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Water and Environment Support

in the ENI Southern Neighbourhood region
A



RE-4-ST

Study Visit to Marseille on the sustainable management of Construction and Demolition Waste **Report on the Study Visit combined with a workshop (D4)**

January 2023

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v.1	<i>RE-4-ST - Study Visit to Marseille on the sustainable management of Construction and Demolition Waste Report on the Study Visit combined with a workshop (D4)</i>	<i>Françoise Bonnet</i>	<i>Anis Ismail</i>

WATER AND ENVIRONMENT SUPPORT IN THE ENI SOUTHERN NEIGHBOURHOOD REGION

The "Water and Environment Support (WES) in the ENI Neighborhood 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 the 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 SM, SWIM-H2020 SM) and strives to create a supportive environment and increase capacity all stakeholders in the partner countries (PCs).

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

Being a regional project, WES has foreseen a set of regional activities, mostly technical assistance actions and capacity building workshops, study visits, webinar and Peer-to-Peer (P2P) activities. As a part of the WES project workplan for the first year (2019-2020) related to the Regional Activities, a "Regional activity on Management of Construction and Demolition Waste (C&DW)" was envisaged to be launched by WES. Due to the COVID 19 pandemic crises, this regional activity has been postponed until conditions for physical presence of participants were to be in place.

DISCLAIMER:

This publication was produced with the financial support of the European Union. Its contents are the sole responsibility of the WES Project and do not necessarily reflect the views of the European Union.



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ABBREVIATIONS

CDW	Construction and demolition waste
EU	European Union
MENA	Middle East and North Africa
PC	Partner Countries
P2P	Peer-to-Peer

1 GENERAL INTRODUCTION

The construction industry is one of the most significant industries which contribute to the social and economic development of every country. Nevertheless, construction and demolition waste (CDW), which contributes about 50% of the total global annual generated solid waste (SW), represents a growing challenge for countries to face with. CDW contains a wide variety of materials generated by construction and demolition of buildings and infrastructure, as well as road planning and maintenance, such as concrete, bricks, wood, glass, metals, and plastic. Some components of CDW have a high resource value, while others may have a lower value, but could still be reprocessed into new products or materials to be utilized in construction and infrastructure projects. Increased living standard, rapid urbanization, and expansion of “infrastructures” (roads, airports, etc.) have brought a construction “boom” in most of the countries of the MENA region, resulting in a considerable increase of CDW quantities. This has become an escalating problem in the MENA region characterized by predominance of unsustainable CDW practices: CDW is dominantly disposed in open spaces, without planning, and therefore causing serious negative impacts on society, environment, and economy. The main barriers¹ to the proper management of CDW are absence of standardization and efficient practices, lack of effective policies and education, deficiencies in awareness, low profit margins, and lack of technical and financial resources. Overview² of the existing CDW management practices shows that all those barriers exist in the MENA region countries, implying overwhelming need for finding sustainable solutions.

1.1 RATIONALE OF THE ACTIVITY

This WES regional activity is dedicated to supporting regional efforts towards improving the CDW management through identification and presentation of technologies and schemes already tested on the ground in the EU and Mediterranean region and suitable to be transferred in the MENA region. It is intended to inform about how to maximize the sustainability of CDW management, to demonstrate design/processes/operations leading to reductions in the environmental impact of CDW and to demonstrate good/best practice in the environmental performance of site activities. It combines a Peer-to-Peer process and a Study Visit.

The first virtual P2P meeting was organized on the 7th of April 2022 and aimed at introducing all the participants (Peers, Experts, etc.) and consolidating the workplan, roles and expectations. The 2nd virtual P2P meeting was organized on the 16th of June 2022 and aimed at enhancing discussion among Peers on several issues related to C&DW and introducing the host and the envisaged structure of the Study Visit.

As mentioned above, the 3-day regional activity held in Marseille, France on the 20th, 21st and 22nd of September 2023, was embedded within a regional Peer-to-peer activity, which involves direct

¹ According to Daoud O.A et al. “An Investigation into Solid Waste Problem in the Egyptian Construction Industry: A mini-review”, WM&R, 2020

² According to “Challenges and opportunities for solid waste management in the Mashreq and Maghreb Countries” (SWEEP-Net April 2014)

exchange of experiences between and among Peers from relevant institutions in the beneficiary countries and beyond in order to share knowledge, expertise and solutions in the CDW sector, as well as to boost South-South cooperation and to build lasting relations and exchanges.

The present document reports on the Study Visit followed by a one-day Workshop.

2 OBJECTIVES OF THE ACTIVITY

The overall aim of the activity was to bring together the key stakeholders from the PCs with selected experts (Study Visit hosts; WES experts: Mr. Anis Ismail, Mr. Ahmed Jelidi, Mrs. Françoise Bonnet; and invited speakers) and provide a high-level field visit focusing on CDW followed by a training/workshop to discuss outcomes of the visits, needs and challenges.

