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Water and Environment Support

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Regional training on Waste Water Treatment for Reuse

Activity Number: RW-5-REG

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ABBREVIATIONS

<i>CB/MEP</i>	Capacity Building / Mediterranean Environment Programme
<i>DWWT</i>	Decentralised Wastewater Treatment
<i>DWWTP</i>	Decentralised Wastewater Treatment Plant
<i>ENI</i>	European Neighbourhood Instrument
<i>EU</i>	European Union
<i>EC</i>	European Commission
<i>ENI</i>	European Neighbourhood Instrument
<i>NKE</i>	Non-Key Expert
<i>PCs</i>	Partner Countries
<i>P2P</i>	Peer to Peer
<i>RW</i>	Regional activity on Water
<i>SWIM</i>	<i>Sustainable Water Integrated Management</i>
<i>SWIM-Horizon2020 SM</i>	Sustainable Water Integrated Management – Horizon 2020 Support Mechanism Project
<i>WES</i>	Water and Environment Support
<i>WWT</i>	Wastewater Treatment

1 GENERAL INTRODUCTION

The "Water and Environment Support (WES) in the ENI Neighbourhood South Region" project is a regional technical support project funded by the European Neighbourhood Instrument (ENI South). WES aims to protect the natural resources in the Mediterranean context and to improve the management of scarce water resources in the region. WES mainly aims to solve the problems linked to pollution prevention and the rational use of water.

WES builds on previous similar regional projects funded by the European Union (Horizon 2020 CB/MEP, SWIM I and II, SWIM-Horizon 2020 SM) strives to create a supportive environment and increase the capacity of all stakeholders in the partner countries (PCs).

The WES Partner Countries are Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Libya, Palestine, Syria, and Tunisia. However, to ensure the coherence and effectiveness of EU funding or to promote regional cooperation, the eligibility of specific actions can be extended to neighbouring countries in the Southern Neighbourhood region.

As part of the WES project workplan for the third year (2021-2022), related to the Regional Activities, a regional training focusing on Wastewater Treatment for Reuse (WWTR) (Activity No. RW-5-REG) as well as a study tour related to the same topic (RW-5-ST) were envisaged to be organised.

1.1 RATIONALE OF ACTIVITY

As part of the WES project workplan for the third year (2021-2022) related to the Regional Activities, a 4 day regional, on-line, training focusing on "**on Wastewater Treatment for Reuse (WWTR)**" (Activity no. RW-5-REG) was planned to be organised targeting participants/ representatives from the Partner Countries (PCs). **Due to COVID19 pandemic, the training was organised on-line** and has been carried out along different sessions of a total of 16 hours and along four different sessions during May - June 2022.

2 OBJECTIVES OF ACTIVITY

The **purpose of the specific regional training RW-5-REG** was to build the capacity of the project countries (PCs) on proper treatment of wastewater focusing on small WWTPs in rural zones with a view to safe effluent reuse. It included technological aspects for reuse (best available technologies), planning for wastewater treatment, operation and maintenance aspects, financial management options of Wastewater Treatment Plants (WWTPs) in addition to identification of suitable sites to accommodate possibilities for reuse, assessment of impacts of treated wastewater reuse, and recommended mitigation measures, and incentives to improve attractiveness of reuse.

The **main objectives** of the training were:

- To supply wastewater utilities and water authorities in the partner countries with the basic knowledge, skills, methods and tools needed to self-initiate and steer target-oriented change processes within their own organization towards improved **rural** sanitation, public health and water resources management and with a specific focus on reuse in a rural setting.

- To enable wastewater utilities in the partner countries to conduct new operational tasks in an effective, performance-oriented and sustainable manner.

The “Training on Wastewater Treatment for Reuse” focused on necessary basic knowledge and practical skills relevant for the planning, selection, design, construction and operation and maintenance of **small-scale, decentralized wastewater treatment (DWWT) plants (DWWTP)** to be implemented (or even already operational) in a number of **rural** locations all over the project region; **taking also into consideration the suitability of the treatment technologies for effluent reuse.**

After the Training, the participants were supposed to have the basic knowledge and tools at hand, enabling them to make informed decisions about the selection, design as well as operation and maintenance of the most common types of DWWT plants in a sound manner, based on comprehensive background knowledge. Moreover, they will be aware of the specific requirements that are associated with the reuse of treated wastewater under rural conditions.

They will be able to understand the underlying principles of wastewater management and treatment, basic economic challenges in sanitation as well as the legal and enabling requirements and will be able to understand typical operational challenges that will have an impact on their future wastewater management practices.

The training sessions focused on the modules detailed below:

- **Module 1:** Best low-cost wastewater treatment technologies for small villages/industries and for tertiary treatment for reuse
- **Module 2:** Assessment of impacts of treated wastewater reuse, and recommended mitigation measures
- **Module 3:** Financial management options of small WWTPs in rural zones including O&M considerations
- **Module 4:** Incentives to improve attractiveness of reuse
- **Cross Cutting Issues to be considered in all Modules:** Exercises, Complementarity, Capitalisation and Cross Fertilisation

Throughout the training event, participants had the opportunity to:

- 1) Explore the range of wastewater treatment technologies in rural areas, typically low in population and located far from large built-up areas, and cannot be linked cost-effectively to larger network
- 2) Explore the issues and challenges related to wastewater treatment
- 3) Get introduced to solutions successfully implemented under comparable conditions
- 4) Learn about basic and underlying engineering principles
- 5) Understand internal and external factors that may result in failed projects
- 6) Get familiar with operational procedures and challenges
- 7) Get introduced to professional peers and potential cooperation partners
- 8) Review case studies and success stories
- 9) Implement rapid exercises in addressing practical problems.
- 10) Share experiences and discuss real situations in their own countries where decentralised solutions for wastewater treatment with subsequent reuse can be implemented.

Other objectives included promotion of north to south and south to south exchange and experience sharing through:

1. Presenting practical examples also from a European context, as needed.
2. Facilitating the exchange of experiences between participating practitioners.

3 INSTRUCTORS OF THE COURSE AND GUEST SPEAKERS

The training was implemented by *GOPA Infra GmbH* involving the two Non-Key Experts (NKE) listed in table 3-1 in consultation with the key experts of the WES project: Ms. Suzan TAHA (Water KE based in Amman, Jordan) and Professor Michael SCOULLOS (Team Leader based in Athens, Greece).

Frank POGADE (FP)	NKE1 - Technical Coordinator / Senior Expert on Wastewater Treatment and Reuse
Andreas SCHMIDT (AS)	NKE2 - Senior Expert on Wastewater Treatment and Reuse

Invited Speakers presenting case studies and „real-life experience” were:

Date	Module	Speaker	Organisation	Title / Project
17.5	Module 1: Best low-cost wastewater treatment technologies for small villages/industries and for tertiary treatment for reuse	Dr. Ing. Anacleto Rizzo rizzo@iridra.com	IRIDRA Srl / Italy	Experiences with decentralized management of wastewater with Nature-based Solutions in Mediterranean Countries: from conventional wastewater treatment plants to innovative food-water nexus approaches
19.5.	Module 2: Assessment of impacts of treated wastewater reuse, and recommended mitigation measures	Thomas Gester t.gester@atbwat er.com	ATB Water GmbH	Experiences from DWWT projects in Jordan: Police Headquarters PSD Moqabalane near Amman / Jordan (2014) - In the frame of SWIM – SM project and Nursing Home “Sisters of the Cross” in Fuheis near Amman / Jordan (2013-2018) - In the frame of SMART project
June 7, 2022	Module 3: Financial management options of small WWTPs in	Eng. Elias R. Abu Mohor elias@arij.org	Applied Research Institute Jerusalem - ARIJ	Scalable and innovative financial instruments that can fully recover the costs of wastewater

