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Water and Environment Support
in the ENI Southern Neighbourhood region

Activity No: RE-2-REG

Regional activity (3 webinars in May-June 2022) on

Understanding better microplastics and identifying how to address the issue

FINAL REPORT

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v.1	*Regional activity (3 webinars in May-June 2022) on Understanding better microplastics and identifying how to address the issue- Activity No: RE-2-REG- Final Report*	*Marta Junquera* *Pedro Fernández*	*Anis Ismail* *Michael Scoullos*

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 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 the capacity of 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.

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ABBREVIATIONS

EC	European Commission
ESD	Education for Sustainable Development
ECHA	European Chemicals Agency
UN	United Nations
UfM	Union for the Mediterranean
UNEP MAP	UN Environment Programme Mediterranean Action Plan
UNEA	UN Environmental Assembly
SAPEA	Science Advice for Policy by European Academies
SCP	Sustainable Consumption and Production
SDGs	Sustainable Development Goals
NGOs	Non Governmental Oragnisations

2 GENERAL INTRODUCTION

It is widely acknowledged that the Mediterranean Sea is one of the most affected seas by marine litter worldwide. Although there is uncertainty in the estimation, an annual plastic leakage of 229,000 tonnes, made up of 94% macroplastics and 6% microplastics is accounted for[1]. The root causes of marine plastic pollution are the same as anywhere else in the world: a complex combination of unsustainable production and consumption patterns, including a wide spread throw-away culture, irresponsible behavior of individuals and economic sectors, poor solid waste management practices, weak enforcement and/or lack of policy and legislative frameworks, misconceptions related to possible solutions and/or lack of effective coercive measures.

Microplastics and nanoplastics (smaller than 1 µm) are ubiquitous in the Mediterranean. Microplastics are found to be present in every studied Mediterranean shoreline of 18 coastal countries. Cózar et al. (2015)[2] reported that the abundance of microplastics in the Mediterranean is similar to that found in the Pacific Ocean gyres, with a mean abundance of 0.83 microplastic particles/m^3.

Once in the sea, microplastics and nanoplastics can be ingested by marine biota; microplastics ingestion by wide-ranging marine species (fish, mollusks, etc.) has been extensively documented in the Mediterranean. Most microplastics and nanoplastics go in and out of most organisms, and as with many chemicals, 'the poison is in the dose'. It has been demonstrated in the laboratory that, at high exposure concentrations and under specific circumstances, microplastics can induce physical and chemical toxicity[3]. This can result in physical injuries, inducing inflammation and stress, or it can result in a blockage of the gastrointestinal tract and a subsequent reduced energy intake or respiration. Most of these effect studies, however, are performed using concentrations that are much higher than those currently reported in the environment, or using very small microplastics for which limited exposure data exists, or using spherical ones which are not representative of real-world types of particles, or using relatively short exposure times. Currently, it is not known to what extent these conditions apply to the natural environment. In addition to the potential harm caused by microplastics through ingestion, it has been suggested that microplastics might act as a vector facilitating the transport of chemicals to organisms upon ingestion. Some plastics contain potentially harmful chemicals/additives that could be released to organisms upon ingestion. Some of the leachates involved are known to be toxic, mutagenic, carcinogenic or hormone-disruptive and bio accumulative. Furthermore, plastics are known to adsorb persistent organic pollutants from water and in a matter of days, concentrations on the surface of the plastic can become orders of magnitude greater than in the surrounding water. If these adsorbed chemicals desorb upon ingestion they can provide a route for facilitating the transfer of chemicals to biota.

[1] IUCN (2020) The Mediterranean: Mare Plasticum, https://portals.iucn.org/library/node/49124

[2] *Cózar et al., 2015. Plastic accumulation in the Mediterranean Sea. PLoS One, 10 (2015), Article e0121762, 10.1371/journal.pone.0121762*

[3] SAPEA, Science Advice for Policy by European Academies, 2019. A Scientific Perspective on Microplastics in Nature and Society. Berlin: SAPEA. https://doi.org/10.26356/microplastics.

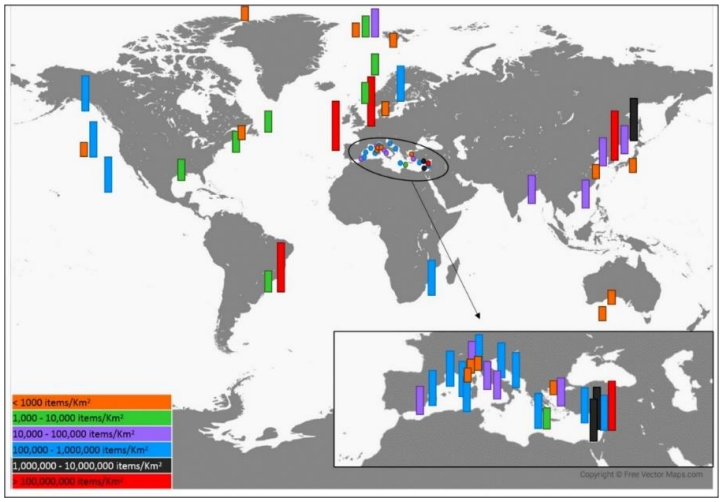


Fig. 1: Average number of microplastics floating in the Mediterranean Sea reported in the scientific literature, expressed in items per square kilometer

Llorca et al., 2020. Microplastics in Mediterranean coastal area: toxicity and impact for the environment and human health. Trends in Environmental Analytical Chemistry. 27. e00090. 10.1016/j.teac.2020.e00090.

Microplastics have become a severe environmental challenge: they are everywhere and there are no reliable estimates of their quantities entering the marine environment. In addition, uncertainties remain regarding the extent of harm caused to marine species by ingestion of microplastics and their exposure to hazardous chemicals leaching from or adsorbed on microplastics, while basic toxicological data on the consumption of microplastics and nanoplastics by humans for a food risk safety assessment are lacking.

2.1 RATIONALE OF ACTIVITY

At global level, the issue of marine (micro)plastics is directly addressed by the UN SDG 14, which states: "Conserve and sustainably use the oceans, seas and marine resources for sustainable development". Specifically, in target 14.1: "By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution". In order to strengthen efforts to eradicate marine plastic litter and microplastics, the UN Environment Assembly established in 2017 an Expert Group on Marine Litter and Microplastics to work on a global response to the issue.

At the EU level, a high-level scientific report was published in 2019 by SAPEA entitled "A Scientific Perspective on Microplastics in Nature and Society". SAPEA is part of the European Commission's Scientific Advice Mechanism and the report aimed at providing independent scientific advice to European Commissioners to support their decision-making. In fact, the SAPEA report informed the 2019 scientific opinion on 'Environmental and Health Risks of Microplastic Pollution' making recommendations to advise debate, policy and practice in this area. There is currently no single European law that covers microplastics in a comprehensive manner. As a first step, the European Commission requested the European Chemicals Agency (ECHA) to prepare a restriction dossier concerning the use of intentionally added microplastics to consumer or professional use products. The Commission will soon assess ECHA's submission and reflect on the most appropriate measures.