The specific objectives of the activity were to:

- Identify and analyze the recurrent problematics encountered in the CDW management sector in Southern Mediterranean;
- Identify and analyze relevant existing projects/technologies/initiatives that may answer those problematics to implement them in the concerned territories, stressing environmental and social benefits;
- Introduce to the participants an integrated approach to sustainable management of CDW at local level based on EU standards and applicable best practices;
- Visit CDW management facility(ies) using technology which is effective, relevant and implementable in the WES PCs;
- Enable, encourage, and facilitate dialogue and exchange of experiences between public authorities and other key stakeholders from the PCs with those from the EU;
- Promote sharing of experiences among the PCs on CDW management practices; facilitate exchanges and the development of synergies and complementary activities within the Mediterranean;
- Analyze possibilities for creation of a market for materials recovered from CDW.

3 EXPECTED RESULTS OF THE ACTIVITY

The present report (see following chapters) depicts that the above-mentioned objectives have been sufficiently met. The overall evaluation of the event is 3,6/4 indicating the high satisfaction of the trainees and their expectations being met. In addition, as mentioned in the Terms of Reference, the following progress results have been achieved:

Result 2.1: Location(s) for the Study Visit and workshop are identified

Result 2.2: The program of the Study Visit and workshop is finalized

Result 2.3: Interactive workshop and Study Visit are conducted and reported on

Furthermore, after the Study Visit, the P2P process is continuing since Peers have been contributing to the desk study (task 3) by exchanging relevant good practices from their respective countries.

4 PROGRAM OF THE STUDY VISIT

The program of the Study Visit and the combined interactive workshop was elaborated based on the discussions, consultations and outcomes of the two P2P meetings.

The aim of the Study Visit and interactive workshop was to showcase recent developments and innovative approaches in CDW management while promoting experience exchange among PCs. The visit(s) demonstrated simple technological solutions already tested on the ground in the EU/Mediterranean region and suitable to be transferred in the MENA region. Efforts have been invested in making links with other projects, pre-existing or ongoing, such as RE-MED (see programme in Annex).

The field visits were hosted by the Region Sud – Provence-Alpes-Côte d'Azur, France, ACR+ member.

- **The first day** was dedicated to the visit of the recycling Center and crushing platform of MAT'ILD company in Bouc-Bel-Air, the Sorting platform for Metals, Wood shredding and cardboard of MAT'ILD in Gardanne, the platform for sorting and recycling of inert waste of DURANCE Granulats Company.
- **The second day** was dedicated to the incineration bottom ash treatment platform of MAT'ILD company and ARCELOR Mittal-ECOCEM company in Fosse-sur-Mer.
- **The third day** consisted in an interactive workshop on CDW management where the following was presented:
 - An overview of CDW management in the EU
 - The ENI CBC-MED RE-MED project
 - A deeper insight into the case of Tunisia
 - A PHD thesis on solutions for better collection and management of CDW

The afternoon of the third day was dedicated to group work and a wrap-up of the lessons learnt during the visits and the previous online workshops of the P2P process.

The complete agenda of the three days can be found in Annex.

5 ELEMENTS OF THE WORKSHOP IMPLEMENTATION

No. of presentations on examples/case studies (sharing of experiences, good practices, etc.)	6
No. of international speakers from the Region	4
No. of international speakers from the EU	4
No. of training-oriented presentations (on concepts, methodologies, etc.)	2
No. of interactive/participatory activities (open discussions, brainstorming sessions)	2

6 PROFILE OF THE PARTICIPANTS

This regional activity was designed to benefit national governments (decision makers and administrators involved in different aspects of CDW management in PCs), local authorities, applied research and innovation institutions, and private sector along the value chain (construction companies, entrepreneurs, service providers in SW management, etc.). WES Environment Focal Points were invited to appoint up to four professionals including of course the Peers. As an exception, additional Egyptian trainees participated, in connection to a national WES activity on CDW (that would eventually not be implemented, making their participation in this regional activity particularly meaningful).

Algerian trainees were not able to participate due to visa implications. The total number of trainees was 24 (a complete list is available upon request to the WES support team).

