Concept Note

Study Visit on Leachate management

(ST-4)

Combined with the:

- National activity for Lebanon "Training on the Management of Leachate".

- Peer-to-Peer exchange (P2P-6) on Management of Industrial waste to address the acute problem of hazardous substances disposal (focus on leachate management)

Gefinor Rotana Hotel
Beirut, Lebanon
June 25-29, 2018

SWIM and Horizon2020 Support Mechanism

in collaboration with the Ministry of Environment of Lebanon

1 INTRODUCTION: THE SWIM-H2020 SM

The SWIM and H2020 SM is a Regional Technical Support Program, funded by the European Commission, 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. 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 Clima 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.

2 BACKGROUND

2.1 INTRODUCTION

The selection of the Project themes and activities was made according to the Work Programme of Horizon2020 (2015-2020), developed during phase I of the project Horizon 2020 CB/MEP, the ToRs for SWIM-H2020 SM issued by the European Commission and the views expressed by the countries and stakeholders during the fact finding missions (inception phase). The Project Workplan was approved at a first step by the EUDs and the Commission and endorsed at a second step during the Steering committee meeting held in Brussels (27-28 September 2016).

A total of 15 (fifteen) regional on-site training activities and 6 (six) study tours with participants from most/all PCs were incorporated in the Project Work Plan.

This activity will be implemented under the H2020 Component of the project and clustered in the Project Work Plan under WP3: Training Activity, ST-4: Study Tour to visit different types of state-of-the-art Hazardous Waste Management Facilities. It will be implemented under the "Industrial Pollution and Hazardous Waste" theme and the topic of focus is "Sustainable Leachate Management".
A Peer-to-Peer exchange activity will also be launched during the ST-4 which is clustered in the Project Work Plan under WP2, P2P-6: Management of Industrial waste to address the acute problem of hazardous substances disposal (focus on leachate management). This study tour is also linked to the SWIM-H2020 SM national activity for Lebanon "Training on the Management of Leachate".

This study tour aims to reinforce the capacities of decision-makers and technical staff on the integrated approach to the sustainable management of leachate based on state-of-the-art technologies and best practices including planning, finance and procurement options. It will support them to better evaluate the existing situation at legal, institution and technical levels in their countries/regions and upscale them specifically through interesting case studies from Lebanon (existing, under construction and planned infrastructures).

2.2 REGIONAL CONTEXT

Despite initiatives for enhanced recycling and waste utilization in the MENA region, landfilling still represents the dominant disposal path for municipal solid waste (MSW). Various types of waste are disposed into unsanitary landfill sites without any separation or classification of hazardous and non-hazardous waste. The constituents of the MSW undergo biological and chemical degradation after disposal, resulting in emissions of landfill gas and discharge of leachate, a highly polluted form of wastewater. The leachate from unsanitary landfills has complex characteristics that are dependent on the composition of solid waste in the landfill. When discharged into the environment, leachate poses serious threats to human health and the ecosystem. Leachate is also generated as a consequence of rainwater percolation through wastes, chemical biological processes in waste and the inherent water content of wastes themselves. Furthermore, landfill leachate generation remains continuous when water comes in contact with the solid waste.

Some examples of the leachate problem in the Mediterranean, and the relevance of ST-4, are as follows: In Tunisia, the largest landfill "Jebel Chakir" receives on a daily basis, 1800 tons of MSW of which 65% are organic matter[1]. The high moisture values in MSW contribute to the production of large quantity of leachate. The leachate is collected with high density polyethylene pipes and stocked in 13 storage basins of total capacity 130,000 m^3. In Jordan, one objective for the "Al Ghabawi landfill" expansion project is to upgrade the landfill and generate electricity while mitigating Green House Gases Emissions. Another key component of the project is to upgrade the leachate treatment system. The call for tenders was published

1 Landfill Leachate Generation and Its Impact on Water at an Urban Landfill(Jebel Chakir, Tunisia)- 2012- Aydi Abdelwaheb*, Zairi Moncef and Ben Dhia Hamed

in early 2017 and the project is underway[2]. In Morocco, the public discharge of Kénitra city receives around 120000 tons/year of waste which generate large volumes of leachate. The environmental impacts of landfills and dumpsites depend on several factors, including waste composition, technical barriers, landfill operation and climatic conditions. The characterization of leachate generated by the Kénitra landfill showed that it is conveying an important mineral pollutant load, organic, metallic and microorganisms. These leachates of high pollution load could contaminate groundwater and surface water because the discharge is near the Sebou river and also presents a risk of contamination of bathing waters across the groundwater flow toward the ocean[3].