In parallel, in the European Green Deal and the new Circular Economy Action Plan, the EC committed to address the unintentional releases of microplastics in the environment by developing labelling, standardisation, certification and regulatory measures. Where reduction of the emissions at source is

not possible, measures to increase the capture of microplastics at all relevant stages of products' lifecycle are envisaged. The EC will also look at harmonising methods for measuring unintentional releases of microplastics (especially from tyres and textiles), and at closing the gaps on scientific knowledge related to the risks and occurrence of microplastics in the environment, drinking water and food.

This WES regional activity, comprised of three webinars delivered in 2022 that provided a comprehensive understanding of the problematic of microplastics, current initiatives, and delivered tools for policy makers to address the issue. It directly supported WES Partner Countries in tackling the issue, at regional and national level.

3 OBJECTIVES OF THE ACTIVITY

The overall aim of this regional training was to provide technical assistance and strengthen the capacities of the WES Partner Countries to effectively address the issue of microplastics in the Mediterranean marine environment.

The specific objectives of this activity are to:

- Improve the knowledge of participants on the threats that microplastics pose on the environment and human livelihood.
- Support the WES Partner Countries (competent national authorities and other stakeholders) in engaging further with regional plans to address the issue of microplastics.
- Enhance the capacity of the targeted stakeholders to monitor and assess primary and secondary microplastics.
- Facilitate the competent authorities of the WES Partner Countries to design and coordinate actions in preventing the use of primary microplastics, and to design and implement related national programs and policy measures.
- Develop the necessary competences of key non-state stakeholders of the WES Partner Countries to design and implement programs and actions to reduce and eventually phase out the use of primary microplastics and prevent the leakage of plastic litter into the environment.

4 EXPECTED RESULTS OF THE ACTIVITY

By participating in the training, the national authorities and stakeholders were expected to enhance their competences, in terms of:

- Technical aspects of microplastics (definitions, types, pathways, impact, etc.)
- Analysis of monitoring approaches, leakage of microplastics into the environment, knowledge gaps, etc.
- Identification of other issues related to microplastics, such as chemical pollution.
- Pros/cons of potential measures.
- Policy options to tackle the problematic of microplastics.
- Impact assessment of policy options.

- Policy and decision-making based on sound scientific evidence.

Similarly, the invited stakeholders that participated:

- Gained deeper knowledge on the problematic posed by microplastics, particularly related to their leakage into the coastal and marine environment.
- Obtained an understanding of the implications of microplastics in the environment.
- Got a clear understanding of the effects and impacts of primary and secondary microplastics.
- Learned about various measures to reduce and better manage leakage of microplastics.
- Gained knowledge on the current status of responses to manage the problematic od microplastics in the WES Partner Counties.
- Enhanced their capacity to assess the impact of various measures (private and public) opted to tackle the problem.
- Enhanced their capacity to implement policy measures to address microplastics, and monitor its presence.
- Reinforced a regional network of stakeholders dealing with marine plastic pollution in the Mediterranean.

All expected results were met to a satisfactory degree as the report shows in the following sections. **The three webinars were assessed by the trainees with an overall rating of 3,61 out of 4, showing a high level of satisfaction and expectations being met.**

5 ELEMENTS OF THE TRAINING'S IMPLEMENTATION

Three webinar sessions whose agendas and outcomes are indicated below were **held in the period from May to June 2022:**

5.1 CONTENT OF THE MODULES:

Module 1. Understanding the issue of microplastics in the marine environment: amounts, types, sources, effects and monitoring approaches. (12 May 2022, 11.00-13.15 CET)

The main idea for the first part of the regional online training was to introduce the challenges related to microplastics from the technical, environmental and health perspectives. More specifically, the Module introduced the basic terms and definitions related to microplastics, differentiating between primary and secondary microplastics. It provided key facts and figures related to their production and consumption, as well as their leakage into the environment and potential effects. An overview of the amounts, types, pathways, and sources in the Mediterranean, as well as monitoring techniques was provided.

Module 2. Political frameworks to address microplastics. Primary microplastics: pellet loss and intentionally added microplastics. (24 May 2022, 11.00-13.30 CET)

Primary microplastics are produced for commercial or manufacturing purposes; they are used for example as microbeads in cosmetics or personal care products, or as pellets to produce plastic products. Primary microplastics enter the environment directly through various channels—for example, product use (e.g., personal care products being washed into wastewater systems from households), unintentional loss from spills during manufacturing or transport. This second module dived into the specifics of primary microplastics, providing a detailed introduction on the topic, including effects and impacts. WES Partner Countries (public and private stakeholders), got acquainted with the current international and regional initiatives and frameworks to tackle the issue such as UNEA, the Barcelona Convention, the UfM's 2030 GreenerMed Agenda, and the EU. The training also provided an overview of specific measures implemented by public authorities, responses by the private sector and by Civil Society Organisations. The Beat the Microbead campaign, that runs since 2012 by more than 100 NGOs in 42 countries globally, was showcased as an example of good practice.

Module 3. Unintentionally released microplastics and secondary microplastics. (14th June 2022, 11h00-13h10 CET)

The third Module of the Regional Training took a closer look at the issue of unintentionally released microplastics and secondary microplastics which derive from the breakdown or fragmentation of larger plastics; or the ones derived from abrasion or erosion such as the ones generated from textiles or from tyres. The module followed a similar logic of the previous modules, introduced the concept of secondary microplastics and the two existing types, the sources, pathways and location, and also gave an overview of the current situation in addressing the issue both at international and regional levesl.

Regarding the **case studies and the key concepts** that were shared throughout the training with participants and that serve as additional training material for participants who wish to deepen their knowledge, a list of the most relevant ones and the links to the documents of reference are annexed to this report.

5.2 SOME FIGURES ABOUT THE TRAINING

No. of presentations on examples/case studies (sharing of experiences, good practices, etc.)	8
No. of international speakers from the Region	5
No. of international speakers from the EU	9
No. of training-oriented presentations (on concepts, methodologies, etc.)	10
No. of interactive/participatory activities (open discussions, brainstorming sessions)	5

6 PROFILE OF THE PARTICIPANTS

The main target group of this regional activity were policy makers. However, in order to increase impact, strengthen partnerships, and maximize synergies, it also addressed other stakeholders along the value chain (plastics system), from the plastics industry to the consumers, through civil society organizations.