Training Workshop Demographics

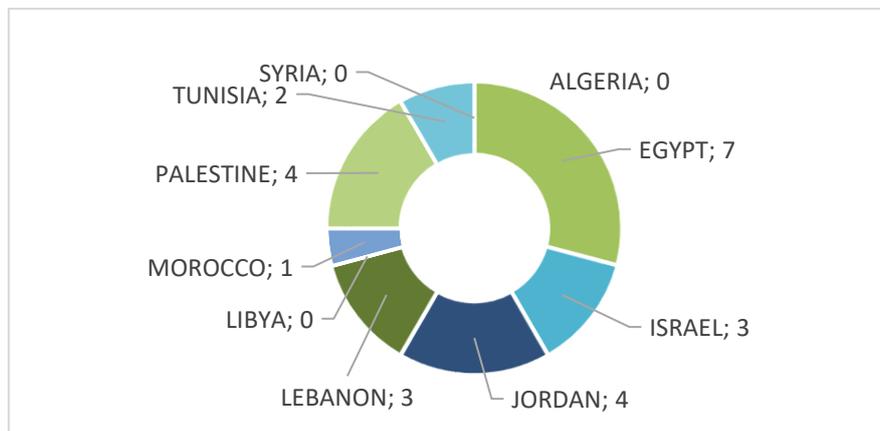


FIGURE 6-1: REPRESENTATION OF TRAINEES PER COUNTRY

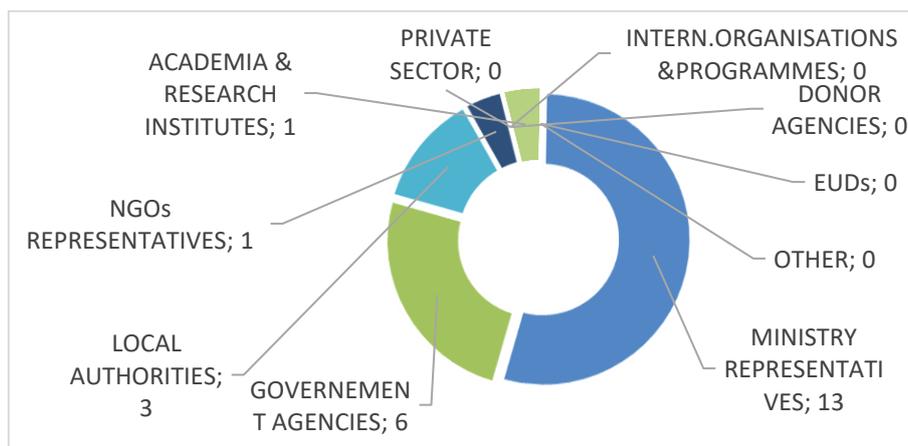


FIGURE 6-2: REPRESENTATION OF TRAINEES PER TYPE OF INSTITUTION

7 STATISTICS GENDER AND YOUTH

In terms of gender balance, the event was within the WES overall high target of 50% +/-10%, as seen below.

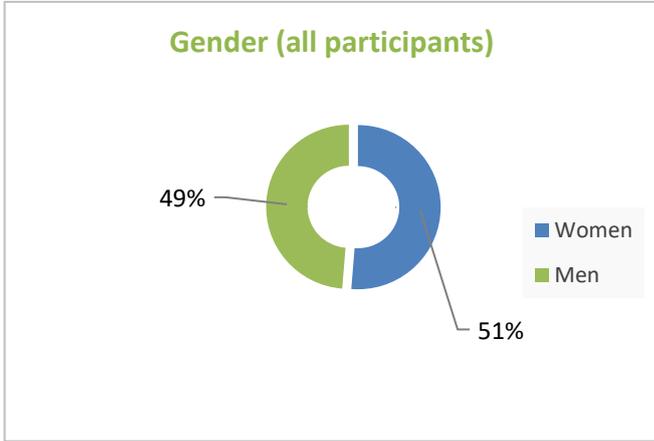


FIGURE 7-1: GENDER (ALL PARTICIPANTS)

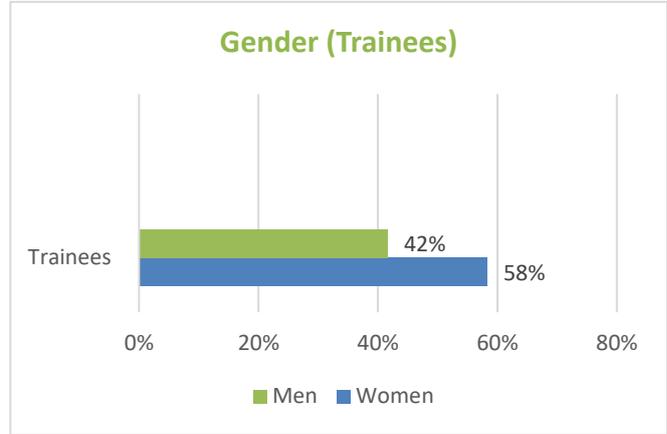


FIGURE 7-2: GENDER (TRAINEES AND OBSERVERS)

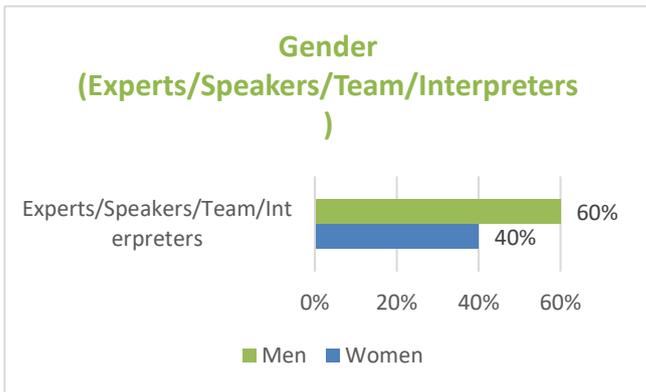


FIGURE 7-3: GENDER (EXPERTS/TRAINERS/WES TEAM)