Date	Module	Speaker	Organisation	Title / Project
	rural zones including O&M considerations			treatment and reuse at a demonstration site in Wadi Al-Aroub, Palestine
June 9, 2022	Module 4: Incentives to improve attractiveness of reuse	Mr Wassem Mushtaha Wassem.Mushtaha@oxfam.org	OXFAM OPTI	Reuse of treated wastewater for agriculture irrigation in southern part of Gaza Strip”, implemented by OXFAM in Rafah and Khan Younis Governorates, Gaza Strip/ Palestine
June 9, 2022	Module 4: Incentives to improve attractiveness of reuse	Dr. Gerhard Rappold	Independent Consultant	Understanding the Water-Energy-Food Security Nexus

4 ON-LINE TRAINING PLATFORM

The WES Project selected a provider for a tailored on-line platform allowing:

- About 60 participants in video mode joining from different remote locations (home/office)
- Hosting 4 to 5 panellists
- Possibility to share training material during the session
- Possibility for all participants to take the floor and share their screens
- Simultaneous interpretation running in parallel within the same platform (EN-FR and FR-EN)
- Parallel breakout sessions (with interpretation)
- Running polls/ surveys and presentation of results live during the sessions (export of poll results as well)
- Possibility for Q&As
- Chat privately or for all the group
- Recording of sessions (MP4)
- Security and confidentiality of all data exchanged
- Automatic export of the list of participants (for each module per session and per breakout session).

The platform used ensured security and confidentiality of data exchanged. Technical support was provided during the sessions and a training of the experts to use the main functions of the tool was organised before the actual training workshop. A test meeting with the participants and speakers before the first session was conducted in order to resolve any arising issues during the actual training workshop.

5 GENERAL PRINCIPLES

The design and delivery of the training was based on the following guiding principles:

- **Short sessions:** The programme has to be divided in sessions of maximum 4 hours per training day, including focus group discussions and exercises.
- **2 days per week,** to provide time for trainees to prepare themselves for the next sessions and read background documents.
- **Overall duration is 4 weeks,** agenda is to be prepared well in advance to make sure that (most of) participants will be available for all the defined timeslots.
- **Background material provided in advance**, highlighting the most important parts of the sessions to avoid spending too much time on details during the sessions.
- **Strict time keeping:** To keep the training dynamic, **timing will be reminded** at the **beginning of the session** and **before each sub-session**. Speakers and participants will be reminded by the facilitator or timekeeper.
- **Good coordination team:** For each session, the role of the team members will be defined in advance: session facilitator, speakers, timekeeper, chat box manager, breakout sessions facilitators.
- **Presentations will allow interactions: Making references to the background materials,** focusing on the understanding of key concepts, introducing breakout sessions and Wrap-ups.
- **Breakout sessions maximum 30 mins:** Organised around exercises and discussions with feedback to the plenary session when relevant.
- **Short polls after/during presentation:** to keep the attention of participants and get direct feed-back (using tools such as Mentimeter, Slido, etc.),
- **Quiz at the beginning and end of the training (after all sessions have ended):** A general “baseline” quiz for all sessions - to check if concepts are familiar to the participants and/or well understood - will be performed **prior to the start of the training** and **another quiz after all sessions are completed** allowing to check the progress in knowledge acquisition through the educational/training interventions
- **Building a community:** it is important to develop relationships between participants, from the same country and from different countries to allow exchange of experiences during, between and after the sessions (e.g. with a forum on WES website).
- **Training duration:** About 16 hours on-line (equivalent to about 3 days of face to face training) including screening of relevant video materials, questions and answers, case study presentations.
- **Provision of material:** pdf version of slides, hands-out for breakout sessions, workbooks and background documents

6 TARGET AUDIENCE

Each partner country was invited to **nominate six (6) participants (whose CVs will be reviewed to ensure its adequacy for the training)**.

To take full advantage of the training, the following profiles were suggested:

- Experience in planning, design and operation and maintenance of wastewater treatment plants,
- Representing, as much as possible, different stakeholders: Ministries of Water, Irrigation Authorities, River Basin Authorities, Geological Survey Agencies, Water/Wastewater utilities, local authorities/municipalities. Emphasis will be given to those responsible for small communities. The combinations will be tailor-made to the conditions of each country
- Involvement in the planning, design and operation of Wastewater treatment plants as part of the IWRM plans and programmes aiming to safeguard the health and environment in the PCs.
- Computer literacy (in particular MS-Excel file)
- Familiarity with national and local water policies
- Fluency in English or French with adequate English reading skills¹

Participation of national experts with good knowledge in WWT and reuse was encouraged, in order to strengthen the exchange of experiences with the other participants of the group and enhance capitalisation on work already developed at national level.

7 DATES AND TIMES

The regional training was carried out along **four sessions** of a total of 16 hours held during May and June 2022. The dates for each session of the on-line training are listed below:

- Session 1: Tuesday, 17 May 2022
- Session 2: Thursday, 19 May 2022
- Session 3: Tuesday, 7 June 2022
- Session 4: Thursday, 9 June 2022.

The starting and ending time of the training sessions was as follows:

- Algeria, Morocco, Tunisia: 9:30 AM - 1:30 PM
- For Egypt, Libya: 10:30 AM - 2:30 PM
- Jordan, Israel, Lebanon, Palestine: 11:30 AM - 3:30 PM

¹ Understanding written English was necessary as most of existing background material will be in English

8 TRAINING PROGRAMME

The regional training was carried out along four sessions of four (4) hours each. The overarching topics of the sessions were:

- **Module 1:** Best low-cost wastewater treatment technologies for small villages/industries and for tertiary treatment for reuse
- **Module 2:** Assessment of impacts of treated wastewater reuse, and recommended mitigation measures
- **Module 3:** Financial management options of small WWTPs in rural zones including O&M considerations
- **Module 4:** Incentives to improve attractiveness of reuse
- **Cross Cutting Issues to be considered in all Modules:** Exercises, Complementarity, Capitalisation and Cross Fertilisation

All the sessions were supported with video screening to enhance understanding of concepts, technological solutions, best practices, etc.

Each training session lasted for around 4 hours. Sessions comprised of the following components and related timelines (times are indicative only):

- | | |
|--|---------------|
| • Presentation: | 120 minutes |
| • Questions and Answers: | 10-15 minutes |
| • Breakout sessions: | 30-40 minutes |
| • Wrap-up from breakout sessions: | 15 minutes |
| • Evaluation quiz at the beginning and end of training | 10 minutes |
| • short quiz/polls | 10 minutes |
| • Conclusion of each training day: | 10 minutes |
| • Break | 20 minutes |
| • Workshop Evaluation at the end of the training | 15 minutes |

The detailed agendas of the four days are attached to the Annex.

The day-by-day detailed agenda was provided to registered participants prior to the training.

9 ELEMENTS OF THE WORKSHOP IMPLEMENTATION

No. of presentations on examples/case studies (sharing of experiences, good practices, etc.)	numerous
No. of international speakers from the Region	3
No. of international speakers from the EU	2
No. of interactive/participatory activities (open discussions, brainstorming sessions)	2

10 PROFILE OF THE PARTICIPANTS

The regional training targeted civil and mechanical and environment engineers. It addressed decision makers, technical directors and managers, heads of engineering, O&M and planning departments, academicians/experts/consultants from private businesses and stakeholders involved in wastewater treatment at different scales and contributing to improved environmental flows in the PCs and effluent reuse. NGOs were also invited and selected through the Bluegreen project and its network.

11 EVALUATION OF THE EVENT²

11.1 RESULTS OF THE EVENT

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

A set of 11 criteria; A1-A11 (See table below) were assessed by the participants, using a qualitative description ranging between “Excellent” to “Poor”.