The profile of the 52 participants that participated in the webinars is outlined as follows:

- policy persons from the Ministry of Environment (dealing with plastics regulation) (some of them had been Peers of the WES RE-1-P2P activiy on Single-use plastics (Peer-to-Peer process)
- policy persons from other public institutions dealing with plastic pollution monitoring (Ministry of Industry, waste agency, research centres, universities)
- persons from the productive sector (business organisations, relevant associations)
- CSO representatives (environmental NGOs, consumers' associations, women's groups, youth groups, ...)

Participants from the Western Balkans (Albania, Bosnia and Herzegovina, Montenegro) and Turkey were also invited.

Training Workshop Demographics

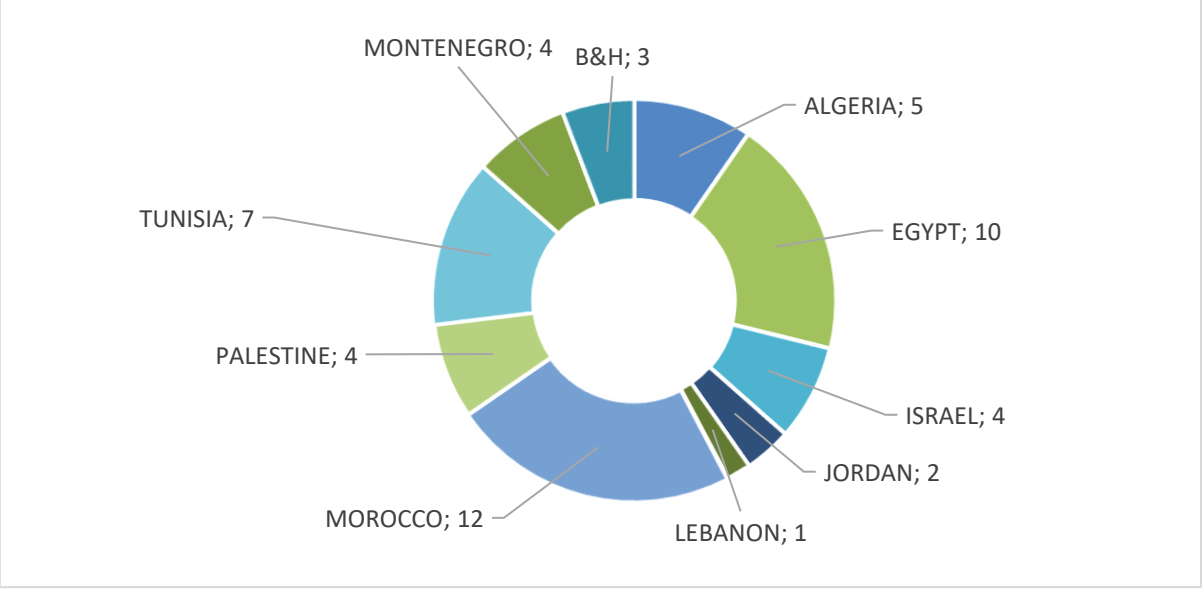


FIGURE 6-1: REPRESENTATION OF TRAINEES PER COUNTRY

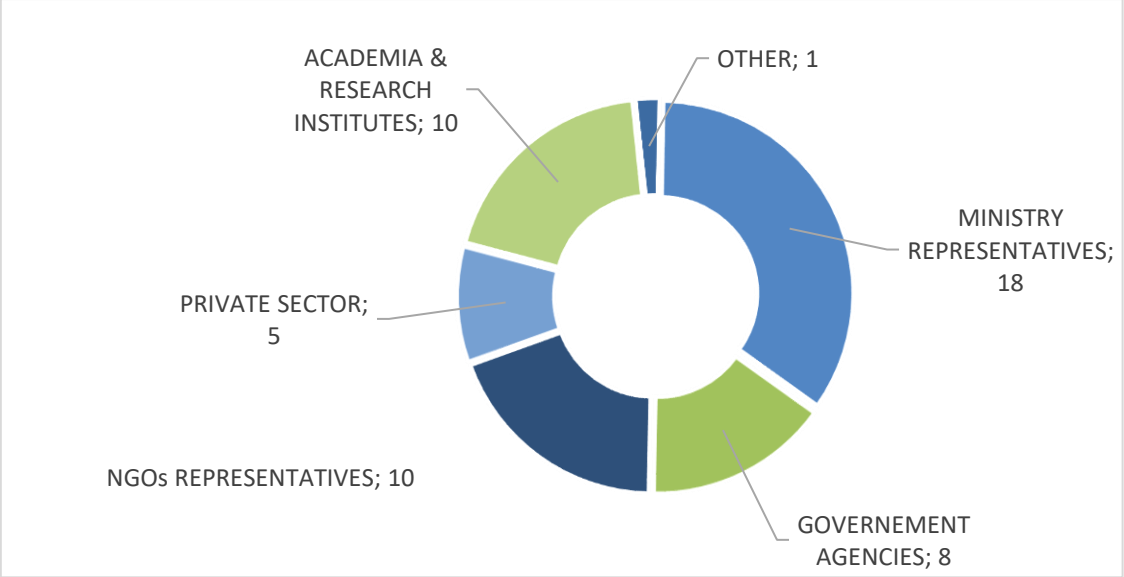


FIGURE 6-2: REPRESENTATION OF TRAINEES PER TYPE OF INSTITUTION

7 STATISTICS ON GENDER AND YOUTH

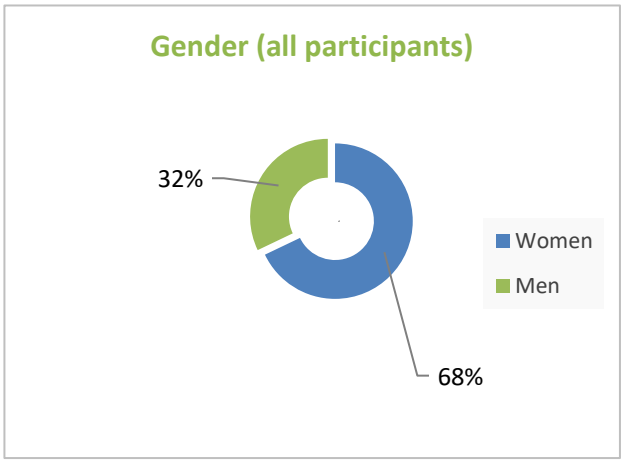


FIGURE 7-1: GENDER (ALL PARTICIPANTS)