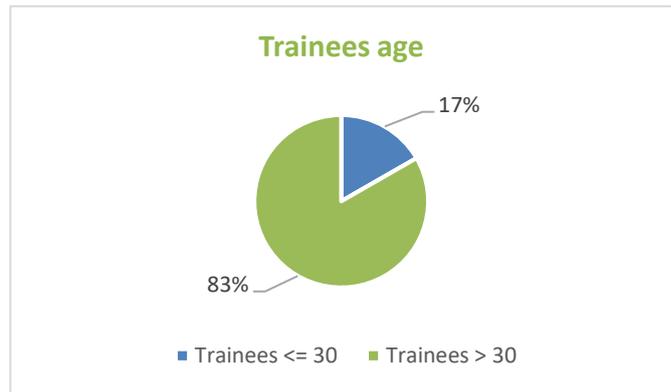


FIGURE 7-4: TRAINEES - AGE

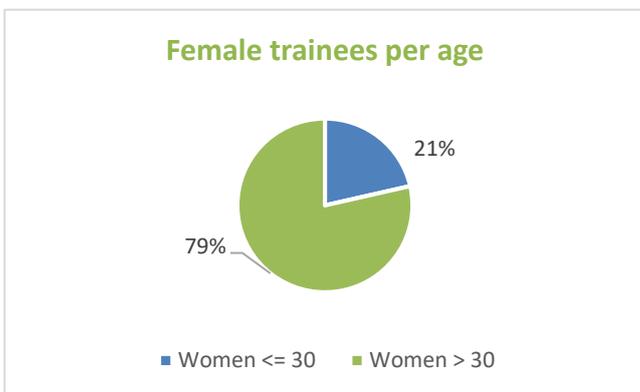


FIGURE 7-5: FEMALE TRAINEES - AGE

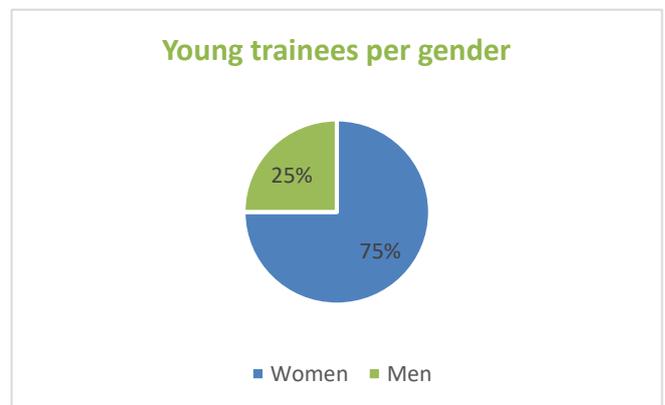


FIGURE 7-6: YOUNG TRAINEES (18-30) - GENDER

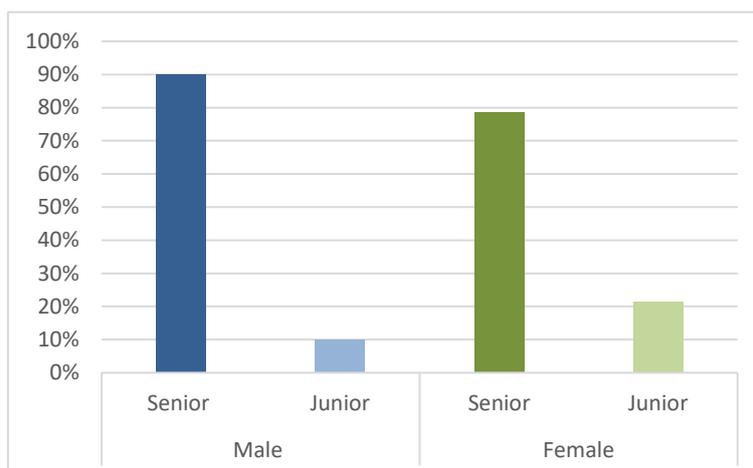


FIGURE 7-7: GENDER - POSITION LEVEL

8 EVALUATION OF THE EVENT

8.1 RESULTS OF THE EVALUATION

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	12	7		1	20	3,50
A2	Efficient logistics: accommodation, transportation, location of venue and interpretation	9	8	3		20	3,30
A3	Provision of support (if requested) for participants’ preparation for the event	10	10			20	3,50
A4	Efficient and effective follow-up of preparations and progress towards the event	13	7			20	3,65
A5	Smooth flow of programme, efficient handling of emerging needs and attentiveness to participants concerns	13	7			20	3,65
A6	Presentations correspond and contribute to the planned objectives and are conducive to enhanced shared understanding and participation on addressed topics	11	9			20	3,55

A7	Clarity, coverage and sufficiency of concepts, objectives, anticipated outputs	10	9	1		20	3,45
A8	Usefulness of the distributed material	7	10	2	1	20	3,15
A9	Efficiency and effectiveness of the facilitation	11	9			20	3,55
A10	Overall rating of the event	12	8			20	3,60

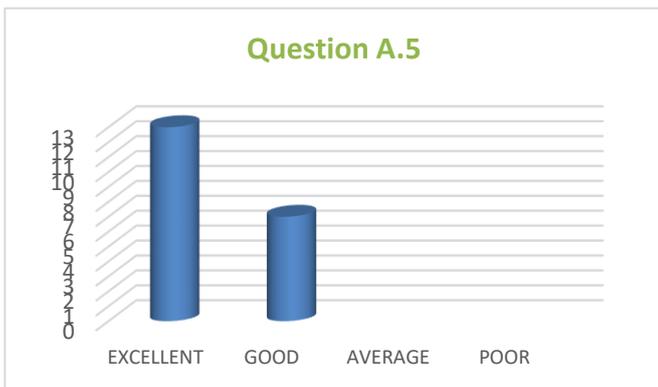


FIGURE 8-1: PLANNING FOR THE EVENT (A.5)

