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

Regional Training Report

23 & 24 July, 2018

Version	Document Title	Authors	Review and Clearance
Draft	Regional Training Report (Reg 8) Technical, Regulatory and Cultural Aspects of Treated Wastewater Reuse	Brahim SOUDI, Technical Coordinator, with the contributions of the following trainers (Experts) Marta Ballesteros Nicolas Jeanmaire Rifaat Abdel Wahaab	Suzan TAHA, Key water Expert

THE SWIM AND H2020 SUPPORT MECHANISM PROJECT (2016-2019)

The SWIM-H2020 SM is a Regional Technical Support Program that includes the following Partner Countries (PCs): Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine, [Syria] and Tunisia. However, in order to ensure the coherence and effectiveness of Union financing or to foster regional co-operation, eligibility of specific actions will be extended to the Western Balkan countries (Albania, Bosnia Herzegovina and Montenegro), Turkey and Mauritania. The Program is funded by the European Neighborhood Instrument (ENI) South/Environment. It ensures the continuation of EU's regional support to ENP South countries in the fields of water management, marine pollution prevention and adds value to other important EU-funded regional programs in related fields, in particular the SWITCH-Med program, and the Climate South program, as well as to projects under the EU bilateral programming, where environment and water are identified as priority sectors for the EU co-operation. It complements and provides operational partnerships and links with the projects labelled by the Union for the Mediterranean, project preparation facilities in particular MESHIP phase II and with the next phase of the ENPI-SEIS project on environmental information systems, whereas its work plan will be coherent with, and supportive of, the Barcelona Convention and its Mediterranean Action Plan.

The overall objective of the Program is to contribute to reduced marine pollution and a more sustainable use of scarce water resources. The Technical Assistance services are grouped in 6 work packages: WP1. Expert facility, WP2. Peer-to-peer experience sharing and dialogue, WP3. Training activities, WP4. Communication and visibility, WP5. Capitalizing the lessons learnt, good practices and success stories and WP6. Support activities.

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ABBREVIATIONS

PCs	Partner Countries
P2P	Peer to Peer
PPP	Public Private Partnership
TWWR	Treated WasteWater Reuse
WHO	World Health Organization
WP	Work Package
WWR	WasteWater Reuse
WWT	WasteWater Treatment

1 GENERAL INTRODUCTION

The SWIM-H2020 SM program is a regional technical support program, funded by the Directorate General (DG) NEAR (Neighborhood 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 also includes a Peer-to-Peer (P2P) session related to the P2P activity no. 10 addressing the same topic.

The training workshop which was held in Athens, on 23 and 24 July 2018 is broken down into the following three modules:

- Module 1 (Introductive): “Wastewater reuse (WWR) in climate deficit countries: opportunities and constraints
- Module 2. Strengthening and updating of knowledge on new developments of wastewater reuse guidelines (their limits and conditions of their application)
- Module 3. “Governance of wastewater reuse in South and East Mediterranean Countries”

2 RATIONALE OF THE ACTIVITY

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 to 40 % and evaporation will increase by 5 to 20%.

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.

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 made in reuse works and their operation , (vi) inadequate pricing of treated wastewater (TWW) 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.

It is exactly this context that motivated the organization of this training workshop. The aim is to improve the knowledge of managers and technicians working in the field of treatment and reuse of wastewater, and in the planning and management of water resources and sanitation.

3 OBLECTIVES OF ACTIVITY

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: (i) the state-of the art knowledge and the new developments in wastewater reuse guidelines and standards, their limits and conditions of their application, (ii) , the integration of reuse into integrated water resources planning and management, (v) funding arrangements for reuse projects, and institutional governance.

The workshop was also an opportunity to promote south-to south and north to south countries' dialogue. It also triggered further exchange of experiences between the participants through a mix of case studies from the PCs, practical examples from European countries, and break-out sessions, in addition to cross fertilization between the SWIM DEMO projects and this project on the subject of treated wastewater reuse (TWWR).

4 EXPECTED RESULTS OF THE ACTIVITY

The capacity of the participants is developed with regards to the following:

- Increased 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, is increased;

- Reinforced knowledge on the guidelines and standards to be applied to ensure safe reuse (direct and indirect) in the different types of use (agriculture, landscape, industry, groundwater recharge, etc.);
- Enhanced managerial competence on the governance arrangements for the wastewater reuse sub-sector through: (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 of tertiary treatment, iv) institutional arrangements, public-private agreements and partnerships, etc.

5 PROFILE OF THE PARTICIPANTS

The audience of this training activity includes policy makers, water resource managers and planners, engineers working on: (i) planning, implementation and operation of wastewater reuse schemes, (ii) development and enforcement of wastewater reuse standards and regulation, an (iii) environment and public health.

A total of 25 participants attended this workshop representing the eight (8) partner countries: Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Palestine, and Tunisia. See the list of participants (appendix 9.2) for more details on their profiles

6 RESULTS OF EXCHANGES

6.1 PLENARY SESSIONS

Table 1 describes the main points discussed and the observations made by the participants following the presentations of the topics developed in the three modules.

Table 1. Results of exchanges in plenary sessions

TOPICS	MAIN POINTS DISCUSSED AND THE OBSERVATIONS MADE BY THE PARTICIPANTS
Wastewater reuse (WWR) in climate deficit countries: opportunities and constraints	
Wastewater reuse: Illustrated added values, and mapping of technical, institutional, regulatory, financial, and cultural constraints in the southern and eastern countries of the Mediterranean	The participants unanimously confirmed the benefits of wastewater reuse and particularly those related to increasing the supply of water resources in areas characterized by the climate deficit. In the light of the case study presented, most of the participants mentioned the following crucial problems: the poor control of treatment technologies, the difficulty of ensuring a good and constant quality of treated wastewater, the weak managerial capacities and financial institutions responsible for sanitation and the lack of involvement of all stakeholders. The exchange was also intense around the standards and quality parameters of treated wastewater and particularly those that