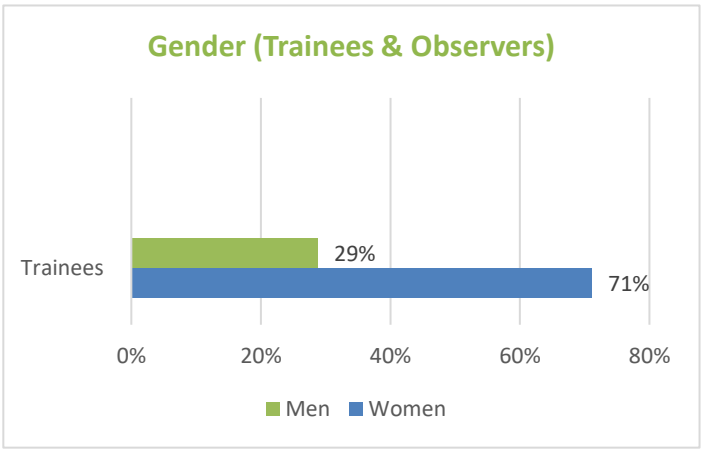
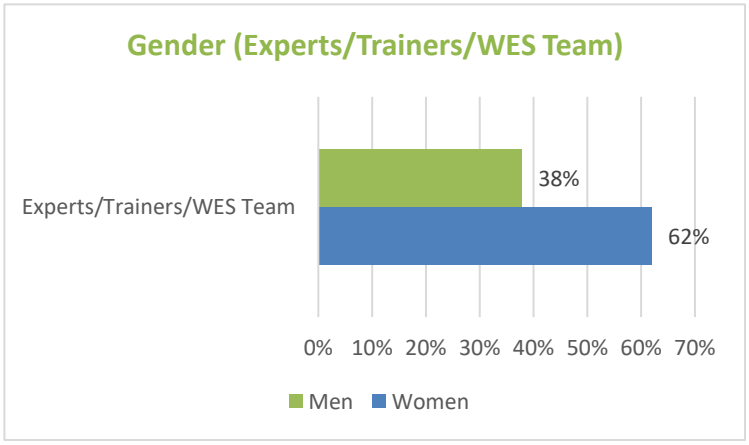


FIGURE 7-2: GENDER (TRAINEES AND OBSERVERS)



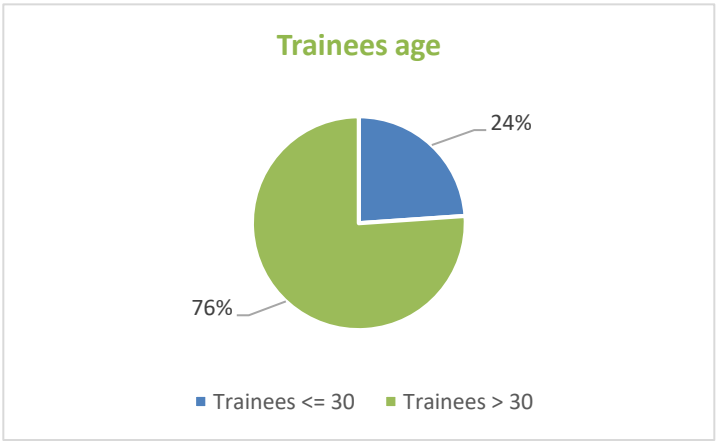
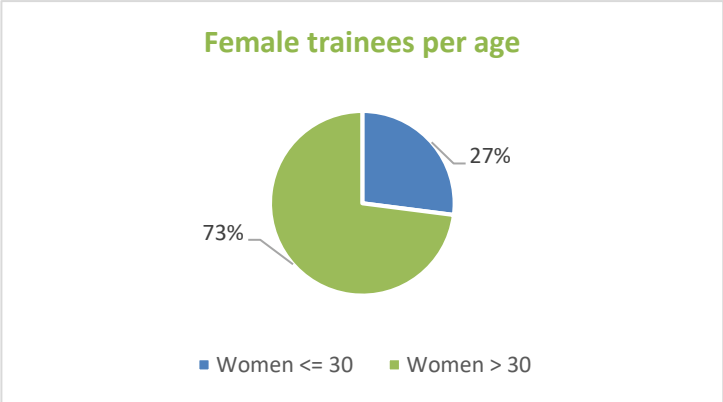


FIGURE 7-3: GENDER (EXPERTS/TRAINERS/WES TEAM)

FIGURE 7-4: TRAINEES - AGE



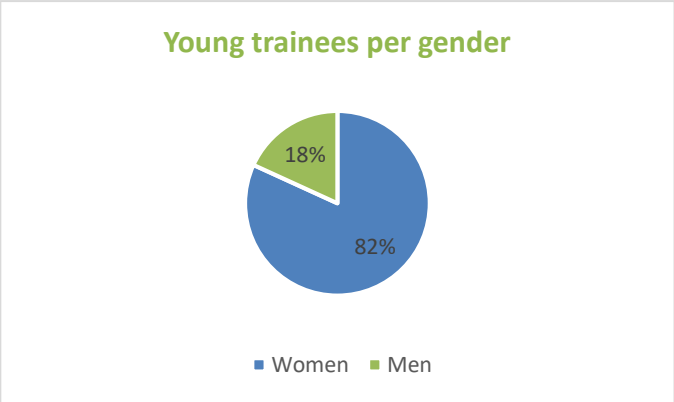


FIGURE 7-5: FEMALE TRAINEES - AGE

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

8. EVALUATION OF THE TRAINING

8.1 Organisational, administrative and planning issues before and during the event

A set of 11 criteria; A1-A11 (See table below) were assessed by a minimum of 20 participants who replied to the WES questionnaire, 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, information sharing and smoothing obstacles	14	9			23	3,61
A2	Efficient logistics: user-friendly online platform, interpretation quality, etc.	13	8			21	3,62
A3	Provision of support (if requested) for participants' preparation for the event	12	8			20	3,60
A4	Efficient and effective follow-up of preparations and progress towards the event	9	9	2		20	3,50
A5	Planning for the event: selection and design of methodology, programme/daily agenda and work rules	12	9	1		22	3,57
A6	Smooth flow of programme, efficient handling of emerging needs and attentiveness to participants concerns	14	9			23	3,61
A7	Presentations correspond and contribute to the planned objectives and are conducive to enhanced shared understanding and participation on addressed topics	12	10			22	3,55
A8	Clarity, coverage and sufficiency of concepts, objectives, anticipated outputs	11	10	1		22	3,52
A9	The support material shared was helpful	8	12	2		22	3,40
A10	Efficiency and effectiveness of the facilitation	11	12			23	3,48
A11	Overall rating of the event	14	9			23	**3,61**