A. ORGANISATIONAL, ADMINISTRATIVE AND PLANNING ISSUES BEFORE AND DURING THE EVENT		EXCELLENT	GOOD	AVERAGE	POOR	Total Replies	Average Score (max = 4)
A1	Appropriate handling of invitations, visa support, information sharing and smoothing obstacles	14	6	2	0	22	3.5
A2	Efficient logistics: accommodation, transportation, location of venue and interpretation	11	10	1	0	22	3.4
A3	Provision of support (if requested) for participants’ preparation for the event	12	9	1		22	3.3
A4	Efficient and effective follow-up of preparations and progress towards the event	11	9	2	0	22	3.4
A5	Planning for the event: selection and design of methodology, programme/daily agenda and work rules	10	11	1	0	22	3.4
A6	Smooth flow of programme, efficient handling of emerging needs and attentiveness to participants concerns	11	8	3	0	22	3.4
A7	Presentations correspond and contribute to the planned objectives and are conducive to enhanced shared understanding and participation on addressed topics	9	11	2	0	22	3.3

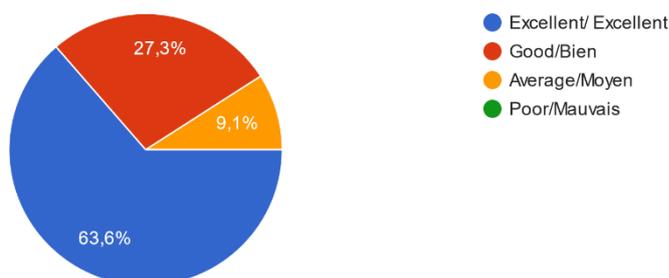
² As Event is considered to be: training session, peer-to-peer session and study tour

A. ORGANISATIONAL, ADMINISTRATIVE AND PLANNING ISSUES BEFORE AND DURING THE EVENT		EXCELLENT	GOOD	AVERAGE	POOR	Total Replies	Average Score (max = 4)
A8	Clarity, coverage and sufficiency of concepts, objectives, anticipated outputs	6	9	4	0	22	2.7
A9	Usefulness of the distributed material	10	7	5	0	22	3.2
A10	Efficiency and effectiveness of the facilitation	11	9	2	0	22	3.4
A11	Overall rating of the event	9	12	1	0	22	3.4

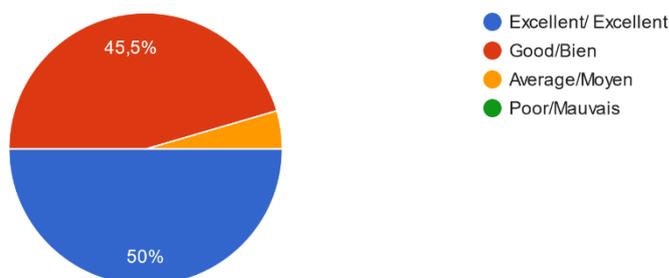
The overall rating of the training is 3.4 of 4, which can be considered a success.

B. Feedback by participants:

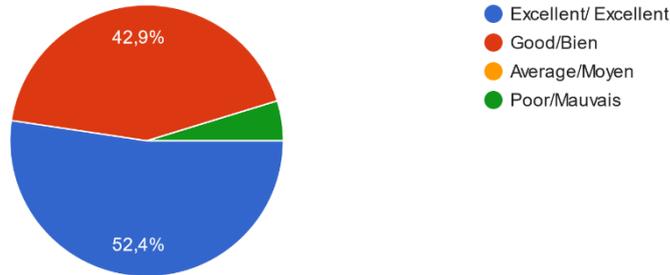
A.1. Appropriate handling of invitations, information sharing and addressing emerging difficulties/Gestion appropriée des invitations, diff... informations et aide à la résolution des difficultés
22 απαντήσεις



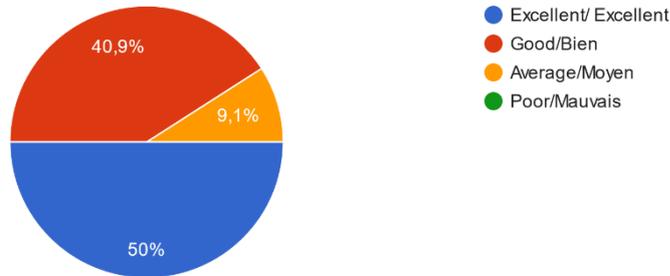
A.2. Efficient logistics: user-friendly online platform and interpretation / Efficacité de la logistique: plateforme en ligne facile à utiliser, qualité d'interprétation
22 απαντήσεις



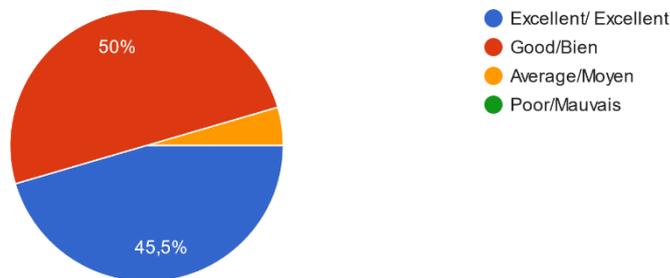
A.3. Provision of support (if requested) for participants' preparation for the event / Assistance fournie (si elle a été demandée) pour le travail préparatoire des participants pour l'évènement
21 απαντήσεις



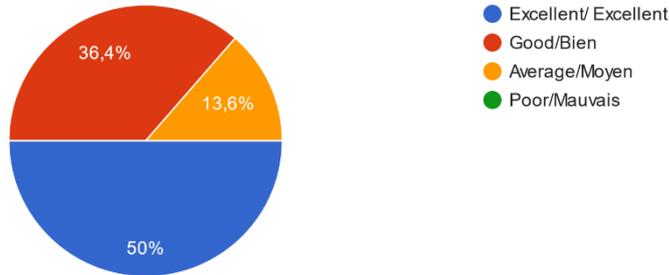
A.4. Efficient and effective follow-up of preparations and progress towards the event / Suivi efficace de la préparation et des progrès accomplis pour la tenue de l'évènement
22 απαντήσεις



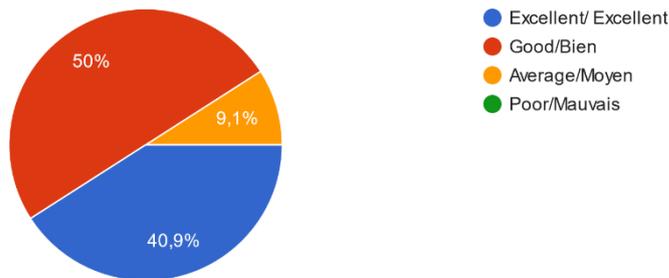
A.5. Planning for the event: selection and design of methodology, programme/daily agenda and work rules / Planification de l'évènement: choix et ...ogie, programme/ ordre du jour et règles de travail
22 απαντήσεις



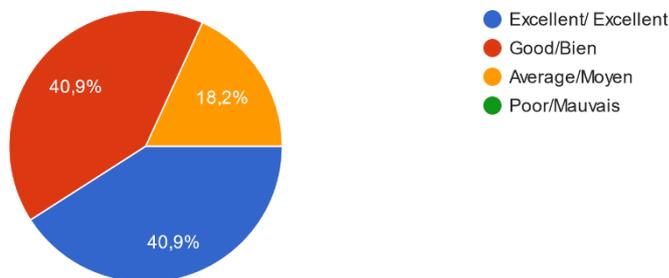
A.6. Smooth flow of programme, efficient handling of emerging needs and attentiveness to participants concerns / Bon déroulement du programme des besoins émergents et aide aux participants
22 απαντήσεις