TOPICS	MAIN POINTS DISCUSSED AND THE OBSERVATIONS MADE BY THE PARTICIPANTS
	correspond to emerging contaminants.
SWIM-DEMO (Palestine): Overview with focus on technical aspects of the demo projects	**Innovative Demonstration on Sustainable Integrated Management of Wastewater and Reclaimed Water Use in North West Bank – Palestine – (SWIM) – Phase II** **The presentation developed the financial, social, and institutional aspects related to the implementation of DEMO-Projects. In line with the Technical Level topic, this presentation showed that the following actions are planned and have to be reinforced: :** • Enhancing the capacity of the local authorities (Village Council and the Joint Service Council (JSC) to manage and maintain the sewage system facilities. • Maintenance units will be established. • Staff will be trained. At least 8 engineers will be trained (wastewater management and reuse). • Raising the awareness of school students in 4 schools in Anin Village – 600 students- (2 female schools and 2 male schools) regarding water and wastewater related issues.
	The second presentation highlighted the technical aspects of the SWIM DEMO project entitled "Promote wastewater treatment and reuse in the water scarce areas of the Middle East and North Africa through development and demonstration of innovative financial instruments and inclusive management plans". The project aims at promoting wastewater treatment and reuse in the water scarce areas of the Middle East and North Africa (MENA) by developing scalable and innovative financial instruments and inclusive management plans that can fully recover the costs of wastewater treatment and reuse.
Direct reuse and indirect reuse: Advantages and disadvantages	This aspect was very intensely discussed and kept recurring during the two-days of the workshop. Indeed, most of the participants, who experienced situations of blocking direct reuse of treated wastewater, took an interest in the benefits of indirect reuse.It has been found that participants are more or less familiar with groundwater recharge (although this practice is still underdeveloped) but have no experience with indirect reuse for agricultural purposes by mixing treated wastewater with conventional water (rivers, reservoirs, etc.). Thus, the Jordanian experience was presented as an example of successful mobilization of large amounts of treated wastewater in irrigated agriculture downstream of dams. At the same time, the question of standards was discussed: What quality standards? For what type of TWW reuse? The need for adoption of standards for WW discharge in the receiving medium was discussed but fears about health risks have been expressed.
Strengthening and updating of knowledge on new developments of wastewater reuse guidelines (their limits and conditions of their application)	
• Guidelines and standards for wastewater reuse: WHO Guideline, FAO Guidelines,	The primary objectives of this session were to share good practice and understanding international laws, regulations & guidelines of wastewater reuse. It was also aimed to inspire and

TOPICS	MAIN POINTS DISCUSSED AND THE OBSERVATIONS MADE BY THE PARTICIPANTS
others • Assessing and mitigating of wastewater reuse–related health risks: Multi-barriers Approach • Showcase from PCs (Egypt)	motivate participants to collaborate and develop networks between individuals from participating countries. In addition, showcase from a partner country to encourage participants to learn and acquire experience and knowledge. Participants first explored the challenges facing wastewater reuse projects in the Arab countries, especially the institutional framework and industrial wastewater contaminations. Egyptian wastewater reuse code was presented. This code was of particular importance to a number of participants, who showed interest to exchange information within that context. Perhaps more importantly, participants had the opportunity to ask questions, discuss the issues with each other and to work in groups to identify achievable and longer-term solutions to capacity issues within their own countries in wastewater reuse projects . Emerging contaminants were also presented. Based on the discussion during the session, it was clear that the risk to human health is not yet fully understood & no standards have been formulated in the participating countries. It has been recommended to exchange standards & guidelines on treated wastewater reuse.
• Feasibility of the Multi-Barrier Approach (AMB) 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-barriers approach in Jordan	Following the presentation of these topics, it appears from the debate that some countries have started the process of adopting the multi-barrier approach proposed by WHO in 2006. However, the applicability of this approach seems to be difficult and particularly in terms of effectiveness of post-treatment measures. Thus, the main recommendation that emerges from the exchange and confirms the words developed by the trainer, is that it will be necessary to harmonize between the conventional treatment and the multi-barrier approach in the establishment of standards and conditions of reuse. It has also been recommended to draw inspiration from the standards recently developed by the European Commission by adapting them to the countries contexts.
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	The presentation of the concepts of secure water planning and reuse, newly introduced at the International level (WHO Guidelines) and at the European level, triggered an exchange around the following two points: i) these concepts, although conceptually attractive, the participants pointed out the difficulty of their implementation, due to the uncertainty on their content and coverage, lack of harmonised rules and enforcement ii) most countries that have developed plans or programs for reuse are raising the question of the difficulty of revising these plans by applying these concepts, which are still insufficiently adopted even at European level.
• Introduction to the legislative and regulatory framework needed for the implementation of WHO standards: EU initiatives • Lack of a coherent legislative	The presentation provided an overview of the existing EU legislative framework regulating certain aspects of waste water reuse and water resources planning. It evidenced the lack of coherent EU legislative framework which has triggered the recent proposal for new EU legislative acts regulating the waste water reuse for agriculture and industry and amending the legislation on groundwater. Further examples of legislation