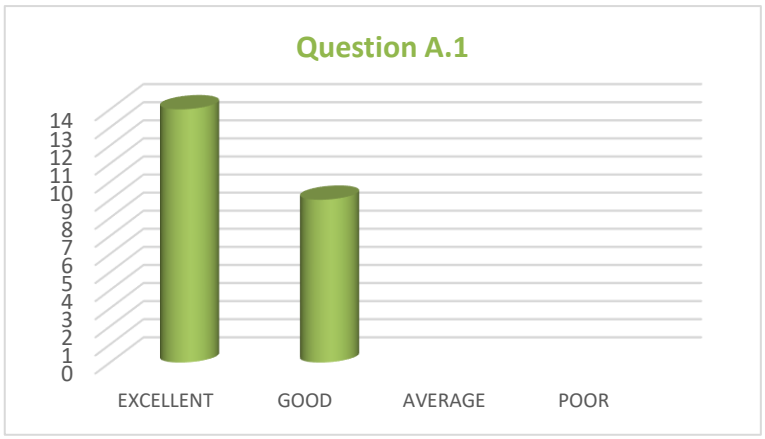


FIGURE 8-1-1: APPROPRIATE HANDLING OF INVITATIONS, INFORMATION SHARING AND SMOOTHING OBSTACLES (A.1)

FIGURE 8-1-2: EFFICIENT LOGISTICS: USER-FRIENDLY ONLINE PLATFORM, INTERPRETATION QUALITY, ETC. (A.2)

FIGURE 8-2-3: PROVISION OF SUPPORT (IF REQUESTED) FOR PARTICIPANTS' PREPARATION FOR THE EVENT (A.3)

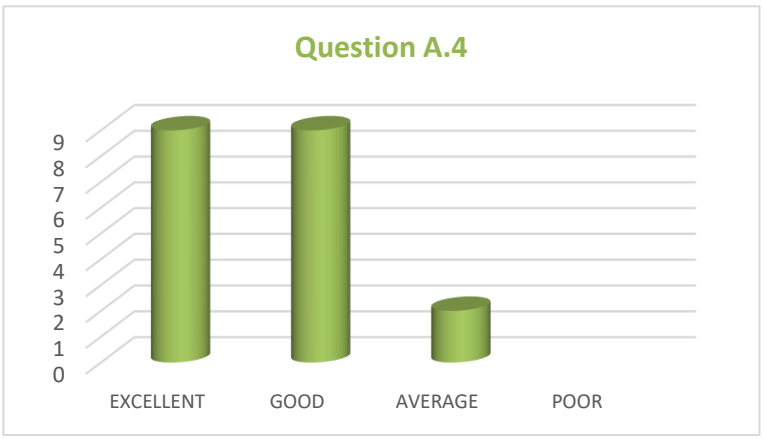


FIGURE 8-3-4: EFFICIENT AND EFFECTIVE FOLLOW-UP OF PREPARATIONS AND PROGRESS TOWARDS THE EVENT (A.4)

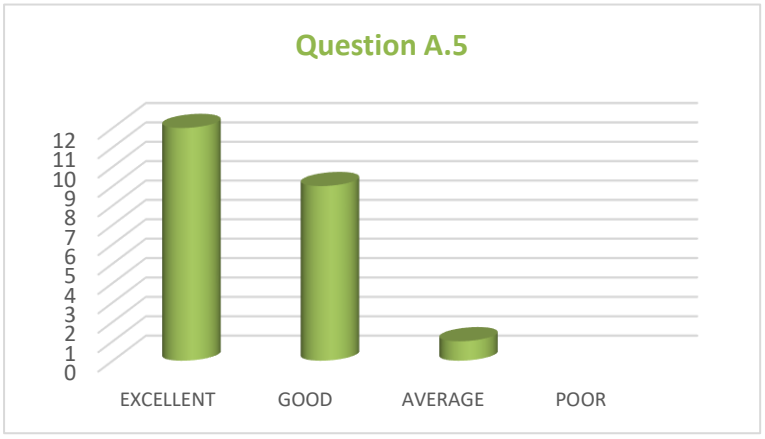


FIGURE 8-4-5: PLANNING FOR THE EVENT (A.5)

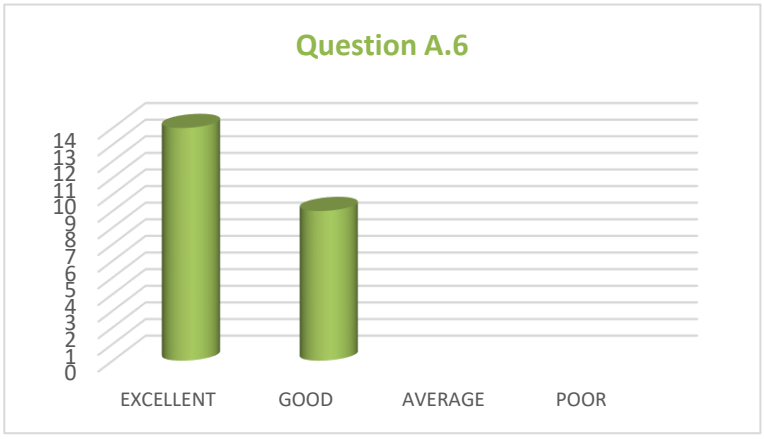


FIGURE 8-1-6: FLOW OF PROGRAMME, HANDLING OF EMERGING NEEDS (A.6)

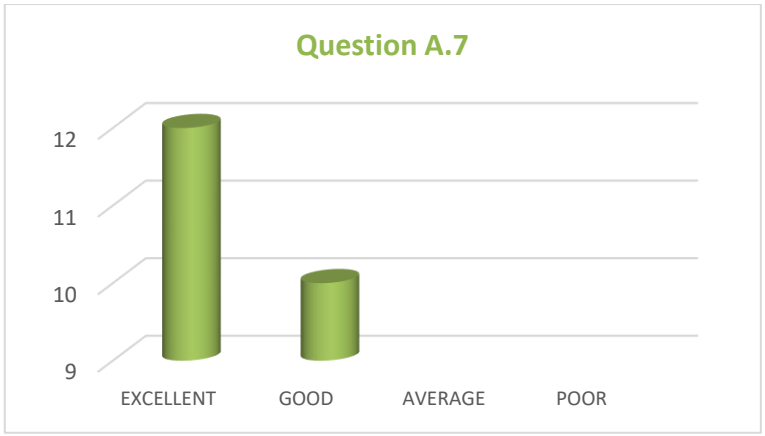


FIGURE 8-1-7: EVALUTION OF PRESENTATIONS (A.7)

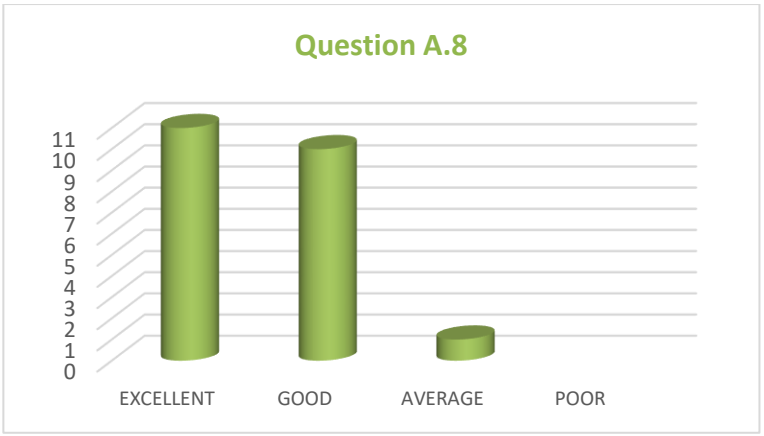


FIGURE 8-1-8: CLARITY, COVERAGE AND SUFFICIENCY OF CONCEPTS, OBJECTIVES, ANTICIPATED OUTPUTS (A.8)