The environmental risks of leachate generation arise from it escaping into the environment around landfills, particularly to watercourses and groundwater. These risks can be mitigated by properly designed and engineered landfill sites. As the MENA countries are beginning to adopt modern solid waste management practices either through creating new facilities or by upgrading existing dumpsites and unsanitary landfills, leachate management requires special attention dealing with treatment technologies, operation procedures and procurement options.

2.3 TARGET GROUP

This activity will target up to 12 decision-makers and technical staff (two from each of the following partner countries: Algeria, Egypt, Jordan, Morocco, Palestine, Tunisia) as follows:

- One representative from the National Ministry or the Public Agency responsible for the design of leachate treatment plants;
- One representative from a regional or local authority in charge of the monitoring or operation of solid waste infrastructures and leachate management plants.

The trainees from Lebanon (linked to EFH-LB-2) are expected to be competent decision-makers and technical staff from the Ministry of Environment, Ministry of Energy and Water, Ministry of Agriculture, Ministry of Industry, Ministry of Interior and Municipalities, Council for Development and Reconstruction (CDR), Municipalities, Researchers, Industrial Research Institute (IRI), National Council for Scientific Research (CNRS), civil society.

2 Landfill Modernisation and Expansion, Including Construction of Cell No 5, Gas Management and Generation Facilities (al Ghabawi), Including Leachate Treatment Plant, Jordan http://www.tendersinfo.com/details/38550467?desc=Landfill-Modernisation-And-Expansion,-Including-Construction-Of-Cell-No-5,-Gas-Management-And-Generation-Facilities-(al-Ghabawi),-Including-Leachate-Treatment-Plant

3 Physicochemical and bacteriological characterization of discharge's leachate of Kénitra in Morocco- Scholars Research Library 2016- Naoual Tchicha, Aouatif Benalib, Rajaa Amiyarea*, Abdelaziz Zouahrib, Mohamed Bouksaimb Mohamed Ouhssinea and Abdelaziz Chaoucha

3 OBJECTIVES AND EXPECTED RESULTS

3.1 OBJECTIVES

The overall aim of the study tour in the framework of the regional activities on Industrial Pollution and Hazardous Waste Management is to bring key stakeholders from the participating countries together with selected experts and provide a high-level learning experience which will include training, exercises and discussions combined with site visits focusing on leachate management.

The specific objectives of the activity are to:

- Enhance the capacities of the trainees on the integrated approach to the sustainable management of leachate based on state-of-the-art technologies and best practices including planning, finance and procurement options;
- Provide a hands-on experience by visiting at least two leachate management facilities with particular emphasis on the adaptation of technologies to the context of the region;
- Enable, encourage, and facilitate dialogue and exchange of experiences between public officials (or other key stakeholders) from the partner countries and the development of synergies and complementary activities within the Mediterranean;
- Launch a peer-to-peer process for experience sharing at regional level and knowledge transfer (south-to-south, north-to-south) around Leachate management and technologies for the MENA.

3.2 APPROACH TO MEET OBJECTIVES

In order to achieve the study tour objectives, a dynamic, comprehensive, interactive, facilitated and participatory approach will be adopted, in delivering the following:

- Presentation of appropriate legislative and economic instruments employed to encourage the sustainable management of leachate (various case studies from MENA and EU);
- Presentation of recent developments and innovative approaches on leachate Management and procurement options (various case studies);
- Field visits to leachate management plants, presentation of technologies and discussion on procurement and contractual alternatives;
- Presentation of selected cases from SWIM-H2020 SM partner countries' in order to stimulate discussions and identify potential synergies;
- Interactive workshop session to discuss questions and problems encountered in order to identify common themes; launch of peer-to-peer process/focus.