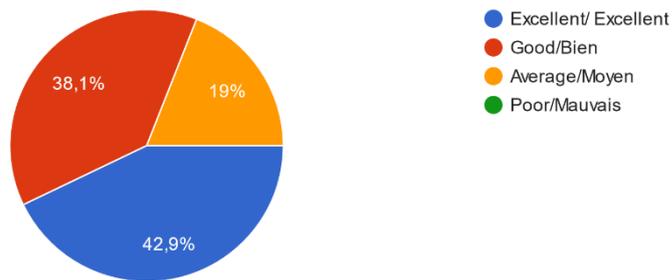
A.7. Presentations correspond and contribute to the planned objectives and are conducive to enhanced shared understanding and participation o...tuelle et la participation aux questions abordées
22 απαντήσεις



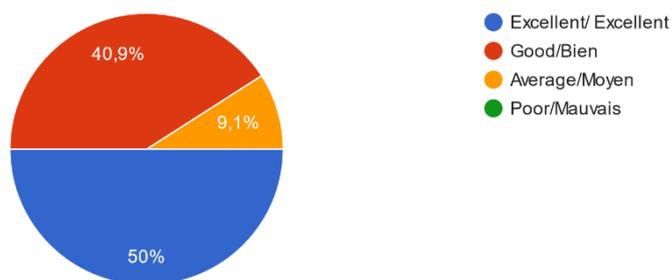
A.8. Clarity, coverage and sufficiency of concepts, objectives, anticipated outputs and outcomes / Clarté, couverture et suffisance des notions, des objectifs, des produits et des résultats attendus
22 απαντήσεις



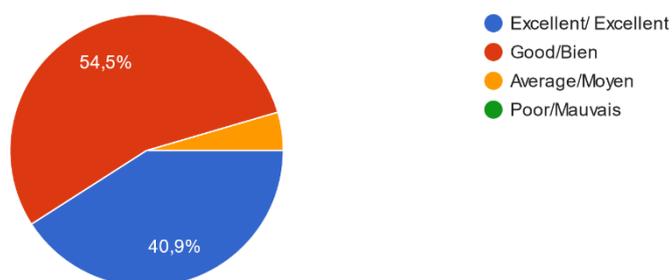
A.9. The materials distributed were helpful / Les matériels distribués ont été utiles
21 απαντήσεις



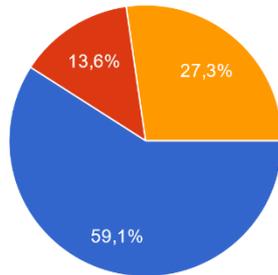
A.10. Efficient and Effective Facilitation / Modération efficace
22 απαντήσεις



A.11. Overall rating of the event / Evaluation globale de l'évènement
22 απαντήσεις

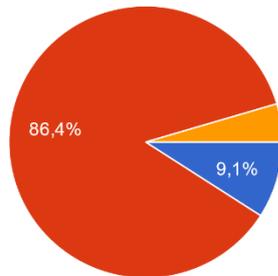


B.1. Coverage of the event. In your opinion did the event cover (tick one of the following): /
Couverture de l'évènement. A votre opinion l'atelier a traité (cochez une des options suivantes):
22 απαντήσεις



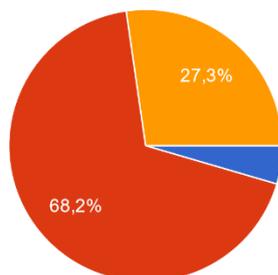
- All the topics necessary for a good comprehension of the subject nothing more / Tous les sujets nécessaires pour la bonne compréhension de la thématique et rien de plus
- Some topics covered are not necessary / Some topics covered are not necessary
- Some additional topics should be included / Des sujets supplémentaires devraient être inclus

B.2. Level of difficulty (tick one of the following): / Niveau de difficulté (cochez une des options suivantes):
22 απαντήσεις



- Difficult / Difficile
- Adequate / Adéquat
- Elementary / Élémentaire

B.3. Length of the training. In your view the workshop duration (tick one of the following): / Durée de l'atelier de formation. A votre avis, la durée de l'atelier était (cochez une des options suivantes):
22 απαντήσεις



- Longer than needed/ Trop longue
- Sufficient / Sufisante
- Shorter than required/ Trop courte

Summary of most frequent statements made by the participants	
B4	<p>What is the most valuable thing you learned during the workshop (knowledge or skills)?</p> <ul style="list-style-type: none"> • Monitoring parameters in WWTP • Management of health risks, technological aspect of reuse • Monitoring parameter of wwtp • Alternatives available for WWT and reuse management • Case studies • New techniques for decentralized systems • Sludge management • The fact that bamboo harvested from constructed wetlands can be mixed with sludge and transformed into biochar, serving as carbon sinks • Understanding the types of treatment used in other countriesla • The use of wastewater for irrigation of bamboo and the production of biochar, the revenue from which is used to cover the operating costs of the treatment plant • Nexus approach • Black and gray water separation efficiency • Carbon sinks
B5	<p>How do you think that the current event will assist you in your future work on the subject?</p> <ul style="list-style-type: none"> • • Monitor the water quality parameter in drains • We learned from the workshop that there is sufficient documentation and successful projects that can be duplicated or adapted to our country context • Learning from pilot projects • Monitor WQ of drains • Get more information and knowledge and sharing experience between us • It would be helpful if our Establishment starts to operate similar waste water treatment plants • Direct reuse of purification by-products • Once we start as establishing the operation of WWTP, this training will help us in our future work. • Propose courses drawn from the present case studies • Develop training themes for my executives in relation to the reception • Cite case studies presented in seminars and to authorities to develop the collection • Some of the topics encouraged me to read more about it and the discussion panels, brain storm activities and experiences sharing reformulate the vision in some subjects

Summary of most frequent statements made by the participants	
B6	<p>Please indicate whether (and how) you could transfer part of the experience gained from the event to your colleagues in your country?</p> <ul style="list-style-type: none"> • Yes, either during meetings or workshops or by sharing the documents provided during this training. • Sharing of documents and presentations with the various departments • Teach colleagues everything I learned • Share knowledge by dissemination of materials given to my colleagues through group mail • The design and evaluation of wastewater reuse projects • We will organize a meeting in which we can share our knowledge obtained during this training with my colleagues at work. • Sharing and discussing the materials also, transfer by lectures and technical support.
B7	<p>What did you like most about this event?</p> <ul style="list-style-type: none"> • Interaction with participants, break out groups and sharing Palestinian experiences • To have the experiences of other countries in the reuse of treated wastewater • Perfectly organized • Interventions from different countries and lesson learned • Coordination, simplicity, modesty of the presenters and moderators and their willingness to provide all necessary information • Standardization of by-products • The sharing of successful experiences of other countries relating to the reuse of wastewater • The high skills and expertise of the trainers • Exchange of experiences
B8	<p>What needs to be improved?</p> <ul style="list-style-type: none"> • Interpretation • More time for training • Purification and industrial depollution • The presentations and materials to be sent by email instead of chat box • Allocate more time for the training sessions • The processing of a real project at the end of the training to be able to evaluate the good assimilation of the content of the training by the participants • The timing from 11.30-3.30 was not really suitable for participants in Lebanon because they finish work at 2 o'clock and need to reconnect from home • Enrich advantages with case studies • Develop the issues raised by the speakers • Preparation before the course for a proper time for the purpose of knowledge sharing