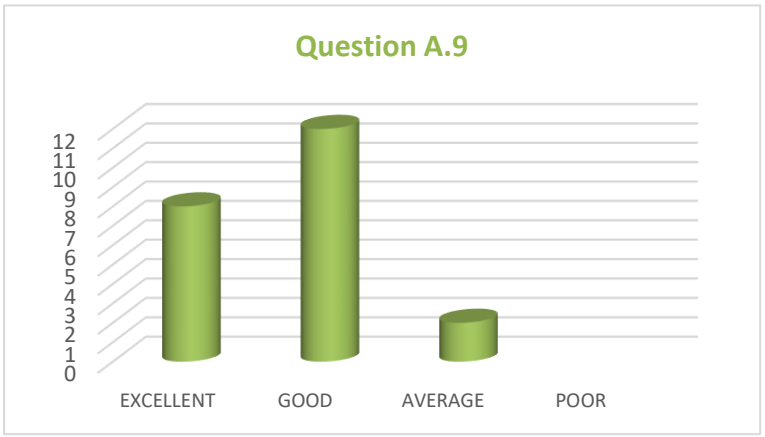


FIGURE 8-1-9: USEFULNESS OF THE DISTRIBUTED MATERIAL (A.9)

FIGURE 8-1-10: EFFICIENCY AND EFFECTIVENESS OF THE FACILITATION (A.10)

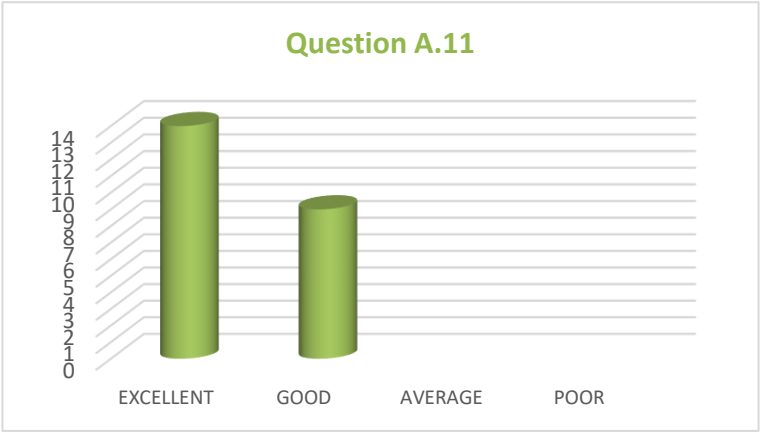


FIGURE 8-1-11: OVERALL RATING OF THE EVENT (A.11)

8.2 Feedback from participants

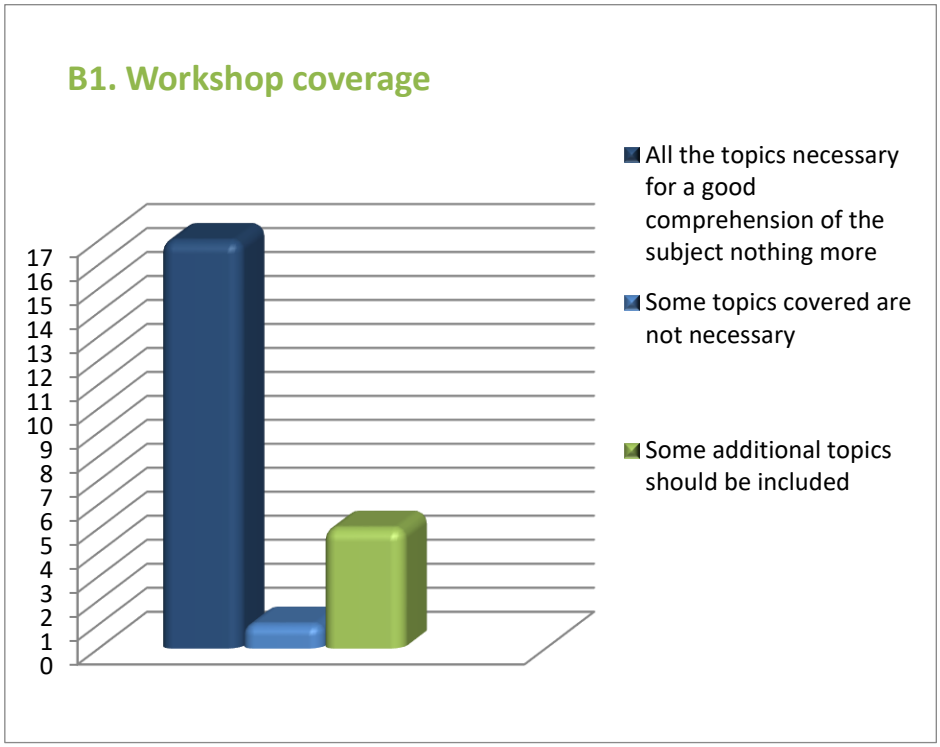


FIGURE 8-2-1: WORKSHOP COVERAGE (B.1)