TOPICS	MAIN POINTS DISCUSSED AND THE OBSERVATIONS MADE BY THE PARTICIPANTS
framework for wastewater reuse within the EU • Regulatory initiatives in the area of wastewater reuse in the EU	regulating wastewater reuse in the EU were presented (e.g. Spanish legislation). Most questions raised aimed at clarifying the legislative process for adoption of the legislation, the different Member States' obligations for implementing a Directive or a Regulation and the exiting enforcement mechanisms once the new legislation will be in force. Questions on specific aspects of the legislative proposals were raised in relation to the WHO standards.
Governance of wastewater reuse in South and East Mediterranean Countries"	
Integration of wastewater reuse in water resources planning (basin river level, …) and national sanitation plans: need and approach	This presentation highlighted the need for adoption of a comprehensive approach to integrated water resources management including wastewater reuse. The majority of participants mentioned that this approach is not yet implemented in their countries, which could explain the blockage or failure of several reuse projects. A common understanding of all participants is the need to integrate reuse as much as possible into the sanitation and integrated water resources management plans at the watershed scale. Regulatory management initiatives stipulating reuse in water laws undertaken in some countries (Israel, Jordan, Morocco) were shared. At the EU level, integrated water resources planning is promoted throughout the existing legislation which requires planning and reporting. The proposal for legislative acts includes additional planning measures.
Wastewater reuse governance: Institutions responsible for managing & implementing reuse programs/projects	Almost unanimously, all participants are aware that the institutional governance of reuse in the partner countries is failing. There are no appropriate institutions that handle the reuse component. This constraint is old in most MENA countries. According to the participants, there is often a duplication of interventions by ministries, agencies and sanitation operators. The need for clear legislative framework and effective enforcement systems were highlighted.
Wastewater pricing and willingness of users to pay	This aspect has not been much debated, but discussions and exchanges of experience have shown that i) farmers do not have the capacity to pay for treated wastewater, which confirms the conclusions of the benchmarking recently carried out by SWIM- Horizon 2020, ii) according to most participants, tariffs for treated wastewater should be lower than or equal to conventional water prices; iii) some experiences, particularly in Tunisia, have clearly shown that if re-use is restrictive, farmers are reluctant to revert to wastewater reuse even if the price is low or if the TWW is provided free of charge.
TWWR funding: CAPEX including Tertiary treatment, OPEX, Monitoring cost, … Adapted Conventions, Models of public-private partnerships (PPP) – Key clauses	This aspect was considered crucial by the trainer and the participants. In fact, the additional costs of tertiary treatment and water storage and distribution facilities (in the case of direct reuse), as well as the monitoring of treated waste quality parameters, are very high in all the countries represented. The management of these costs is not institutionalized. Thus, it appears from the exchanges that only traditional arrangements or conventions, often of the public-public type, are adopted and often face difficulties in terms of financing and

TOPICS	MAIN POINTS DISCUSSED AND THE OBSERVATIONS MADE BY THE PARTICIPANTS
	management. The public-private partnership (PPP) models presented by the trainer interested the participants. Some PPP experiences in the field of reuse of treated wastewater for green spaces and golf courses were also presented (Morocco and Tunisia).

6.2 GROUP WORKS

A. Group Work/Technical and financial aspects of treated wastewater reuse (TWWR)

Table 2 summarizes the results of the group work on technical and financial aspects of TWWR.

Table 2. Results of the group work on technical and financial aspects of TWWR

Problems mentioned / questions	Responses & recommendations and feedback from participants
UPSTREAM ISSUES	
Problems related to the impact of industrial discharges	Israel: Pre-treatment must be set up at the industrial level with a tax system applied in the case of non-compliance with the discharge limits values. Regulations must be strict otherwise it is very difficult to change the practices France: It is necessary to distinguish (i) industrial activities that are compatible with a discharge in the collective network (domestic wastewater), with preliminary treatment if necessary, and ii) industrial activities which are too polluting which must be equipped with adequate treatment allowing discharge in the natural environment and not in the municipal collection network. All the participants agree that strong and strict policies are needed to lead these regulatory changes.
Quality issues of collection networks	France: It is necessary to ensure the good rules of conception, dimensioning and realization of the networks, including correct connections. The technical handing-over of the works is necessary to assess the quality of implementation.
Water salinity (case of southern Algeria): what to do when facing high level of water salinity ?	Two solutions were recommended: i) Indirect reuse an, ii) selection of more resistant crop species. Improvement of the enforcement systems was also identified as needed to ensure proper implementation of existing standards.
Downstream issues	
Case of Salmonella detected in TWW (lagoons): case of Morocco	It is necessary to ensure adequate sampling and measurement conditions because the detection is recent whereas the STEP exists for 8 years. It is also possible that sewage sludge accumulation in the lagoons over time, limits the natural disinfection capacity of the lagoon. This case highlights the need for proper operation and maintenance of all WWTPs, even lagoons' systems.
How to efficiently involve farmers?A	Israel experience: It is very important to involve farmers in projects from the outset, in order to know their expectations and also to initiate pedagogical efforts.

	It is also recommended to establish agricultural cooperatives from the start; at the project set up.
How to convince farmers to participate financially in the treatment and in the wastewater reuse system?	It is necessary to define a tariff policy adapted to the local context, which can be progressive but above all to define incentives. The presence of an agricultural cooperative can be a favourable framework

B. Group work / Direct vs Indirect reuse of TWW

Table 3 summarizes the results of the group work on the driving forces and limitations of direct and indirect reuse

Table 3: Direct and indirect reuse: Group work results

Driving forces	Limitations
Direct reuse	
• Avoid loss of high TWW quality • Protection of drinking water resources • New income generation opportunities at local level • Complementary source of water • Environmental protection and groundwater protection	• High cost of treatment • High monitoring cost • High salinity • High maintenance cost • Land availability • Restricted irrigation
Indirect reuse	
• Integration of wastewater in the global water budget at the basin level • Lower cost of treatment • Water tariff is already set up for conventional water for irrigation • Converts more TWW from waste into conventional water resources	• Lack of specific regulations (groundwater recharge) • Case of no recipient

C. Group work /Guidelines and standards for WWR in the PCs: with focus on the parameters related to health risks

C1. Group 1

The questions discussed are as follows

- Which norms for which uses (agriculture, groundwater recharge, landscape, etc.)?
- Why are standards different across the project countries? Is it relevant?
- What are the constraints related to strict standards? Need for additional treatment? Cost of monitoring of TWW quality, cultural aspects, health aspects, etc.
- Restrictive Reuse and Non-Restrictive Reuse: What Impacts on Promoting Reuse?

The main results of this working group are summarized as follows:

- Most of the countries represented in this working group (Algeria, Lebanon, Morocco, Tunisia) have standards for the discharge of wastewater in the receiving natural environment and standards for wastewater reuse in agriculture. The reuse standards in agriculture are either

recently established or revised. Morocco has recently developed a project to revise the reuse standards in agriculture and for green spaces/gulf courses by drawing on the multi-barrier approach. None of these countries have standards for groundwater recharge. Algeria is the only country that has established standards for the reuse of wastewater for industrial purposes.