C. Remarks by the trainer

<p>B1</p>	<p>Efficient and effective performance and interaction by participants</p> <p>Qualitative assessment: Average</p> <p>Explanation: The application of an online training format, participants that didn't know each other and languages challenges were the main reason for an average result.</p> <p>Interaction between trainers and participants did not always meet the expectations, most probably due to the fact that the training had to be done online. Quality of internet connections and related problems created additional challenges.</p>
<p>B2</p>	<p>Efficient and effective cooperation and team spirit</p> <p>Qualitative assessment: Good (+)</p> <p>Explanation: The level of cooperation and team spirit among the project team and participants was very good. Measured on the level of participatory decision-making processes, timely sharing of information and improvisation in cases where technical problems appear during the online sessions.</p>
<p>B3</p>	<p>Level of achievement of planned objectives</p> <p>Qualitative assessment: Good (-)</p> <p>Explanation: The online training sessions offered a comprehensive overview in range and level of detail of the topics allowing the participants to take home what was most relevant for them. Further could all topics and messages provided in the training sessions as set in the training ToRs and the post-training quiz showed an increased knowledge before and after the training. Nevertheless, the trainers had hardly any control over what the specific training needs of each participant were and to what extent the training conveyed the needed knowledge and skills effectively. Due to the fact the specific training needs of the individual participants were not known before, such needs could not be grouped and no tailor-made training packages and tests provided.</p>
<p>B4</p>	<p>Did the event contribute to helping participants practice skills or gain knowledge related to course concepts</p> <p>Qualitative assessment: no</p> <p>Explanation: Due to the format of the training sessions and the open selection process of the participants didn't allow to implement effectively practical exercises that would allow the participants to apply and to test the gained knowledge.</p>
<p>B5</p>	<p>What worked well during the event</p> <ul style="list-style-type: none"> - The overall event preparation - Technical support and translation - The attendance of the participants in terms of attending all session and to stay in the session for all 4 hours - Screening of videos, management of break out rooms and discussions
<p>B6</p>	<p>What didn't work well and why</p> <ul style="list-style-type: none"> - Time management, certain session blocks or guest speaker took too long - Sometime acoustic, its important that the speaker have professional headsets - A relatively low number of participants joined the conversations / discussions

B7	<p>What components/concepts did participants seem to understand well</p> <p>The questions in the Q&A rounds and the quiz were the only opportunity where the trainings got feedback from the participants and are not enough to provide relevant answer to this question.</p> <p>Most of the topics were apparently comprehended very well. The issue of Carbon Credits in water management appeared to be completely new to most (if not all) the participants</p>
B8	<p>Were there any components/concepts that participants appeared to not understand</p> <p>Not to the knowledge of the trainers, since the questions in the Q&A rounds and the quiz were the only opportunity where the trainings got feedback from the participants and are not enough to provide relevant answer to this question</p>
B9	<p>What aspects of the event could be improved and what to be kept</p> <ul style="list-style-type: none">- As long the specific training needs of the participants are not known before the training the event can only remain as an event comprehensively knowledge and information get offered and the participants can choose what is relevant for them. An open format for a wider range and number of participants.- If the training shall convey specific knowledge and skills, participants need to be selected and grouped accordingly and closed tailor-made training session with a limited number of participants conducted. In that case a training should have the following components: informative part, exposure, practical exercise.- The training ToR were not very clear on the above-mentioned points and listed topics were often too broad or needed tailor-made detail sessions to knowledge efficiently and effectively.- Splitting topics in blocks each 30-45 min followed by Q&A is good- The introduction of presentations made by guest speakers appears to be a favorable concept.- Online training over 4 hours appears too long, the online format, acoustics, languages barriers and a lot of new information requires a lot of concentration <p style="margin-left: 40px;">→ In general, a training like this, where numerous practical aspects are supposed to be introduced, may not be suitable for an online training.</p>

12 ANALYSIS OF THE TRAINING COURSE RESULTS (quiz results)

A pre- and post-training knowledge test was carried out (refer to the Annex) in order to evaluate the efficiency of the training course. Unfortunately, only 16 participants answered the final test, compared to 32 prior to the training. The table below indicates the results:

Changes in awareness, knowledge and skills. New acquired knowledge	Before	After	Before the training		After the training		Improvement
			Correct replies before the event	Correct %	Correct replies after the event	Correct %	
No. of completed Questionnaires	32	16					Improvement based on right answer
Question No1			3	9	5	31	+ 22
Question No2			18	56	11	69	+ 13
Question No3			12	38	9	56	+ 18
Question No4			10	31	10	63	+ 32
Question No5			8	25	5	31	+ 6
Question No6			9	28	6	38	+ 10
Question No7			8	25	4	25	0
Question No8			5	16	4	25	+ 9
Question No9			1	3	4	25	+ 22
Question No10			12	38	4	25	-13
Question No11			8	25	5	31	+ 6
Question No12			1	3	2	13	+ 10
Question No13			18	56	11	69	+ 13
Question No14			9	28	6	38	+10
Question No15			5	16	4	25	+ 9
Question No16			5	16	4	25	+ 9

In conclusion it can be stated that the training resulted in improved knowledge among the participants. The average “knowledge gain” is 11%.

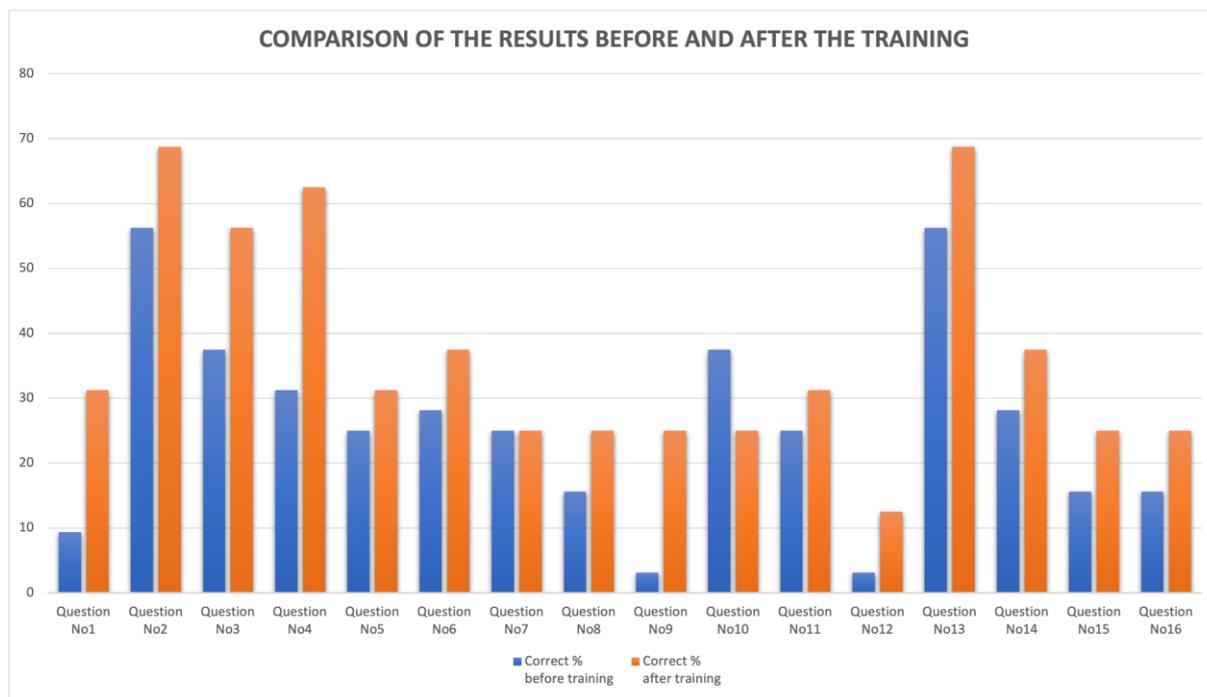


FIGURE: CHANGES IN THE PARTICIPANTS’ KNOWLEDGE

13 CONCLUSIONS & OVERALL ASSEMENT

The “Regional Training on Waste Water Treatment for Reuse” (Activity Number: RW-5-REG) has been successfully delivered without any technical or organsiational difficulties. The post-training quiz indicated a gain of knowledge among the participants. Attendance remained high over all 4 sessions, although the final feed back was only provided by 22 trainees.

