF) work package and the lessons learnt (Expert Facility Activity numbers: EFS-MO-2² in Morocco, FS-DZ-1³ in Algeria, and

² Activity title: “Support the reuse of treated wastewater, through strengthening of the institutions, development of PPPs, participatory approaches, awareness-raising, and incentives”.

³ Activity title: “Support the reuse of treated wastewater in agriculture, through sensibilisation, and awareness raising”.



EFS-LB-2⁴ in Lebanon) and ensuring synergy with other on-going activities (the P2P activity on treated wastewater reuse and the SWIM demo project).

Relevant documents developed in the framework of the SWIM-HORISON 20020 SM Program or in the framework of other European or Mediterranean initiatives were examined to enrich the training materials.

Training sessions will focus on the modules and topics related in table 2 of section 1.3. It is thus expected from this training that the participants will

- 1) Increase their awareness on the need for the reuse of treated wastewater as an additional water resource to alleviate pressure on conventional water resources, contribute to climate change adaptation in drylands and to inscribe sanitation - reuse in the circular economy approach;
- 2) Reinforce their knowledge on the guidelines and standards to be applied to ensure safe reuse in the different types of use (agriculture, landscape, industry, groundwater recharge, etc.); at this level, the training workshop will engage in a debate that consists of analyzing: i) health risk of TWWR, its assessment and its reduction, ii) the feasibility and applicability of WHO's multi-barrier approach, iii) the relevance of having the same biological quality standards (for each type of use) in the southern and western countries of the Mediterranean, and iv) the need to complete the regulatory framework for reuse, particularly in the case of groundwater recharge, for indirect reuse and for industry;
- 3) Get familiar with the governance arrangements for the wastewater reuse sub-sector through, inter alia: (i) integrating reuse in the upstream water planning and sanitation process, (ii) implementation of an institutional mechanism based on sectoral competences, iii) Options for covering investment and operating costs, particularly tertiary treatment, iv) institutional arrangements, public-private agreements and partnerships, etc.

3. CONTENT

As mentioned before and considering that the participants are active and sufficiently initiated on wastewater reuse and its benefits, the modules selected for this workshop will capitalize on the achievements and initiatives undertaken by countries in the development of wastewater reuse and will seek to improve knowledge on emerging and key aspects that are still deficient in targeted countries at varying degrees depending on the context. The aim is to avoid redundancy and to advance the reflections on the crucial aspects. Thus, training sessions will focus on three modules and topics related in table 1.

⁴ Activity title: “Private Sector involvement in water infrastructure with emphasis on wastewater treatment plants”.



Table 1. Modules and topics selected for the training workshop

Modules	Topics
Module 1 (Introductory): “Wastewater reuse (WWR) in climate deficit countries: opportunities and constraints	- Values of Wastewater Reuse (Wastewater reuse vs Circular Economy, measure of adaptation to climate change, etc.)
	- Direct reuse and indirect reuse: Advantages and disadvantages
	- Constraints mapping (technical, institutional, regulatory, financial, cultural)
Module 2. Strengthening and updating of knowledge on new developments of wastewater reuse guidelines (their limits and conditions of their application)	- Health Risks of Wastewater Reuse in general
	- Guidelines and standards for wastewater reuse vs health risks: Examples in European and/or Southern European countries.
	- Introduction to the legislative and regulatory framework needed for the implementation of WHO standards
	- Assessment of the Risk Associated with the Use of Wastewater in Agriculture
	- Wastewater treatment and risk reduction: argumentation and limitations
	- The multiple-barrier approach (WHO, 2006): argumentation and limitations
	- The feasibility of the Multi-Barrier Approach (MBA) in South and East Mediterranean Countries
	- Harmonization between multiple-barrier and WW treatment levels / case studies: Moroccan harmonization initiative under development, and transposition of the multi-barrier approach in Jordan
	- New concepts: Water Reuse Safety Planning and Water Reuse Safety Plan: according to ‘Water Reuse Safety Plan’



	developed within DEMOWARE project funded under the FP7
	- Discussion and experiences exchange between participating practitioners including SWIM DEMO projects
Module 3. "Governance of wastewater reuse in South and East Mediterranean Countries"	<ul style="list-style-type: none"> - Integration of wastewater reuse in water resources planning (basin river level, ...) and national sanitation plans - to take inspiration from "Guidelines on Integrating Water Reuse in Water Planning and Management in the context of the WFD (Paper endorsed by EU Water Directors at their meeting in Amsterdam on 10th June 2016) In: http://ec.europa.eu/environment/water/pdf/Guidelines_on_water_reuse.pdf - Integration of wastewater re-use in water resources planning in the context of the Water Framework Directive - Institutions responsible for managing & implementing reuse programs/projects (discuss the cases of represented countries) - Legal and regulatory aspects of TWWR: Completion and application of the regulations (of all types of reuse including groundwater recharge) TWWR funding: <ul style="list-style-type: none"> - Investments and operational costs of TWWR systems (Highlighting the particular case of complementary treatment, storage and supply of treated wastewater at the re-use sites) - TWW pricing / the willingness of users to pay for wastewater /Subventions - Adapted Conventions, Models of public-private partnerships (PPP) - Key clauses of a PPP-REUSE contracts - Case Studies



4. SPECIFIC LEARNING OBJECTIVES

The overall aim of the regional on-site training REG-8 is to enhance the knowledge of the key stakeholders who are involved in different aspects of the design and implementation of wastewater reuse schemes at regional and local level in the partner countries and introduce them to the state-of-the-art knowledge and the new developments in wastewater reuse sub-sector.