- It was recommended to harmonize standards related to biological contamination across the countries represented. For other physio-chemical parameters such as salinity or heavy metals they must be adapted to the country context.
- The major constraint related to the adoption of restrictive standards is the high cost of complementary treatment.
- It has been noted particularly through lessons learned from the Tunisian experience, that restrictive reuse is not a preferred option for farmers because it does not allow them to practice high value crops.
- It was recommended to exchange new versions of reuse standards between the countries represented.

C2. Group 2

The questions discussed are as follows

- What is the level of integration of the multi-barrier approach in the current WWR projects in the PCs?
- What are the challenges & barriers encountered in transposing this approach?
- What current initiatives on this aspect?

The main results of this working group are summarized as follows:

In order to integrate multi-barrier approach in wastewater reuse project, standards has to strictly apply. The group discussion indicated that there are variations in the standards applied in the countries, whereby the existing standards cover the following:

- Israel : agricultural, Golf , gardening, and ground water recharge
- Jordan: Agricultural, landscaping, groundwater recharge
- Palestine: Agricultural, landscaping
- Egypt: Agricultural direct reuse, drainage discharge for indirect reuse, golf & landscaping
- Morocco: Agricultural direct reuse, industrial, groundwater recharge, golf & landscaping

During the discussion the group stressed on the challenges & barriers encountered in transposing the multi-barrier approach as follows:

- The most important barrier is the high cost of wastewater treatment (CAPEX & OPEX)
- Lack of technical capacity and the required skills for application
- Restrictive standards to fulfill the requirements for compliance
- Fragmentation of authorities
- Cultural aspects

7 EVALUATION OF THE EVENT

Two categories of indicators were used to evaluate the workshop: i) evaluation indicators, reflecting the quality of the workshop logistics/ organizational aspects (See section A below) and the assessment of the technical quality of the workshop (See section B below), as perceived by the participants, ii) impact indicators, reflecting the direct impact of the workshop (See Section 6 below). The indicators and associated ratings are presented in Tables 4, and 5 respectively. Table 6 provides the specific remarks made by the non-key expert on the workshop (Section C below).

A. Organizational, administrative and planning issues before and during the event

A set of 10 criteria; A1-A10 (See table 4) was assessed by the participants, using a qualitative description ranging between "Excellent" to "Poor", with an opportunity to provide suggestions for improvement. For the sake of comparison, the qualitative descriptions are given assigned numbers as follows: Excellent = 4 Good = 3 Average = 2 Poor = 1

Table 4: Results of the evaluation of the organization, administrative and planning issues

A. ORGANISATIONAL, ADMINISTRATIVE AND PLANNING ISSUES BEFORE AND DURING THE EVENT (8 forms were filled)		*Number of Replies*					
		EXCELLENT	GOOD	AVERAGE	POOR	Total Replies	Average Score (max = 4)
A1	Appropriate handling of invitations, visa support, information sharing and smoothing obstacles	17	4	0	0	21	3,81
A2	Efficient logistics: accommodation, transportation, location of venue and interpretation	12	9	0	0	21	3,57
A3	Provision of support (if requested) for participants' preparation for the event	12	8	0	0	20	3,60
A4	Efficient and effective follow-up of preparations and progress towards the event	11	8	1	0	20	3,50
A5	Planning for the event: selection and design of methodology, program/daily agenda and work rules	5	11	5	0	21	3,00
A6	Smooth flow of program, efficient handling of emerging needs and attentiveness to participants concerns	4	15	1	0	20	3,15
A7	Adequacy of the presentations (Presentations correspond and contribute to the planned objectives and are conducive to enhanced shared understanding and participation on addressed topics)	7	12	2	0	21	3,24
A8	Clarity, coverage and sufficiency of concepts, objectives, anticipated	5	11	4	0	20	3,05

A. ORGANISATIONAL, ADMINISTRATIVE AND PLANNING ISSUES BEFORE AND DURING THE EVENT (8 forms were filled)		Number of Replies					
		EXCELLENT	GOOD	AVERAGE	POOR	Total Replies	Average Score (max = 4)
	outputs						
A9	Usefulness of the distributed material	3	9	5	0	17	2,88
A10	Efficiency and effectiveness of the facilitation	5	14	2	0	21	3,14
A11	Overall rating of the event	8	11	2	0	21	3,29

The overall rating of 3.25 out of four indicates that the event was well appreciated

B. Feedback on Technical Aspects

Table 5 below presents the feedback received from the participants on the technical aspects of the event

Table 56: Results of the evaluation of the technical aspects of the training

B. FEEDBACK ON TECHNICAL ASPECTS		No. of replies
B1	**Coverage of the event In your opinion did the event cover (tick one of the following):**	
	All the topics necessary for a good comprehension of the subject nothing more	7
	Some topics covered are not necessary	5
	Some additional topics should be included	7
	No reply	2
	Total	**21**
B2	**Level of difficulty**	
	Difficult	1
	Adequate	19
	Elementary	1
	No reply	0
	Total Replies	**21**
B3	**Length of the training** **In your view the workshop duration (tick one of the following):**	
	Longer than needed	3
	Sufficient	3
	Shorter than required	15
	No reply	0
	Total Replies	**21**