Below are the specific subjects that will be addressed:

- Sanitary landfills basics
- Leachate generation and composition
- Leachate treatment overview
- Leachate biological treatment
- Physical/chemical treatment
- Thermal treatment systems
- Membrane technology
- Assessment of treatment options
- Introducing the three case studies and field visits
- Discussion on lessons learned
- Environmental assessment of leachate treatment projects
- Leachate projects: procuring the services of consultants
- Model tender document
- Project Delivery Methods
- Leachate projects critical success factors

3.3 EXPECTED OUTCOMES

- Key stakeholders of the partner countries have strengthened capacity in sustainable leachate management, by improved knowledge on:
  - State of the Art of leachate treatment technologies (different applicable/implemented treatment techniques with their advantages and weaknesses/including financial and economic aspects);
  - Leachate Project Management;
  - Specific case studies;
  - Specific sites visited.
- A peer-to-peer process for experience sharing at regional level and knowledge transfer (south-to-south, north-to-south) around sustainable leachate management is launched or enhanced.

3.4 LINKAGE WITH SWIM & HORIZON 2020 SUPPORT MECHANISM ACTIVITIES

As already mentioned, this Study Tour (ST-4) will be combined with the national activity EFH-LB-2: Training on the management of leachate. It was during the inception mission of this activity, that the site visits and respective Lebanese experiences were acknowledged as very appropriate to be shared with the rest of the Partner Countries.

The Peer-to-Peer exchange (P2P-6) on the Management of industrial waste to address the acute problem of hazardous substances disposal (focus on leachate management) aims to establish networks of peers of different stakeholders in the region, mobilise knowledge in the field of Industrial and Solid Waste and learn from other parties' experiences and best practices in topics related to Leachate management, enabling structured collaboration between countries/experts. It aims at building on the international and regional successful experience and address the challenges faced by Mediterranean countries and possibly scale up and replicate innovative solutions in this field. It offers virtual connections between participants within the region and will highlight the Leachate management success stories of partner and/or EU countries.

A session of the study tour will be dedicated to the design, focus and modalities of the Peer-to-Peer activity. The SWIM-H2020 SM team will coordinate the start-up of the activities, and will support/monitor/ follow-up till the end of 2018. The following tentative schedule is proposed:

Step 1 (March-May 2018): The Peers are appointed by the FPs and are ideally also the trainees attending ST-4;

Step 2 (June 2018): During the study tour (ST-4) in Lebanon a brainstorming session will identify and agree on the focus and modalities of the Peer-to-Peer activity;

Step 3 (1-2 months): Prepare and circulate a short concept note on P2P-6 including a tentative schedule, methodology, expected outputs/achievements from the process, etc.;

Step 4 (4 months): Implementation of P2P-6 over a 4-month period;

Step 5 (1 month): Final Report on P2P-6.

4 LOCATION, TIME AND LOGISTICS

4.1 LOCATION

ST-4 is planned to be held in Beirut, Lebanon at the Gefinor Rotana Hotel. A field/study visit will also take place on day 3 of the 5-day training to other localities in Lebanon.

4.2 IMPLEMENTATION DATES

ST-4 will be organised over five consecutive days, with travels on the day before and after (7 days in total) **scheduled from 25 to 29 June 2018.**

4.3 LOGISTICS

SWIM-H2020 SM will arrange all logistics for the training including travel, local transportation, accommodation and catering. Interpretation of English/French will be available (whisper translation during the field visit).

5 INSTRUCTORS OF THE COURSE

Three esteemed SWIM-H2020 Support Mechanism experts in solid waste management and leachate treatment will deliver the course:

Dr Ahmad GABER, Senior environmental and sustainable development policy advisor, planner, and project manager, with more than 30 years of consulting experience. Chairman of Chemonics Egypt Consultants. Dr Gaber will coordinate the overall training course.