The specific learning objectives of this training, which guided the design of its content, are as follows:

- Ensure a good understanding of the added value of wastewater reuse in southern Mediterranean countries and translate it into messages to sensitize policy makers;
- Update the mapping of institutional, regulatory, financial and socio-economic, cultural, etc. constraints in the PCs taking into account recent initiatives;
- Improve the understanding of health risks related to the wastewater reuse and methods of their evaluation;
- Strengthen skills on standards and guidelines for different wastewater reuse options, their limits and conditions of application;
- Introduce the participants to the safety planning tool for wastewater reuse;
- Raise awareness and develop participants' capacity to integrate wastewater reuse as early as possible into the water planning and sanitation sub-sector processes;
- Analyse the financing capacities of reuse projects and particularly the funding of complementary treatment (tertiary) and related works (storage tank, pumping, conveyance of treated wastewater to the reuse sites, monitoring of the quality of treated wastewater, etc.);
- Analyse the institutional and contractual arrangements for reuse projects and introduce participants to the roles of the different institutions (based on sectoral competences) and to viable PPP models applicable to different types of TWWR (capitalize on the Activity Facility Activity No: EFS-LB-2 "Procurement of Public-Private Partnerships in Water / Wastewater Sector Training" and the results of Task 3 (PPP-REUSE models) of EFS-MO-2 "Support the Reuse of Treated wastewater through Strengthening of the Institutions, development of PPPs , and Participatory Approaches, awareness-raising, and incentives".

These objectives can be abbreviated as follows:

- Valorise wastewater in countries with climate deficits (and: decision makers sensitized on the added value of wastewater reuse);
- Ensure safe reuse based on appropriate standards and guidelines and best practices including TWW reuse safety planning
- Integrate reuse into water and sanitation planning;



- Set up an institutional governance framework;
- Promote models of financing and management of reuse projects.

5. TARGET AUDIENCE

The intended audience of this training activity includes policy makers, water resource managers and planners, researchers and NGOs working on:

- Planning, implementation and operation of wastewater reuse schemes;
- Development and enforcement of wastewater reuse standards and regulation;
- Environment and public health.

A total of 40 participants are envisaged to attend the training with (a) up to two (2) representatives per partner country from the directorates/departments engaged in the Wastewater Reuse development, implementation and management including the managers of water, agriculture, and the sanitation sub-sector, (b) one national NGO per country, (c) three (3) Regional NGOs, (d) four (4) peers, (e) up to three (3) representatives from SWIM DEMO in addition to the speakers.

6. APPROACH METHODOLOGY TO MEET WORKSHOP OBJECTIVES

In order to achieve the objectives of this training activity, the following pedagogical and didactic methods will be adopted:

- Facilitation of the presentations, in plenary sessions, by the instructors;
- Illustration of messages by concrete cases;
- The organization and facilitation of intermittent sessions for discussion and exchange;
- The organization, in the case of crucial topics, the work of thematic groups with a restitution in plenary.

The key is to adopt a participatory approach, to promote interaction and exchange, and to facilitate the exchange of the countries' experiences.

The Pre and Post training assessments will provide specific feedback on the understanding of wastewater treatment fundamentals and processes and identify the impacts of the workshop on the knowledge level related to each module. .



Copies of the training material will be prepared by the course trainer and provided to all participants on a flash memory and in print-out. A certificate of attendance will be awarded to all participants at the end of the course

The language of the Workshop will be English and French.

7. RESOURCES FOR PARTICIPANTS

Resources that are intended to be provided to participants are :

- PowerPoint presentations
- Printed presentations enabling the participants to add comments and additional explanatory notes
- framework for group discussions
- Case studies and group exercises
- Information sources and references for further reading

8. INSTRUCTORS OF THE TRAINING

- Brahim Soudi (NKE1), Senior Wastewater Reuse Expert & Technical Co-coordinator of the training, Milieu Ltd
- Marta Ballesteros (NKE2), Senior Legal Wastewater Expert & On-site Coordinator
- Nicolas Jeanmaire, Senior Wastewater Treatment Expert , SEMIDE
- Rifaat Abdel Wahaab, Senior Wastewater Expert & Peer-to-Peer Coach, ACWUA

The Water Key Expert, Suzan Taha, will act as resource person and will oversee the harmony of the training workshop and its alignment with the objectives assigned to it.