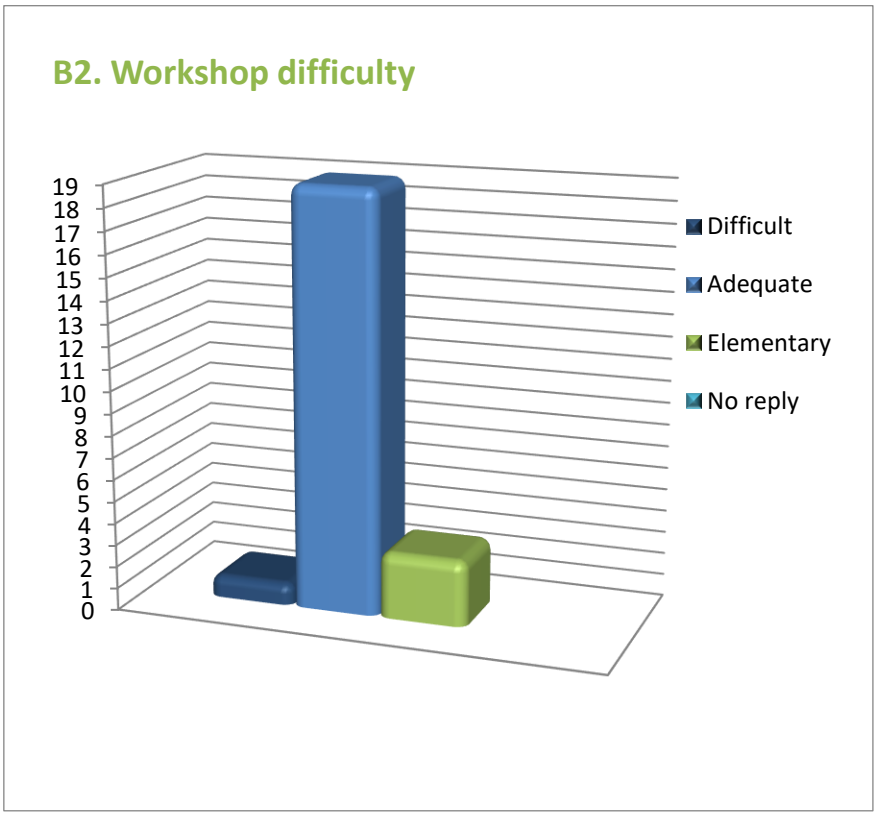


FIGURE 8-2-2: WORKSHOP DIFFICULTY (B.2)

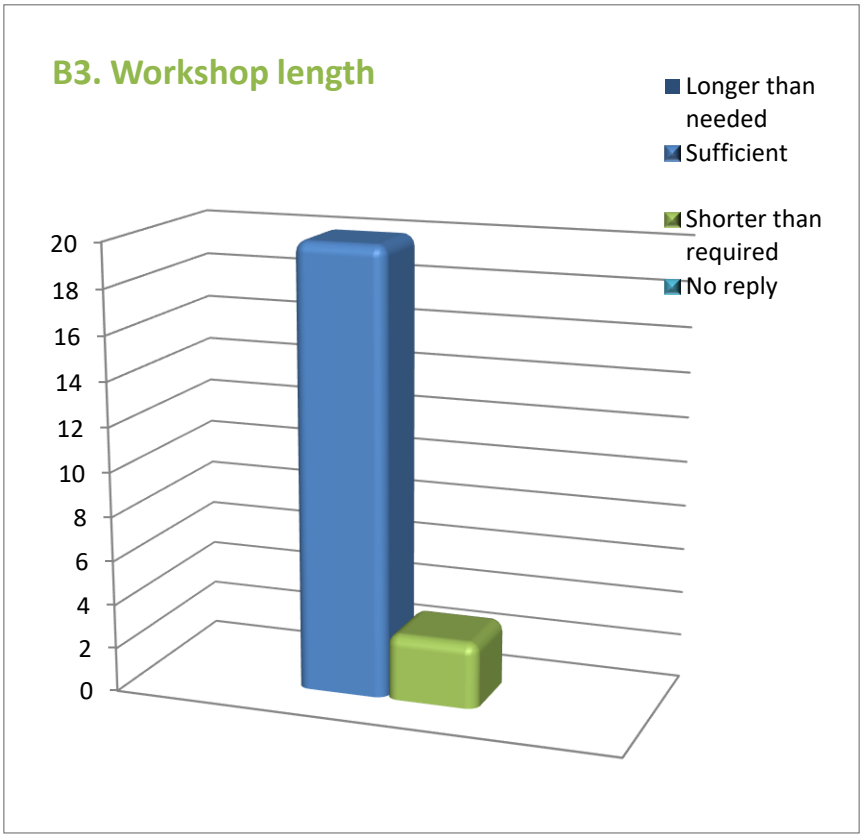


FIGURE 8-2-3: WORKSHOP LENGTH (B.3)

Qualitative assessment:

In the following table, the responses given by trainees to the open-text questions of the evaluation questionnaire are compiled. The key words or phrases of their replies are underlined.

Summary of most frequent statements made by the participants	
B4	**What is the most valuable thing you learned during the workshop (knowledge or skills)?**
	▪ I gained new insights and knowledge which can be handy for my work, especially in awareness raising (e.g., textiles and tyres as sources of microplastic, world statistics and more). ▪ The extent of microplastics in our clothes, our cosmetics, our tires...and the best ways to fight it. ▪ The growing threat of plastic pollution. ▪ I learned the meaning of microplastic concept, primary, secondary and the framework of the subject, and related subjects. ▪ The most valuable thing was the knowledge and the statistical data on microplastics, facts and figures.

Summary of most frequent statements made by the participants	
	▪ I learned a lot more about the microplastic issue in transport and textile sectors, which was very valuable ▪ What is the microplastics and how we keep the environment healthy? ▪ Quantitative measurements of micro-particles generated from tires. ▪ Renew knowledge and learn about extraction methods for microplastics. ▪ All basics related to microplastics and test methods and regulations related to this topic. ▪ The global proportion of microplastics and the actual danger to ecosystems make this an immediate emergency. ▪ Really, important knowledge about the sources and impacts of microplastic pollution. ▪ Microplastics and cosmetic products.
B5	**How do you think that the current event will assist you in your future work on the subject?**
	▪ Raising the awareness of the staff concerning this issue, applying actions to help reduce the impact of microplastic pollution, proposing alternatives in this field within the framework of scientific research (encouraging young researchers to better understand the problem of microplastic pollution) ▪ Getting more information about the microplastics and this will help me in the assessment of the concept notes and the project proposals related to the targeted subject; will present to the ministry of environment. ▪ I am going to disseminate the information to my superiors and see how we are going to proceed with the characterization of these microplastics in the first place. ▪ Food for thought for ideas of projects to be developed at a national level and effectively contribute to the international efforts on the subject (UNEA resolution). ▪ We will be getting back to the presentations for knowledge and facts, and to the presenters if needed for the information in our future work. ▪ To assist in a first assessment of microplastics on a section of the Atlantic and Mediterranean coastline. ▪ It can assist in developing a strategy to decrease microplastics and how to deal with single-use plastics. ▪ Awareness in the field of the plastics industry. ▪ To have a clearer vision to be able to better explain the problem to my students ▪ Consider the use of new methods for plastic extraction. ▪ The main pathways to prevent releasing microplastics. ▪ Conservation of biodiversity and environment. ▪ I will implement it in my future work. ▪