Valuable feedback was collected from the Trainees, which should be considered for a potential next phase and / or a repetition of the training course.

In conclusion it can be said that this training met a demand and contributed to increased knowledge on decentralised wastewater management and reuse among stakeholders in the participating countries.

14 ANNEXES

14.1 AGENDA

Regional training on Waste Water Treatment for Reuse

Activity Number: RW-5-REG

Module 1:

Best low-cost wastewater treatment technologies for small villages/industries and for tertiary treatment for reuse

May 17, 2022

From 11:30 to 15:30 pm Athens time (CEST+1)

(Video-conference)

PROGRAMME

11:00-11:30	Access to the video-conference / testing of connections and equipment
11:30-12:20	Welcome and General Introduction
	<p>Welcome Address & Introduction <i>Ms. Suzan TAHA, Key Water Expert, WES</i></p> <p>Introducing the Regional Training <i>Prof. Michael SCULLOS, Team Leader, WES</i></p> <p>Introduction of the Trainers and Overview of the Content of Module 1 <i>Mr. Frank Pogade, Senior Wastewater Expert & Technical coordinator, Non-key Expert, WES</i></p> <p>Pre-training test (10 min)</p>
12:20—13:30	Workshop Presentation 1
12:20-12:30	<p>Video 1 - Introductory Video</p> <p>Part 1 of Module 1</p> <ul style="list-style-type: none"> ➤ Definitions ➤ Wastewater Streams ➤ Wastewater conveyance / Sewer Concepts ➤ Q&A
12:30-13:30	<p><i>Mr. Frank Pogade and Andreas Schmidt</i></p>
13:30-13:50	Coffee Break (20 mins)



13:50-14:20	<p>Presentation of Guest Speaker</p>
	<p><i>Experiences with decentralized management of wastewater with Nature-based Solutions in Mediterranean Countries: from conventional wastewater treatment plants to innovative food-water nexus approaches</i></p> <p><i>Dr. Ing. Anacleto Rizzo / IRIDRA Srl, Italy, Expert in water management and climate change adaptation</i></p> <p>Q&A</p> <p><i>Facilitator: Mr. Frank Pogade</i></p>
14:20-15:00	<p>Workshop Presentation (Continued)</p>
	<p>Part 2 of Module 1</p> <ul style="list-style-type: none"> ➤ <i>Considerations on technologies</i> ➤ <i>Examples</i> ➤ <i>Projects Costs</i> ➤ <i>Technology Selection#</i> ➤ <i>Q&A</i> ➤ <i>Video 2</i> ➤ <i>Design & Engineering Considerations</i> ➤ <i>Typical Challenges and Potentials for Failures</i> ➤ <i>Quality Assurance</i> <p><i>Mr. Frank Pogade and Andreas Schmidt</i></p>
15:00-15:40	<p>Breakout Rooms - Group work discussion & Presentation of Results</p>
15:00-15:30	<p><i>Group work discussion in breakout rooms (4 work groups)</i></p> <p><i>Mr. Frank Pogade</i></p> <p><i>Mr. Andreas</i></p> <p><i>Mr. Steffen Niemann</i></p> <p><i>Ms. Suzan TAHA</i></p> <p><i>All participants split in 4 working groups with the 4 moderators</i></p>
15:30-15:40	<p><i>Presentation of working groups' results in plenary sessions</i></p>
15:40-15:50	<p>Q&A and Wrap-up (Video 3)</p>

Regional training on Waste Water Treatment for Reuse

Activity Number: RW-5-REG

Module 2:

Assessment of impacts of treated wastewater reuse, and recommended mitigation measures

May 19, 2022

From 11:30 to 15:30 pm Athens time (CEST+1)

(Video-conference)

PROGRAMME

11:15-11:30	Access to the video-conference / testing of connections and equipment
11:30-11:40	Welcome
	<p>Welcome and Summary of Module 1</p> <p><i>Mr. Frank Pogade, Senior Wastewater Expert & Technical coordinator, Non-key Expert, WES</i></p> <p>Video 1 - Introductory Video</p> <p>Overview on the program for today</p> <p>Video 2</p>
11:40—12:30	Workshop Presentation 1
11:40—12:30	<p>Part 1 of Module 2</p> <ul style="list-style-type: none"> ➤ <i>The overall concept of reuse and potentials</i> ➤ <i>Wastewater and reuse at global level</i> ➤ <i>Resource recovery potential</i> ➤ <i>Decentralised resource recovery</i> ➤ <i>Resource separation and reuse at source level</i> ➤ <i>Video 3</i> ➤ <i>Resource separation and reuse at city level – case study Hamburg</i> ➤ <i>Video 4</i> ➤ <i>Wastewater reuse applications</i> ➤ <i>Examples</i> ➤ <i>The resource recovery potential of municipal wastewater</i> <p><i>Mr. Frank Pogade and Andreas Schmidt</i></p>
12:30-13:00	Breakout Rooms - Group work discussion & Presentation of Results



12.30-12:50	<p>Group work discussion in breakout rooms (4 work groups)</p> <p><i>Mr. Frank Pogade</i></p> <p><i>Mr. Andreas</i></p> <p><i>Mr. Steffen Niemann</i></p> <p><i>Ms. Suzan Taha</i></p> <p><i>All participants split in 4 working groups with the 4 moderators</i></p>
12:50-13:00	<p>Presentation of working groups' results in plenary sessions</p>
13:00-13:30	<p>Workshop Presentation (Continued)</p>
	<ul style="list-style-type: none"> ➤ <i>Relevant WW parameters and impact</i> ➤ <i>Risks to environment and public health</i> <p><i>Mr. Frank Pogade and Andreas Schmidt</i></p>
13:30-13:50	<p>Coffee Break (20 mins)</p>
13:50-14:20	<p>Presentation of Guest Speaker</p>
	<p>Experiences from DWWT projects in Jordan</p> <p><i>Thomas Gester / ATB Water GmbH and Managing Director of ATB Environmental Technologies Ltd., Ireland</i></p> <p>Q&A</p> <p><i>Facilitator: Mr. Frank Pogade</i></p>
14:20-15:15	<p>Workshop Presentation (Continued)</p>
	<p>Part 2 of Module 2</p> <ul style="list-style-type: none"> ➤ <i>Risk Mitigation</i> ➤ <i>Water quality standards for reuse</i> ➤ <i>Treatment technologies for reuse</i> ➤ <i>Disinfection technologies</i> ➤ <i>Performance monitoring</i> ➤ <i>Benchmarking and KPIs</i> <p><i>Mr. Frank Pogade and Andreas Schmidt</i></p>
15:15-15:30	<p>Q&A and Wrap-up</p>

Regional training on Waste Water Treatment for Reuse

Activity Number: RW-5-REG

Module 3:

Financial management options of small WWTPs in rural zones including O&M consideration

June 7, 2022

From 11:30 to 15:30 pm Athens time (CEST+1)

(Video-conference)