B. FEEDBACK ON TECHNICAL ASPECTS		No. of replies
B4	**What is the most valuable thing you learned during the workshop (knowledge or skills)?**	
	Summary of findings and recommendations from participants • Development of specific approaches to our context (WW treatment level and capacity for monitoring the quality of treated wastewater) • Sharing knowledge and building skills • Creating professional relationships • 2006- WHO - standards (scope & limits) • The need for clear legislative framework • The feasibility of the multi-barrier approach • Direct reuse and indirect reuse • The technical and financial aspects of TWWR • Restrictive and non-restrictive reuse • Exchange of experiences between countries	
	Total Replies	**20**
B5	**How do you think that the current event will assist you in your future work on the subject?**	
	Summary of findings and recommendations from participants • Expanding the knowledge on wastewater reuse • Conception of the new projects of TWWR by adopting the model of integrated water resources management (IWRM) • Capacity building to improve the performance of the professional exercise • Capitalization on countries' experiences • Adopting the overall watershed planning and reuse management through integrating reuse into sanitation plans • The importance of user's involvement in the planning and implementation process of reuse projects	
	Total Replies	**21**
B6	**Please indicate whether (and how) you could transfer part of the experience gained from the event to your colleagues in your country?**	
	Summary of findings and recommendations from participants • Exchange of data and information • Preparation of a training report and presentation to the concerned parties • Sharing successful knowledge and innovations with co-workers • Initiate the debate among decision-makers on the indirect reuse of treated wastewater • Dissemination of the documents provided • Organization of communication-Day and sharing of messages received	
	Total Replies	**20**
B7	**What did you like most about this event?**	
	Summary of findings and recommendations from participants • All the topics	

B. FEEDBACK ON TECHNICAL ASPECTS		No. of replies
	• Organization • Professionalism of trainers and good atmosphere • The group work and discussions • Experience from other countries	
	Total Replies	**20**
B8	**What needs to be improved?**	
	Summary of findings and recommendations from participants • Very few improvements are needed • Longer workshop duration or shortening of presentations and targeted program evaluation • Preparation of slides in English • Promote discussion sessions • Plan site visits to illustrate the concepts presented • Develop the topic relating to treated wastewater treatment technologies	
	Total Replies	**20**

C. Remarks by the trainer

A set of nine criteria; B1-B8 (See table 6) are used hereby by the trainer to provide an overall assessment of the event.

Table 7: Assessment by the trainer

B1	Efficient and effective performance and interaction by participants: The event was highly interactive with very active discussions on all topics that were addressed. It should be noted, however, that the topics presented were complex and the more active participants were those working on the relevant topics under debate such as : legislative frameworkand standards, the indirect reuse of treated wastewater, institutional and regulatory governance deficiencies and the financing of reuse projects. The event was also an opportunity to share country experiences through the discussion and presentation of the case studies. Globally, the event demonstrated active listening, and effective interaction building respectful relationships within and between participants and the trainers.
B2	**Efficient and effective cooperation and team spirit:** the following factors improved the efficiency of the workshop's work: i) the targeted topics corresponded to the points of blockage of wastewater reuse, ii) the predisposition of the participants to appropriate the key messages and recommendations to help them find apposite solutions for their contexts, and iii) presentation of new concepts and approaches for standard adaptation, integrated reuse planning, and reuse-projects funding. Team spirit was strongly consolidated and stimulated by the organization of group work. Globally participants were highly motivated and cooperative as well as highly collaborative. This is mainly due to the interest in the workshop topics & the presentations as demonstrated by the questions asked & issue raised by the participants.
B3	**Level of achievement of planned objectives:** Two indicators can show the level of completion of the objectives of the workshop: i) the great interest of the participants in the majority of the topics presented, and ii) the net improvement of the awareness, knowledge and skills observed after filtering of the test-results before and after the workshop (see table 7).
B4	**Did the event contribute to helping participants practice skills or gain knowledge related to course concepts:** Absolutely yes, but a major eminent risk lies in the fact that some participants are not concretely implied in reuse projects in their countries. This prompts us for future training sessions to add criteria of relevance to the choice of participants. Indeed, a formation must be **U**seful (it is the

	case for our workshop), **U**sable (it is the case for our workshop), but also and especially **Used** (which is not probable).
B5	**What worked well during the event;** discussions within the group, and exchange with the trainers, clear structure of the workshop and of the presentations providing the necessary elements for a fruitful discussion. The welcoming environment generated by the organisers, the workshop leader and the trainers helped an active exchange of views and participation. Flexibility in the use of languages by the participants facilitated active contributions.
B6	**What didn't work well and why:** Three key causes slightly reduced the performance and overall impact of the workshop: i) a busy schedule with respect to the duration of the workshop, ii) the heterogeneity of the participants' profiles, most of which are not active in the area of reuse, iii) the translation from English to French which according to the participants was not effective, and iv) the presentations which were written and presented in French (making it less easy for the Anglophone participants to follow the presentations). **Also** noted: i) repetition of some information in the workshop presentations. Also, The quizzes - Due the time constraints, ii) Filling in the quizzes and evaluation forms. There were some issues between the French and the English version, not in full correspondence.
B7	**What components/concepts did participants seem to understand well:** the benefits of wastewater reuse, guidelines and standards, and wastewater and water management and planning.
B8	**Were there any components/concepts that participants appeared to not understand**: i) integrated reuse planning, ii) Reuse Safety Plans, and iii) PPPs models. These topics require more time, expanded training support and cases studies.
B9	**What aspects of the event could be improved and what to be kept:** Three of the participants who filled the evaluation form would have liked the inclusion of case studies. What worked well was the discussion between different participants. This could be the major highlight of the training.

8 ANALYSIS OF THE RESULTS OF THE TRAINING SESSION

The training succeeded to mobilize a significant number of participants implied in water and wastewater reuse management as indicated in Table 7 below.

Table 8: Workshop participation/ demographics

Total No. of participants actually attending	23
Total No. of participants Planned to attend	31
Planned/Actual	74%
Number of organizations/agencies/authorities that were represented	8
Gender balance (% of women participants)	39%
NGO representation: No. of participants from NGOs	5

Prior to the training workshop, a pre-training assessment questionnaire was distributed to test the level of knowledge of the participants in the various subjects of the training. The quiz was also distributed after the training to test the impact of the training.

The results of the quiz are summarized in table 8.