Mr Stavros VLACHOS, Technical expert on Hazardous Waste Management. Technical Manager at EMICERT ltd, Greek Verification Body. Consultant at Envirometrics ltd, Technical Consultants.

Mr Abderrahmane MALOUM, Senior Solid Waste Expert with a longstanding professional experience as an engineer in the private sector specifically in terms of design and construction of more than 16 Leachate Treatment Plants.

6 TRAINING AGENDA (main venue: Gefinor Rotana Hotel)

Day 1: Monday June 25, 2018

Session	Time	Description	Speaker
	08:30 –09.00	**Registration**	
#1	09:00-09:30	Opening session and welcoming remarks Course overview	M. Anis Ismail Dr. Ahmad Gaber
#2	09:30-11:00	Lecture 1: Sanitary landfills - basics	M. Abderrahmane Maloum
#3	11:00 – 12:00	Lecture 2: Leachate generation and composition	M. Abderrahmane Maloum
	12:00 – 13:00	**Lunch Break**	
#4	13:00-14:00	Lecture 3: Leachate treatment overview	M. Abderrahmane Maloum
#5	14:00 – 15:30	Lecture 4: Leachate biological treatment	Dr. Ahmed Gaber
#6	15:30-16:00	Wrap- up	Dr. Ahmad Gaber

Day 2: Tuesday June 26, 2018

Session	Time	Description	Speaker
#7	09:00-09:30	Introduction to day 2	Dr. Ahmad Gaber
#8	09:30-11:00	Lecture 5: Physical/chemical treatment	Dr. Ahmed Gaber
#9	11:00 – 12:00	Lecture 6: Thermal treatment systems	M. Abderrahmane Maloum
	12:00 – 13:00	**Lunch Break**	
#10	13:00-14:00	Lecture 7: Membrane technology	M. Abderrahmane Maloum
#11	14:00 – 15:30	Lecture 8: Development of leachate treatment sequence	M. Abderrahmane Maloum
#12	15:30-16:00	Wrap- up	Dr. Ahmad Gaber

Day 3: Wednesday June 27, 2018

Session	Time	Description	Speaker
#13	09:00-09:15	Introduction to day 3	Dr. Ahmed Gaber
#14	09:15-10:15	Lecture 9: Introducing the three case studies and site visits	Local Consultants
	10:15 – 10:30	**Coffee Break**	
#15	10:30-16:30	Site Visit #1. Costa Brava advanced treatment plant Site Visit #2. The treatment scheme applied at Naamah landfill site	
	16:30 – 17:30	**Coffee Break back at the hotel**	

Day 4: Thursday June 28, 2018

Session	Time	Description	Speaker
#16	09:00-09:30	Introduction to day 4	Dr. Ahmad Gaber
#17	09:30-11:00	Lecture 10: Lessons learned: open discussion	Dr. Ahmad Gaber & TBN
#18	11:00 – 12:00	Lecture 10 (Cont.): Lessons learned: open discussion	Dr. Ahmad Gaber & TBN
	12:00 – 13:00	Lunch Break	
#19	13:00-14:00	Lecture 11: Environmental assessment of leachate treatment projects	M. Stavros Vlachos
#20	14:00 – 15:30	Lecture 12: Leachate projects: procuring the services of consultants	M. Stavros Vlachos
#21	15:30-16:00	Wrap- up	Dr. Ahmad Gaber

Day 5: Friday June 29, 2018

Session	Time	Description	Speaker
#22	09:00-09:30	Introduction to day 5	Dr. Ahmad Gaber
#23	09:30-11:00	Lecture 13: Project Delivery Methods	M. Stavros Vlachos
#24	11:00 – 12:00	Lecture 14: Model tender document: Monmouth County Project	Dr. Ahmad Gaber
	12:00 – 13:00	Lunch Break	
#25	13:00-14:00	Lecture 15: Leachate projects critical success factors	Dr. Ahmad Gaber
#26	14:00 – 15:30	Lecture 16: Course evaluation, follow-up and P2P process	Dr. Ahmad Gaber M. Anis Ismail
#27	15:30-16:00	Concluding remarks and closing session	Dr. Ahmad Gaber M. Anis Ismail