PROGRAMME

11:15-11:30	Access to the video-conference / testing of connections and equipment
11:30-11:40	<p>Welcome</p> <p><i>Welcome and Summary of Module 2</i></p> <p><i>Mr. Frank Pogade, Senior Wastewater Expert & Technical coordinator, Non-key Expert, WES</i></p> <p><i>Overview on the program for today</i></p>
11:40—12:30	<p>Workshop Presentation 1</p> <p><i>Part 1 of Module 3</i></p> <ul style="list-style-type: none"> ➤ <i>The role of wastewater fees</i> ➤ <i>Private Sector Participation</i> ➤ <i>“Making sanitation a business”</i> ➤ <i>The Business Model Concept</i> ➤ <i>Operation costs</i> ➤ <i>The role of public bodies</i> <p><i>Mr. Frank Pogade and Andreas Schmidt</i></p>
12:30-13:00	<p>Breakout Rooms - Group work discussion & Presentation of Results</p> <p><i>Group work discussion in breakout rooms (3 or 4 work groups)</i></p> <p><i>Mr. Frank Pogade</i></p> <p><i>Mr. Andreas</i></p> <p><i>Mr. Steffen Niemann</i></p> <p><i>Ms. Suzan Taha</i></p> <p><i>All participants split in working groups with moderators</i></p> <p><i>12.30-12:50</i></p> <p><i>12:50-13:00</i></p> <p>Presentation of working groups' results in plenary sessions</p>

13:00-13:20	Coffee Break (20 mins)
13:20-13:50	<p>Presentation of Guest Speaker</p> <p><i>Innovative demonstrations on sustainable integrated management of wastewater and reclaimed water use</i></p> <p><i>Jane Hilal / Applied Research Institute Jerusalem – ARIJ</i></p> <p>Q&A</p> <p><i>Facilitator: Mr. Frank Pogade</i></p>
13:50-14:45	<p>Workshop Presentation (Continued)</p> <p>Part 2 of Module 3</p> <ul style="list-style-type: none"> ➤ <i>O&M and HR considerations</i> ➤ <i>Maintenance tools and activities</i> ➤ <i>Video 1 and 2</i> ➤ <i>SOPs</i> ➤ <i>Documentations and record keeping</i> ➤ <i>Staffing and HR requirements</i> ➤ <i>Carbon credits, Video 3</i> <p><i>Mr. Frank Pogade and Andreas Schmidt</i></p>
14:45-15:00	Q&A and Wrap-up

Regional training on Wastewater Treatment for Reuse

Activity Number: RW-5-REG

Module 4:

Incentives to Improve Attractiveness of Reuse

(June 9, 2022)

From 11:30 to 15:30 pm Athens time (CEST+1)

(Video-conference)

PROGRAMME

11:15-11:30	Access to the video-conference / testing of connections and equipment
11:30-11:40	Welcome
	<p>Welcome and Summary of Module 3</p> <p><i>Mr. Frank Pogade, Senior Wastewater Expert & Technical coordinator, Non-key Expert, WES</i></p> <p>Overview on the program for today</p>
11:40—13:00	Workshop Presentation 1
	<p>Part 1 of Module 4</p> <ul style="list-style-type: none"> ➤ Non-technical, institutional and organizational preconditions for decentralized wastewater treatment and reuse ➤ Required legal and regulatory environment ➤ The “Polluter Pays Principle” applied to wastewater reuse ➤ Law enforcement ➤ Q&A <p><i>Mr. Frank Pogade and Andreas Schmidt</i></p>
13:00-13:30	Breakout Rooms - Group work discussion & Presentation of Results
13.00-13:20	<p>Group work discussion in breakout rooms (3 or 4 work groups)</p> <p><i>Mr. Frank Pogade</i></p> <p><i>Mr. Andreas</i></p> <p><i>Mr. Steffen Niemann</i></p> <p><i>Ms. Suzan Taha</i></p> <p><i>All participants split in working groups with moderators</i></p>
13:20-13:30	Presentation of working groups’ results in plenary sessions



13:30-13:50	Coffee Break (20 mins)
13:50-14:20	Presentation of Guest Speaker
	<p>Mr Wassem Mushtaha / Oxfam</p> <p><i>Reuse of Treated Wastewater for Agricultural Irrigation in Southern Gaza Strip</i></p> <p>Q&A</p> <p><i>Facilitator: Mr. Andreas Schmidt</i></p>
14:20-14:50	Workshop Presentation (Continued)
	<p>Part 2 of Module 4</p> <ul style="list-style-type: none"> ➤ <i>The water, energy and food security nexus (Guest)</i> ➤ <i>Knowledge Management and Institutional Learning in decentralised wastewater management and reuse</i> <p><i>Mr. Frank Pogade and Andreas Schmidt</i></p>
14:50-15:00	Q&A and Wrap-up
15:00-15:10	Post-training Knowledge Test
15:10-15:15	Workshop Evaluation
15:15-15:30	Closing of Training
	<i>Suzan TAHA, WES Key Water Expert</i>

14.2 QUIZ FORMS

Pre-training Baseline Evaluation and Final Test of Regional Training on Waste Water Treatment for Reuse / Évaluation de base avant la formation et test final de la formation régionale sur le traitement des eaux usées en vue de leur réutilisation

Workshop Title / Titre de l'atelier	Waste Water Treatment for Reuse / Traitement des eaux usées en vue de leur réutilisation
Date / Date	
Venue Location / Emplacement du lieu	
Participant Name / Nom du participant(e)	
Participant Title/ Position / Titre/poste du participant	
Participant Country / Pays du participant	

INSTRUCTIONS:

Please respond to the questions below by choosing one or more answer/choice per question. / Veuillez répondre aux questions ci-dessous en choisissant une ou plusieurs réponses/choix par question.

- The correct answer may be just one of the choices or as many as all of the choices, depending on the question. / La bonne réponse peut être un seul des choix ou tous les choix, selon la question.
- If the question specifies how many answer choices to select, select exactly that number of choices. / Si la question précise le nombre de choix de réponses à sélectionner, choisissez exactement ce nombre de choix.
- No credit is given unless you select all of the correct choices and no others. / Aucun crédit n'est accordé si vous ne sélectionnez pas tous les choix corrects et aucun autre.
- If answers are only "half correct", no points are given. / Si les réponses sont seulement "à moitié correctes", aucun point n'est accordé.

Your feedback is sincerely appreciated. Thank you. / Vos commentaires sont sincèrement appréciés. Merci.

		What are the specific advantages of the SBR technology? (select all correct answers) / Quels sont les avantages spécifiques de la technologie du réacteur séquentiel discontinu (SBR) ? (sélectionnez toutes les bonnes réponses)
		Very low energy demand / Très faible demande d'énergie
		No SCADA system required / Aucun système SCADA ((système de contrôle et d'acquisition de données) requis
		No primary settlement required / Aucun règlement primaire requis
		Relatively small footprint compared to other activated sludge technologies / Empreinte au sol relativement faible par rapport aux autres technologies de boues activées

		What would be a typical share of investment costs for the sewer system in a <u>centralised</u> WW management and treatment scheme ? / Quelle serait la part
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		typique des coûts d'investissement pour le réseau d'égouts dans un système <u>centralisé</u> de gestion et de traitement des eaux usées ?
		Around 5% / environ 5 %.
		10 – 20%
		60-80%
		More than 90% / Plus de 90 %

		Which ww treatment technology / module does not produce sludge that needs to be treated further? (select only one answer) / Quelle technologie / module de traitement des eaux usées ne produit pas de boues qui doivent être traitées ultérieurement ? (sélectionnez une seule réponse)
		Oxidation ditch / Fossé d'oxydation
		SBR / réacteur séquentiel discontinu (SBR)
		Constructed wetland (vertical flow) / Zone humide construite (écoulement vertical)
		ABR / réacteur anaérobie à chicanes (RAC)

		Which of the treatment technologies below features the highest specific power consumption? (select only one answer) / Laquelle des technologies de traitement ci-dessous présente la consommation d'énergie spécifique la plus élevée ? (sélectionnez une seule réponse)
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		ABR / réacteur anaérobie à chicanes (RAC)
		CW / zones humides construites (ZHC)
		SBR / réacteur séquentiel discontinu (SBR)
		Biogas digester / Digesteur à biogaz