Table 9: Evaluation of the results of the quiz

Questions/themes	% of participants who responded correctly to test questions prior to the training	% of participants who responded correctly to test questions after to the training	Comments
Q1: Reasons for treating raw wastewater before reuse in agriculture?	47,6%	47,6%	The "wastewater treatment" component is insufficiently assimilated by the participates and has not been the subject of a specific module
Q2: Restrictive reuse and non-restrictive reuse of treated wastewater	38,1%	50,0%	Net improvement of knowledge
Q3: wastewater reuse options corresponding to indirect reuse	76,2%	86,4%	Net improvement of knowledge
Q4: Quality parameters of treated wastewater closely related to public health	14,3%	23,8%	Net improvement of knowledge
Q5: Quality parameters of treated wastewater susceptible to impact negatively the soil and surface/groundwater water quality in the case of non-adoption of best practices	42,9%	60,0%	Net improvement of knowledge
Q6: Aspects recommended by the new WHO guidelines for the reuse of wastewater in agriculture, based on the multi-barrier approach	23,8%	47,6%	Net improvement of knowledge
Q7: Factors impeding the reuse of treated wastewater in agriculture	47,6%	65,0%	Net improvement of knowledge
Q8: Benefits of Public-Private Partnership (PPP)	81,0%	100%	Net improvement of knowledge
Q9: Pillars of a successful plan / reuse program?	85,7%	90,0%	Improvement of knowledge already well assimilated by the participants
Q10: Good governance referential of wastewater reuse programs	90,5%	90,5%	knowledge already well assimilated by the participants

9 PEER 2 PEER SESSION

The Peer2Peer session of wastewater reuse was designed to provide opportunities to individuals from two or more countries as “peers," to exchange knowledge and experience leading to mutual learning on how to deal with the most difficult challenges in wastewater reuse sector. Peers and recipient countries have been identified: Jordan as offering country; and Algeria, Egypt & Morocco as recipient countries.

During the session, the following five main issues were discussed:

1) Jordan’s experience in standards & Regulation focusing on crops irrigated with TWW
2) Appropriate WWT technologies for reuse that removes physio-chemical & biological Parameters (N/A)
3) The institutional framework/set-up for wastewater reuse.
4) Standards for WWR in Jordan, for other purposes especially for golf courses, groundwater recharge, industrial use (Priority for 3 Countries)
5) Criteria for evaluation of suitability of treated wastewater for irrigation use (FAO)
6) Applicability of decentralized approaches to wastewater treatment and management in developing countries(N/A)

It has been decided to focus on issue no. (4) as a priority one for the three recipient countries to focus on and exchange knowledge & experience with Jordan as offering country. It was agreed on both timeframes and deadline (end of October 2018).

10 CONCLUSION AND GLOBAL ASSESSMENT

This 2-day Regional On-Site Training was organized 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 Project’s Partner Countries (Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Palestine, Tunisia). Participants were introduced to state-of the art knowledge and the new developments in wastewater reuse guidelines and their implications on regulatory and institutional aspects.

Through this Training, the stakeholders gained valuable knowledge on wastewater valorisation, safe reuse of wastewater based on appropriate standards, guidelines and best practices, the integration of wastewater reuse into water and sanitation planning as well as the financing and management of reuse projects. Participants gained greater knowledge and understanding of the existing legislative framework at EU level and in some Member States including current proposals for new legislation. The presentations and case studies provided the participants with the opportunity to reach conclusions on the need for a clear legislative framework on wastewater reuse and an appropriate enforcement

system to ensure the effective implementation. One of the main remarks of participants was the recognition that standards are not implemented.

Setting up an institutional governance framework was also covered in this training which was a valuable asset for the participants.

The Training was also a means for cross-fertilization between the SWIM DEMO projects and the SWIM H2020 SM project on TWWR, by facilitating two-way exchanges on the large scale and small-scale application of treated wastewater reuse in these countries.

The four topics, introduced by the experts, and which received particular attention from the participants during the 2-Day training, are: i) the debate around the guidelines and standards for safe wastewater reuse, ii) the need for harmonization between the conventional wastewater treatment and WHO- multi-barriers approach for securing wastewater reuse (WWR) in terms of health and environment, iii) the comparative advantages of indirect reuse of treated wastewater where this option is technically feasible, and iv) the need for adopting an integrated approach to WWR planning at the watershed scale.

During the exchange, the governance of the reuse emerged as one of the priority themes which deserves to be improved in the concerned countries through i) the establishment of an adequate institutional and managerial system, ii) the regulation and the standardization of the reuse inspired by the European guidelines but adapted to the contexts of the beneficiary countries, iii) the setting up of adequate financing mechanisms and incentives, in addition to iv) the reinforcement of the technical capacities of the managers of wastewater treatment and reuse schemes to ensure good performance and viability of the installations.

11 ANNEXES

11.1 AGENDA

Day 1: 23 July 2018

Time	Description	Speaker	Moderator /rapporteur
09:00-09:10	Welcome Remarks and workshop framing	Suzan Taha	
09:10-09:30	Pre-training test	Brahim Soudi	
Module 1. Wastewater reuse (WWR) in climate deficit countries: opportunities and constraints			
09:30-11:00	1.1 Wastewater reuse: Illustrated added values, and mapping of technical, institutional, regulatory, financial, and cultural constraints in the southern and eastern countries of the Mediterranean	Nicolas Jeanmaire	
11:00-11:20	Coffee Break		
11:20-12:00	SWIM-DEMO (Palestine): Overview with focus on technical aspects of the demo projects Questions & Answers		
12:00-12:40	1.2 Direct reuse and indirect reuse: Advantages and disadvantages	Nicolas Jeanmaire	
12:40-13:40	Open discussions & questions and answers in plenary sessions (10 minutes)		Rifaat Abdel Wahaab
	Break-out sessions: ✓ Group 1: Technical and financial aspects of TWWR (30 minutes) ✓ Group 2: Direct vs Indirect reuse of TW (30 minutes) Restitution of thematic group work in plenary session (20 minutes)		Group 1. Nicolas Jeanine / Brahim Soudi . Group 2 : Rifaat Abdel Wahaab/ Brahim Soudi
13:40-14:40	Lunch Break		
Module 2. Strengthening and updating of knowledge on new developments of wastewater reuse guidelines (their limits and conditions of their application)			
14:40-15:40	2.1. Guidelines and standards for wastewater reuse: WHO Guideline, FAO Guidelines, others 2.2. Assessing and mitigating of wastewater reuse–related health risks: Multi-barriers Approach 2.3. Showcase from PCs(Egypt)	Rifaat Abdel Wahaab	