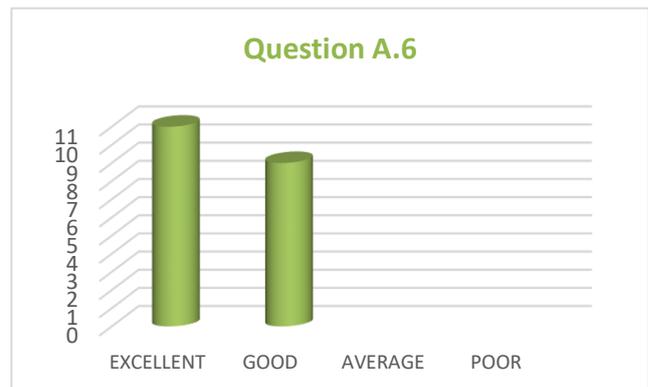


FIGURE 8-2: FLOW OF PROGRAMME, HANDLING OF EMERGING NEEDS (A.6)



FIGURE 8-3: EVALUATION OF PRESENTATIONS (A.7)

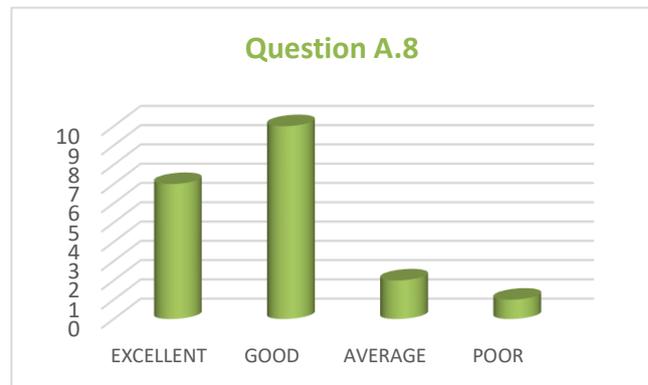


FIGURE 8-4: CLARITY, COVERAGE AND SUFFICIENCY OF CONCEPTS, OBJECTIVES, ANTICIPATED OUTPUTS (A.8)

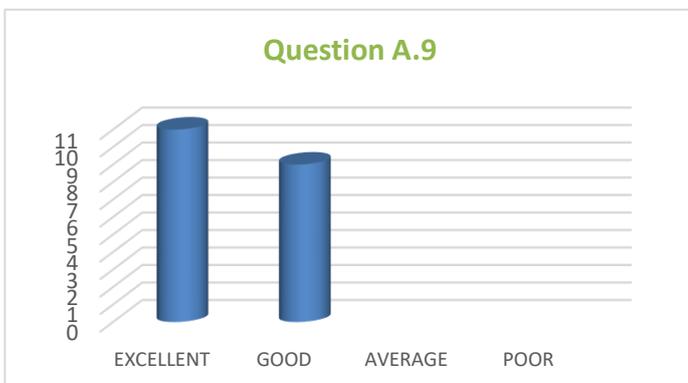


FIGURE 8-5: USEFULNESS OF THE DISTRIBUTED MATERIAL (A.9)

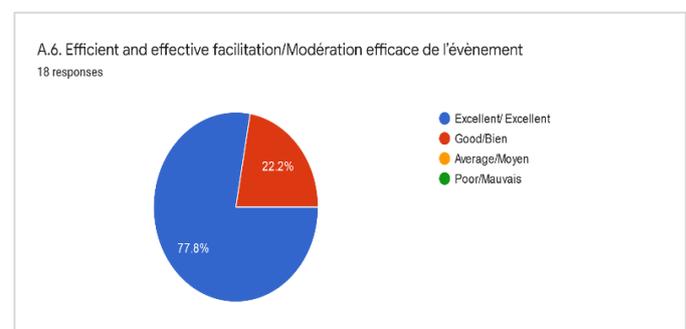


FIGURE 8-6: EFFICIENCY AND EFFECTIVENESS OF THE FACILITATION (A.10)