		Which conditions below may result in operational problems? (select all correct answers) / Quelles conditions ci-dessous peuvent entraîner des problèmes opérationnels ? (sélectionnez toutes les bonnes réponses)
		pH of ww under 4 / pH des eaux usées inférieur à 4
		WW temperature between 20 and 30 degrees Celsius / Température des eaux usées entre 20 et 30 degrés Celsius
		High content of fat and oil in the ww / Contenu élevé de graisses et d'huiles dans les eaux usées
		Highly diluted ww (stormwater) / Eaux usées fortement diluées (eaux pluviales)

		What is the typical life span of a submerged wastewater pump of good quality? (select only one answer) / Quelle est la durée de vie typique d'une pompe immergée pour eaux usées de bonne qualité ? (sélectionnez une seule réponse)
		Under 1 year / Moins d'un an
		1 – 2 years / 1 à 2 ans

		3 to 8 years / 3 à 8 ans
		Up to 20 years / Jusqu'à 20 ans

		Which sort of wastewater you would <u>not</u> accept in your DWWT plant even in small volumes (Your plant has been designed for standard domestic wastewater) ? (select all correct answers) / Quel type d'eaux usées n'accepteriez-vous <u>pas</u> dans votre station d'épuration des eaux usées (STEP), même en petites quantités (votre station a été conçue pour les eaux usées domestiques standard) ? (sélectionnez toutes les bonnes réponses)
		WW from a dairy factory (BOD around 300 mg/l) / Eaux usées d'une laiterie (demande biochimique en oxygène (DBO) environ 300 mg/l)
		WW from a metal plating workshop / Eaux usées d'un atelier de métallisation
		WW from a slaughterhouse (BOD around 3000 mg/l) / Eaux usées d'un abattoir (DBO environ 3000 mg/l)
		WW from schools (BOD around 150 mg/l) / Eaux usées des écoles (DBO environ 150 mg/l)
		WW from olive oil production / Eaux usées provenant de la production d'huile d'olive

		Which stakeholders are usually part of a monitoring scheme? (select 3 correct answers) / Quelles sont les parties prenantes qui font généralement partie d'un programme de suivi ? (sélectionnez 3 bonnes réponses)
		Operator / L'opérateur
		Water authorities / Les autorités responsables de l'eau

		Professional "Community of practice" / La "communauté de pratique" professionnelle
		External laboratory / Laboratoire externe
		Law enforcement / L'application de la loi
		Policy makers / Les décideurs politiques

		How to measure MLSS? (select all correct answers) / Comment mesurer les matières solides en suspension dans la liqueur mixte (MSSL) ? (sélectionnez toutes les bonnes réponses)
		Laboratory Tests / Essais de laboratoire
		Site Settling Jars / Pots de décantation de sites
		Portable SS Monitor / Moniteur SS portable
		Fixed installation Monitor / Installation fixe moniteur

		Selection of wastewater treatment technology, why is it important that local available skill and parts for installation and operation are locally available? (select 2 correct answers) / Lors du choix de la technologie de traitement des eaux usées, pourquoi est-il important que les compétences et les pièces nécessaires à l'installation et au fonctionnement soient disponibles localement ? (sélectionnez 2 réponses correctes)
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		To maintain local business relationships / Entretenir des relations commerciales locales
		To be independent from imports / Être indépendant des importations
		To develop local capacities / Développer les capacités locales
		External knowledge and skills are often not accepted / Les connaissances et compétences externes ne sont souvent pas acceptées

		What are major challenges with decentralized wastewater treatment system? (select all correct answers) / Quels sont les principaux défis du système de traitement décentralisé des eaux usées ? (sélectionnez toutes les bonnes réponses)
		The systems are too expensive / Les systèmes sont trop chers
		The operation control of high number of installations / Le contrôle de l'exploitation d'un grand nombre d'installations
		No challenges because all are operated by plot owners / Aucun défi car tous sont exploités par les propriétaires de parcelles
		Finding discharge option for the treated effluent / Trouver une option de décharge pour l'effluent traité

		<p>Differences between faecal sludge (FS) and municipal wastewater? (select all correct answers) / Différences entre les boues fécales (BF) et les eaux usées municipales (sélectionnez toutes les bonnes réponses)</p>
		<p>Composition more or less the same but higher concentrated / Composition plus ou moins identique mais plus concentrée</p>
		<p>No much differences / Pas beaucoup de différence</p>
		<p>FS is mainly collected by vacuum trucks and wastewater by pipes / Les BF sont principalement collectés par des camions aspirateurs et les eaux usées par des canalisations.</p>
		<p>COD/BOD ratio 3-5 times higher in FS than in municipal wastewater / Le rapport DCO/DBO est 3 à 5 fois plus élevé dans les SF que dans les eaux usées municipales.</p>

		<p>Impact of chemical Nitrogen compounds in the environment? (select 2 correct answers) / Impact des composés chimiques de l'azote dans l'environnement ? (sélectionnez 2 bonnes réponses)</p>
		<p>No negative impact because is needed to grow biomass (trees, crops, ...) / Pas d'impact négatif car il est nécessaire de faire pousser de la biomasse (arbres, cultures, ...)</p>
		<p>Nitrite in groundwater pollutes drinking water resources / Les nitrites présents dans les eaux souterraines polluent les ressources en eau potable</p>
		<p>An overdose of N leads to an uncontrolled biomass growth in water bodies / Une surdose d'azote entraîne une croissance incontrôlable de la biomasse dans les masses d'eau.</p>

		No nitrogen compounds emission through municipal wastewater / Pas d'émission de composés azotés par les eaux usées municipales
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		Is it worth separating nutrient at source (household level) and reuse as a centralized treated and concentrated fertilizer? (select all correct answers) / Cela vaut-il la peine de séparer les nutriments à la source (au niveau des ménages) et de les réutiliser comme engrais centralisé, traité et concentré ? (sélectionnez toutes les bonnes réponses)
		No, it is too expensive / Non, c'est trop cher
		No, too much uncontrolled health risk to the community / Non, trop de risques sanitaires non contrôlés pour la communauté
		Yes, it eliminates nutrients at source and simplifies the wastewater treatment process and related costs / Oui, il élimine les nutriments à la source et simplifie le processus de traitement des eaux usées et les coûts qui y sont liés
		Yes, nutrient can be controlled separated, treated, transported and effectively applied where and when needed / Oui, les nutriments peuvent être contrôlés, séparés, traités, transportés et appliqués efficacement là où ils sont nécessaires.

		What are the main challenges with chlorination of wastewater? (select 2 correct answers) / Quels sont les principaux défis posés par la chloration des eaux usées ?(sélectionnez 2 bonnes réponses)
		Potential health risk for the operator / Risque potentiel pour la santé de l'opérateur

		Hardly any challenges, it is the most common disinfection concept for wastewater / Ne pose pratiquement aucun problème, c'est le concept de désinfection le plus courant pour les eaux usées.
		Supply chain for chlorine for disinfection / Chaîne d'approvisionnement en chlore pour la désinfection
		To control the free chlorine concentration in the final effluent / Pour contrôler la concentration de chlore libre dans l'effluent final

		What means restricted reuse application of wastewater? (select all correct answers) / Que signifie l'application de la réutilisation restreinte des eaux usées ? (sélectionnez toutes les bonnes réponses)
		The use of reclaimed water to irrigate edible food crops / L'utilisation de l'eau récupérée pour l'irrigation des cultures alimentaires comestibles
		The use of reclaimed water to irrigate edible non-food crops / L'utilisation d'eau récupérée pour l'irrigation de cultures non alimentaires comestibles
		The use of reclaimed water in areas with public people have no access / L'utilisation d'eau recyclée dans des zones où le public n'a pas accès.
		The use of reclaimed water to produce portable water / L'utilisation d'eau récupérée pour produire de l'eau potable