15:40-16:10	Discussions: exchange around the guidelines	Rifaat Abdel Wahaab	Marta Ballesteros
16:10-16:30	Coffee Break		
16:30-17:00	Introduction to the legislative and regulatory framework needed for the implementation of WHO standards: EU initiatives Questions & Answers	Marta Ballesteros	Rifaat Abdel Wahaab
17:00-17:30	Recapitulation of the results of the first day and reminder of the content of the program of the second day	Brahim Soudi	Suzan Taha/ Rifaat Abdel Wahaab

Day 2: 24 July 2018

Time	Description	Speaker	Moderator /rapporteur
09:00-10:00	Module 2 (Continued) 2.5 Feasibility of the Multi-Barrier Approach (AMB) in South and East Mediterranean Countries 2.6 Harmonization between multiple-barrier and WW treatment levels / case studies: Moroccan harmonization initiative under development and transposition of the multi-barriers approach in Jordan 2.7 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	Brahim Soudi	
10:00-10:30	2.8 Lack of a coherent legislative framework for wastewater reuse within the EU 2.9 Regulatory initiatives in the area of wastewater reuse in the EU	Marta Ballesteros	
10:30-11:00	Group discussions (Two groups) Group 1: Guidelines and standards for WWR in the PCs: with focus on the parameters related to health risks: - Which norms for which uses (agriculture, groundwater recharge, landscape, etc.)? - Why are standards different across the project countries? Is it relevant? - What are the constraints related to strict standards? Need for additional treatment? Cost of monitoring of the TWW quality, cultural aspects, health aspects, etc. - Restrictive Reuse and Non-Restrictive Reuse: What Impacts on Promoting Reuse? Group 2: - What is the level of integration of the multi-barrier approach in the current WWR projects in the PCs? - What are the challenges & barriers encountered in transposing this approach? What current initiatives on this aspect?		Group 1: Brahim Soudi Group 2: Rifaat Abdel Wahaab
11:00-	Coffee Break		

11:20			
11:20-11:45	Group discussions (continued)		Group 1: Brahim Soudi Group 2: Rifaat Abdel Wahaab
11:45-12:15	Restitution of thematic group work in plenary session		Marta Ballesteros/ Brahim Soudi
Module 3 **"Governance of wastewater reuse in South and East Mediterranean Countries"**			
12:15-12:45	3.1 Integration of wastewater reuse in water resources planning (basin river level, …) and national sanitation plans: need and approach	Brahim Soudi	
12:45-13:00	3.2 Case of EU: Integration of wastewater re-use in water resources planning in the context of the Water Framework Directive	Marta Ballesteros	
13:00-14:00	Lunch Break		
14:00-15:00	3.3 Wastewater reuse governance: Institutions responsible for managing & implementing reuse programs/projects (discuss the cases of represented countries), completion and application of the regulations (of all types of reuse including groundwater recharge) 3.4 Wastewater pricing and willingness of users to pay 3.5 TWWR funding: CAPEX including Tertiary treatment, OPEX, Monitoring cost, … 3.6 Adapted Conventions, Models of public-private partnerships (PPP) – Key clauses	Brahim Soudi	
15:00-15:30	Group discussions (Two groups) Group 1: Governance of the treated wastewater reuse sector: gaps and ways to improve in PCs Group 2: What are the solutions for the constraints related to the financing of wastewater reuse projects (CAPEX & OPEX)? What are the tools to encourage investments and involvement of private sector in wastewater reuse projects?		Group 1: Nicolas Jeanmaire/ Marta Ballesteros Group 2: Rifaat Abdel Wahaab/Brahim Soudi
15:30-16:00	Restitution of thematic group work in plenary session		Brahim Soudi / Marta Ballesteros
16:00-16:20	Coffee Break		
16:20-17:20	Plenary: the peer-to-peer process P2P Learning Approach:		

	- Concept, Aim and Rationale - Learning Cycle – Stages & Processes - Process Execution - Evaluating Progress & Outcomes Topic, experiences and outlook (Open discussion/PCs demand driven) - P2P Objectives & Outcomes - Focus Groups - Receiving Expertise, Offering Expertise	Rifaat Abdel Wahaab	Moderated by Suzan Taha
17:20-17:50	- Closing of Training and Post training test and assessment and workshop evaluation - Distribution of the certificates	Brahim Soudi & Suzan Taha	

11.2 LIST OF PARTICIPANTS

COUNTRY	TYPE OF INSTITUTION (please use the options provided*)	TITLE (Mr/Ms)	FIRST NAME	LAST NAME	POSITION/ FUNCTION	ORGANISATION/ INSTITUTION	EMAIL
Egypt	NKE	Mr	Rifaat	ABDELWAHAB	Senior Wastewater Expert & Peer-to-Peer Coach	SWIM and H2020 SM	rawahaab@yahoo.com
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Jordan	Ministry representative	Mr	Mohammad	KABASHNEH	Head Division of Technical Support for Wastewater treatment plants	Water Authority of Jordan	Mohammad_Kabashneh@mwi.gov.jo
Morocco	Ministry representative	Mr	Badre	MECHTI	Ingénieur d'Etat – Chargé de projet	Division d'Approvisionnement en Eau Potable et Assainissement en milieu Rural (DAEPAR) / Direction de la Recherche et de la Planification de l'Eau / Secrétariat d'Etat Chargé de l'Eau	mechtiba@gmail.com
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Israel	Government agency	Mr	Mazin	ZOABI	Project coodinator	Israli Water Authority	mazenz@water.gov.il
Greece	NKE	Ms	Konstans	ITHAKISIOU	Event Organizer	SWIM and H2020 SM	cit@ldk.gr

11.3 QUIZ

TRAINING ASSESSMENT QUESTIONNAIRE

Workshop Title	**SWIM-Horizon 2020 Support Mechanism** **REG-8: Regional Training on Technical, Regulatory and Cultural Aspects of Treated Wastewater Reuse** **Topics: "Wastewater Reuse: benefits, constraints, guidelines, safety Plan, wastewater reuse integration in water & sanitation planning, governance, financing, …"**
Date	23-24 July 2018
Venue Location	Athens, Greece
Participant Name	
Participant Title/ Position	
Participant Country	
INSTRUCTIONS/ INSTRUCTIONS: Please respond to the questions below. Your feedback is sincerely appreciated. Thank you.	