B. Feedback by participants:



FIGURE 8-7: WORKSHOP COVERAGE

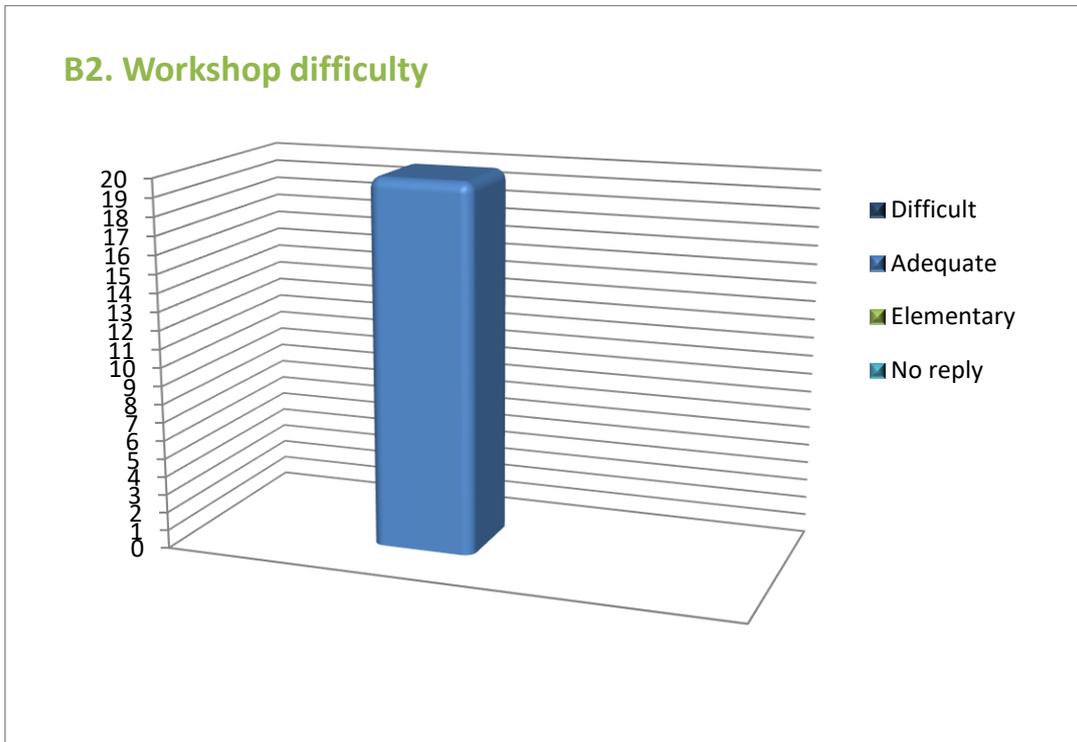


FIGURE 8-8: WORKSHOP DIFFICULTY

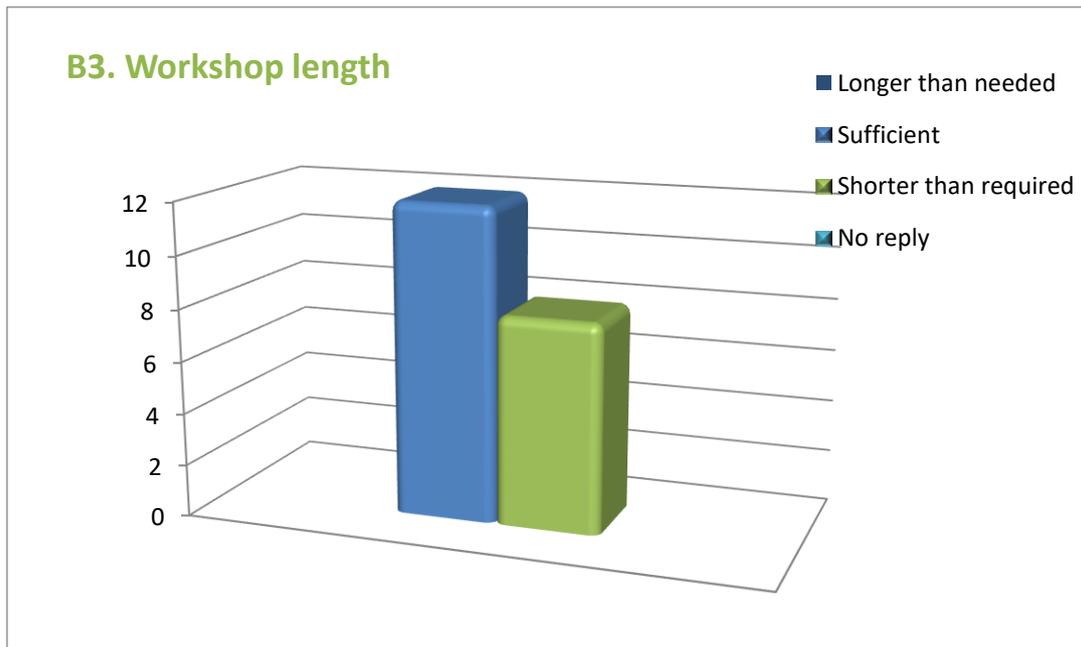


FIGURE 8-9: WORKSHOP LENGTH

Summary of most frequent statements made by the participants

B4	What is the most valuable thing you learned during the study tour & interactive workshop (knowledge or skills)?
	<ul style="list-style-type: none"> • It transformed my thinking about construction waste and I decided to make awareness to my Agency’s employees • Sorting. Treatment. Intensive from the public sector • Intensive from the government to private sector • The site visits • This is the first time that I can feel and see circular economy. Before it was a myth for me • Les techniques de gestion des déchets de DCD sont faciles à appliquer dans nos pays • We learned about a lot of materials that we can get from the treatment of CDW. And a lot of ways that we hope to apply in Palestine soon. • Visiting sites • New approaches to CDW recycling, mixing recycled materials into new products, how to create value for recycled materials • Aggregate from C&DW • I learned a lot through France experiences in the reuse of the demolition and construction waste • The use of ash in industry • That creating an economic value for recycled aggregates is a key for circular economy in recycled CDW

Summary of most frequent statements made by the participants

- Iron slag plant visit
- Knowledge
- Les DCD ont un grand potentiel de circularité | La filière des DCD demeure économiquement rentable une fois associée à d'autres activités industrielles
- Connaissance : C'est que la matière amiante peut être traitée et utilisée dans des chantiers spécialisées

B5

How do you think that the current event will assist you in your future work on the subject?