1. Except of the health risk, there is no limit in the reuse of the TWW in: (1 out of 3 is correct answer)

☐ True
☒ False
☐ It depends on the type of crop

2. Among the following treatment processes, which are those that can be accepted for the reuse of treated water in agriculture: (3 out of 5 are correct answers)

☐ Activated sludge process + bacterial bed
☒ Planted bed with reeds + disinfection
☒ Activated sludge process + disinfection
☐ Lagoon systems (2 consecutive lagoons)
☒ Lagoon systems (3 lagoons)

3. Among the following pricing modalities, which are already implemented? (1 out of 5 is correct answer)

☐ Free of charge
☐ % of the drinking water price
☐ Price determined on the basis of the users' real capacities
☐ Same price with the m3 price of the conventional water resource used for irrigation
☒ All the above

4. What are the main reasons for treating raw wastewater before reuse in agriculture? (2 out of 5 are correct answers)

☐ To completely eliminate pathogens
☐ To remove all organic and chemical contaminants
☒ To reduce health risks
☒ To mitigate environmental impacts
☐ To have treated waste water of similar quality as conventional water

5. Among the following objectives of restrictive reuse and non-restrictive reuse of treated wastewater, what are the correct objectives? *(**Restrictive reuse**: 1 out of 3 is the correct answer; **Non-restrictive** reuse:* 2 out of 3 are correct answers*)*

☒ Restrictive reuse limits the number and type of crops to be irrigated with treated wastewater
☐ Restrictive reuse increases farmers' willingness to irrigate with treated wastewater
☐ Restrictive reuse allows the irrigation of products consumed without cooking

☒ Non-restrictive reuse requires a higher level of wastewater treatment
☒ Non-restrictive reuse makes it possible to irrigate more large number of crops
☐ Non-restrictive reuse allows reuse "zero health risk" and requires no precaution

6. Which of the following wastewater reuse options correspond to indirect reuse?
(2 out of 4 are correct answers)

☒ Groundwater recharge
☒ Injection of treated wastewater into rivers, dams, ...
☐ Irrigation of crops with treated wastewater provided by a treatment plant
☐ Irrigation of landscapes or golfs courses by treated wastewater provided by a treatment plant

7. Which of these quality parameters of treated wastewater are closely related to public health? (2 out of 6 are correct answers)

☐ Physical water quality considerations (Turbidity, color, etc.)
☐ Chemical water quality considerations (Chemical constituents including solids, metals, nitrogen, phosphorus, salinity, Sodium alkalization hazard, etc.)
☐ Biochemical water quality parameters (DBO5, DCO)
☒ Pathogens including bacteria, helminths, virus, etc.
☒ Emerging water quality considerations (Pharmaceuticals, hormonal products, personal care products, other...)

8. Which of these quality parameters of treated wastewater susceptible to impact negatively the soil and surface/groundwater water quality in the case of non-adoption of best practices? (3 out of 5 are correct answers)

☐ Physical water quality considerations (Turbidity, color, etc.)
☒ Nitrogen and Phosphorus
☐ Biochemical water quality parameters (BOD5, COD)
☒ Salts concentrations
☒ Sodium Adsorption Ratio (SAR)

9. Which of the following aspects are recommended by the new WHO guidelines for the reuse of wastewater in agriculture, based on the multi-barrier approach? *(2 out of the 4 is the correct answer)*

☐ A high level and performant wastewater treatment before reuse in irrigation
☐ The elimination of pathogens by a given level of treatment is supplemented by good post-treatment practices (irrigation, agricultural production and handling techniques, hygienic consumption practices, etc.).

☐ Reuse of raw wastewater by adopting protective and hygienic measures
☐ The adoption of a control and risk management approach

10. Which of the following factors impede the reuse of treated wastewater in agriculture? (2 out of 5 are correct answers)

☐ Aridity and drought
☐ Non-restrictive reuse
☒ Exaggerated strict reuse standards
☐ Lack of conventional water
☒ High tariffs of cubic meter of treated wastewater

11. Public-Private Partnership (PPP) models offer the following benefits, which are correct? *(3 out of 6 answers are correct)*

☐ Funding is totally provided by the public entity
☒ Financial equilibrium is provided by PPPs contracts
☐ Treated wastewater is provided free of charge to users
☒ The treatment plant manager is responsible for monitoring the quality of wastewater required for use
☐ PPPs are sustainable even though the demand for treated wastewater is low
☒ PPPs help to compensate the gap in the technical capacities of public entities

12. Which of the following are the pillars of a successful plan / reuse program? (1 out of the 5 answers is correct)

☐ Integration of wastewater reuse planning in global water management at basin level
☐ Providing reliable treatment for the environment and the requirements of the environment.
Protection of public health and the Environment
☐ Gaining public acceptance
☐ Economic viability
☒ All the above

13. Good governance of wastewater reuse programs refers to: (1 out of the 5 answers is correct)

☐ Adoption of intersectoral cooperation and coordination
☐ The establishment of an adequate regulatory and normative framework
☐ Mobilization of financing
☐ The involvement of potential users from planning to implementation
☒ All the above

THANK YOU!