- It will be great to learn more about how to insert items or request from contractors to have efficient collection process from constructing new cities
- Building business model with TOR
- The technology. The incentive.
- Visiting the various recycling facilities was inspirational
- This event is the base of our future preparation for new CDW management. Specifically, economic tools and models, technical specifications and managerial procedures
- Les visites sur le terrain vont nous aider à expliquer et à sensibiliser les décideurs et les industriels à instaurer ce genre d'unité dans nos pays
- We will transfer all that we learn and see here to our institutions and we must work to make change in the ways we handle it now.
- Apply what I learned from new technologies from the practical visit in my field
- Very much - seeing facilities with my own eyes is priceless and talking directly with people on the ground in another country. I will be able to share all this and know what target and mechanism is feasible for Israel, and also compare practices.
- An excellent example
- By passing on what I learned in the workshop to officials in my organization and by seriously thinking about changing the handling pattern of construction and demolition waste
- By laying the foundations, legislation and future developments
- We are currently working with the Ministry of Environment to create a policy for CDW, so the information given is very valuable
- Transfer the knowledge to my home country
- L'événement nous a aidé d'identifier les acteurs potentiels à annoncer sur processus le développement sur cette filière pour pouvoir lever les défis liés à sa rentabilité économique, notamment les exploitants des carrières
- C'est très utile et nécessaire dans l'aménagement du site en phase de construction pour les déchets provenant de l'explosion du Port du Beirut



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"> • Inform our private sector and push them to collect construction waste effectively • Workshop for the relevant parties • Help the local industry move closer to implementing circular economy • Integrate knowledge acquired and integrate it into our new regulatory proposal • Transfer what I learned in the workshop to my co-workers through a presentation and by communicating with officials in my institution • En tant que municipalité de Beirut responsable du site déjà mentionnée en question B.5, c'est ma responsabilité de transférer toute mon expérience pour la réussite de ce projet
B7	<p>What did you like most about this event?</p> <ul style="list-style-type: none"> • I liked the process of asphalt reuse so much because it is good for our road maintenance • Everything • Variety of activities • Field visits, where we saw companies applying circular economy. Also the city. • Les visites sur le terrain • All the event is good. • Visiting the factories • Seeing innovative solutions like ecocem that are successful • Meet new people • Everything I liked but what I liked the most were the lectures and those responsible for the success of the workshop • Field visit to Matild facility • Visiting the recycling sites • La synergie entre les intervenants ou les acteurs industriels pour rendre la valorisation/ recyclage des DCD économiquement rentable. • La visite des chantiers pour voir sur place l'aménagement des déchets
B8	<p>What needs to be improved?</p> <ul style="list-style-type: none"> • I need more info about how to make a feasibility study for these projects • Really little. • It was perfect • Plus de temps pour bien visiter ces installations • Increasing number of the factories to visit • Not enough time for Q&A with the professionals we met. I was missing more in-depth info on the regulatory framework.

Summary of most frequent statements made by the participants

- Give more time for more study visit
- Everything was wonderful
- Work on the development of the separation process, and the installation of systems commensurate with the work of the facility
- It would have been better to know all the participants in the start, instead of spending two days before in the trip without knowing their names and occupations. Also, the new EPR law in CDW is quite innovative and it would have been nice to hear about it some more.
- More technical information in visit about the processing in paper form
- Time management
- Plus de temps, des résumés pour les sites et des photos pour avoir une idée précise pour qu'on puisse faire nos recherches techniques avant la visite surplace

C. Remarks by the trainer

A set of 9 criteria; B1-B9 (See table below) were assessed by the trainer(s).

B1	Efficient and effective performance and interaction by participants Very good interactions with participants and experts as well as with the persons met in the different visited sites. All participants (with few exceptions) were well aware of the topic and interested to learn and exchange
B2	Efficient and effective cooperation and team spirit Good (with always few exceptions)
B3	Level of achievement of planned objectives Good
B4	Did the event contribute to helping participants practice skills or gain knowledge related to course concepts According to the responses to the evaluation form, it seems that it can be answered "yes"
B5	What worked well during the event The exchanges and discussions during the site visits as well as the interactive discussion during the last day (workshop)
B6	What didn't work well and why Some logistical problems due to language misunderstanding
B7	What components/concepts did participants seem to understand well Site visits followed by a workshop to discuss the lessons learnt and recommendations are always a good "recipe"
B8	Were there any components/concepts that participants appeared to not understand The EPR system in the building sector nearly put in place in France seemed to be THE solution for a lot of participants but such a system requires a strong legal framework together with efficient governance and monitoring
B9	What aspects of the event could be improved and what to be kept Some participants could be better selected (meaning more adapted to the activity in terms of technical and decision-making competences).

9 CONCLUSIONS

The three intense days of visits, presentations and discussions were fruitful in sharing already established practices in Europe, in exchanging on recurrent challenges and possible replicability of solutions in the WES PCs.

The economic aspects of making the sector environmentally sustainable were at the core of the discussions. Along this line, main lessons learnt that can function as conclusions are as follows:

- The most important thing is to have a legal framework on how to manage this type of waste and to have a good business model with incentives.
- Private-public partnership is a must.
- CDW management, if managed in an industrial symbiosis perspective, laid down by a good legal framework, can be economically profitable.
- Sorting is the first step to be done as it allows to quickly, economically profitably get a better quality of inert waste.
- In order to make profit out of CDW management, it is useful to have an infrastructure able to sort inert waste (IW) (rubble, concrete, ceramics, cement or lime coatings, marble, bricks, excavated unpolluted soil, glass, etc.), non-inert non-hazardous waste (NINHW) (metals, paper, cardboard, plastic, untreated wood, gypsum plaster, insulation products, etc.) and hazardous waste (HW) (asbestos, paints, silicone, solvents, asphalt, bitumen, treated wood, aerosols, etc.), without forgetting their separation from household waste. The recycling of the first two types (IW) and (NINHW) have a higher economic value.
- Quarry extraction activity with CDW management is a good combination of activities. Quarry owners have a lot of empty space and can use part of the recycled material to produce new products (aggregates or concrete).
- Certification is key in order to gain the trust of end users of recycled products. Ideally, having an R&D lab on site, helps getting the best product (with the best properties).
- Instead of authorities multiplying obligations and fines, it would be more efficient to support business models as mentioned above.

10 ANNEXES

10.1 AGENDA

Day 1: 19 th of September		
Traveling day; arrival of the participants and experts; accommodation in Marseille at HOTEL IBIS MARSEILLE CENTRE EUROMED		
Day 2: 20 th of September		
Time	Description	Location
08:15	Gathering in the Hotel's lobby	Marseille
08:30	Departure from Hotel	Marseille
09:30 – 10:30	Visit the Recycling Center & Crushing Platform: MAT'ILD Company (including transfer to the next location)	Bouc-Bel-Air
10:30 – 12:30	Sorting Center for CDW and Sorting Platform for Metals, Wood Shredding, and Carboards: Bales MAT'ILD Company (including transfer to the restaurant for lunch)	Gardanne
12:30 – 14:30	Lunch break	Meyreuil
14:30 – 16:00	Platform for Sorting and Recycling of Inert Waste: DURANCE GRANULATS Company	Gardanne
16:00 – 17:00	Return to Hotel	Marseille
17:00	End of the working day	Marseille
Day 3: 21 st of September		
Time	Description	Location
08:30	Departure from Marseille	Marseille
09:30 – 11:30	Incineration Bottom Ash Treatment Platform: MAT'ILD Company (including transfer to the restaurant for lunch)	Fosse-sur-Mer
11:30 – 13:00	Lunch break	Fosse-sur-Mer
13:00 – 15:00	ArcelorMittal, ECOCEM Company	Fosse-sur-Mer
15:00 – 17:00	Exchange with the Région Sud – Provence-Alpes-Côte d'Azur Q&A, potential partnership and follow-up actions	Marseille
17:00	End of the working day	Marseille

Day 4: 22nd of September

Interactive Workshop on management of Construction and Demolition Waste

(Venue: EMD Business School, Rue Joseph Biaggi, 13003 Marseille)

Timing	Description
09:00 – 09:15	Welcoming words, a few words about WES and practical info (<i>Anis Ismail WES key environment expert</i>)
09:15 – 09:45	CDW management in the EU – legal and economic context and state of art in link with the facilities visited the days before (<i>Françoise Bonnet, WES expert - ACR+</i>) Q&A session
09:45 – 10:15	ENI CBC-Med RE-MED Project – introduction, outputs (<i>Oumaya Marzouk, RE-MED project - CEREMA</i>)
10:15 – 10:45	Solutions for better collection and management of CDW – results of PhD thesis (<i>Boushra Barakat, AUB, Lebanon and Bassam Sabbagh WES Focal Point, MoE, Lebanon</i>)
10:45 – 11:15	Q&A Session
11:15 – 11:30	Coffee break
11:30 – 12:00	CDW management practices in the Southern Mediterranean – special insight into the case of Tunisia (<i>Ahmed Jelidi, WES expert – ENIT, Tunisia</i>)
12:00 – 12:30	Q&A Session
12:30 – 14:00	Lunch break
14:00 – 15:00	Wrap-up of the 3 days (sorting – collection – recycling of CDW): minimum requirements and lessons learnt
15:00 – 15:30	Presentation of outcomes of the wrap-up session Conclusions, lessons learnt and recommendations from the Study Tour and the Workshop
15:30 – 16:00	Desk Study on CDW: structure, content, expected contribution from the Peers
16:00-16:30	Awarding of Certificates to participants Filling out the evaluation of the Study Visit and Workshop Closing remarks
16:30	End of the working day - Possible departure of some participants

Day 5: 23rd of September

Traveling day, departure of the participants

10.2 ACTIVITY MATERIALS

All of the materials including presentations, photos, press release, etc. are available at:

https://www.wes-med.eu/activities_type/re-4-reg-st-management-of-construction-demolition-waste-cdw/