Summary of most frequent statements made by the participants	
B6	**Please indicate whether (and how) you could transfer part of the experience gained from the event to your colleagues in your country?**
	▪ When making oral presentations at seminars and conferences concerned with environmental pollution and its side effects and the importance of preserving the environment I will raise awareness of the harm of using plastic and what microplastics can do and their effect on the environment and animals and work on replacing it ▪ Actually, I'm a PhD student and member of several associations and I can prepare a workshop for students. Also, I will share all the information on my twitter account which has 500 followers ▪ We may write a regional project in the future sharing knowledge about microplastics and communicate on the issue when discussing it with other NGOs and governmental institutions in the country. ▪ Yes, I will share the documents provided with my colleagues and will engage in discussions with them regarding ideas for future projects to tackle pollution by plastics and microplastics. ▪ Share with them the links of the modules acquired during the training. Propose workshops to transfer some experiences. ▪ Share the materials provided, use the new data I received to prepare outreach materials, media, articles, interviews, etc. ▪ I am the secretary of a plastic technical committee and I can transfer this experience to all stakeholders. ▪ Transfer of knowledge in our Faculty of Sciences of Sfax and our country Tunisia. ▪ This will be done for fellow teachers and researchers but also for the members of the NGO. ▪ I can eventually present the essence of this training to my colleagues and organize an information event at the university. ▪ Through projects and organizing meetings.
B7	**What did you like most about this event?**
	▪ The lecturers and the topic of the event were new to me. I did not think that microplastics had such serious effects. The event added knowledge and value to me. The organization and the way the information was presented was very impressive. ▪ It was very 'communicative' and I am happy that we are able to use all materials and presentations- they will be really handy! ▪ Excellent presenters and detailed explanations about microplastics, its use, and how other countries struggle against it. ▪ The information is accurate and all participants had no problem understanding the translation. ▪ Very specific, topic oriented, covering all aspects of the issue of microplastics. ▪ The organization and quality of the speakers and their teaching methods ▪ The space to ask questions and discuss.

Summary of most frequent statements made by the participants	
	▪ Interactivity and multitude of perspectives. ▪ I liked that the dates were not consecutive in time. ▪ The presentations and logistics issues were very good. ▪ The simplicity of the presentations. ▪ The wealth of information. ▪ The quality of the training. ▪ The exchange with the experts. ▪ Everything.
B8	**What needs to be improved?**
	▪ Nothing! ▪ There could have been more focus and assistance for following actions and assimilation strategy in each country, perhaps a hands-on/ brainstorming workshop and not just lectures. More case studies. ▪ It would have been better in my opinion if it was a face-to-face event for 3 consecutive days for a better focus and better follow up of the training ▪ Include more information of results on types of microplastics found in biota and also more suggestions on the best methodologies for extraction. ▪ A study visit to plastic production and plastic recycling plants. ▪ More participants' involvement, interactive approach (only seen in module one) ▪ Provide more case studies and visits to success stories. ▪ Give more proven effective solutions. ▪ Extend the duration of the training. ▪ Interpretation or delivery in native language. ▪ Live workshops.

8.3 Remarks by the trainers

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

B1	**Efficient and effective performance and interaction by participants** Good
B2	**Efficient and effective cooperation and team spirit** Excellent
B3	**Level of achievement of planned objectives** Excellent
B4	**Did the event contribute to helping participants practice skills or gain knowledge related to course concepts?** Excellent
B5	**What worked well during the event** Generally, the training went according to the trainers' plan and goals. There was a high ratio of trainees that engaged during the sessions and discussions.
B6	**What didn't work well and why** – A rotation in the attendance: Some trainees couldn't participate in all three webinars. – Several declared as a "weak" point of the training not having the possibility for more participant's interactions and lacking a working session. – The distance from one webinar to the next (several weeks apart), that could have caused a lowering of the "trainings' memory" and a lowering of the momentum. Besides there was a slight drop also in the number of trainees form one webinar to the next.
B7	**What components/concepts did participants seem to understand well** The majority declared they have obtained a good understanding of the concept of microplastics, types, sources, and research techniques. In addition, the majority stated they have an increased knowledge and awareness of the big threat that plastic pollution especially microplastics have on the environment and human health.
B8	**Were there any components/concepts that participants appeared to not understand** In each webinar there was time for Q&A to clarify concepts, if needed. Trainees could also send emails to the trainers for clarifications. No apparent misconceptions were detected, but maybe some technical concepts need to be reviewed as there was important data to process when talking about numbers, percentages, compositions of plastics.
B9	**What aspects of the event could be improved and what should be kept** **Aspects to keep**: – The modality and the calendar chosen was appropriate and worked well: 2 or 3 webinars of a 2 to 3-hour duration every two weeks instead of having a single full day online event. – The composition of the trainees and the distribution among Mediterranean countries. – The combination of short theoretical interventions with interactive exercises (polls, etc.) and the diversity and quality of the presenters. There were presenters from a wide range of institutions, from independent

experts, experts working in the field, experts from national ministries and experts from non-governmental organisations.

- The design of the e-course from the beginning as a "virtual learning experience" and not as an online "transfer" of a face-to-face training session.

Aspects to improve:

- Increase the time allocated to interactive sessions (group work) in each webinar.
- Translation to FRENCH.
- Include more case studies and specific lessons to South Mediterranean countries.

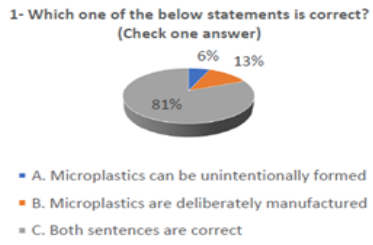
9 TRAINING QUESTIONNAIRES AND QUIZZES

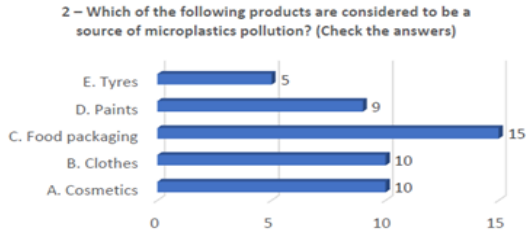
The participants took part in an initial **pre-webinar questionnaire** that allowed the trainers to identify the level of knowledge and knowledge gaps of the participants:

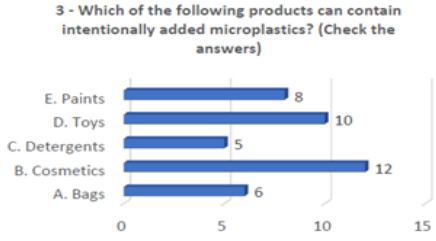
"Regional Training: Understanding better microplastics and identifying how to address the issue. Short pre-training questionnaire":

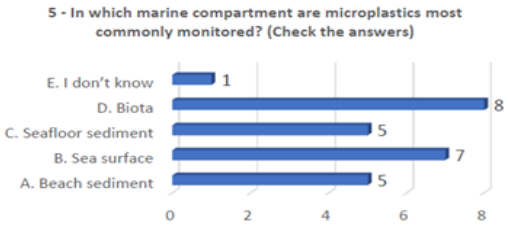
https://docs.google.com/forms/d/1769djCyYc_g3EJjGN9dajYwqcPKG_LJc03ROwDYL_iA/edit

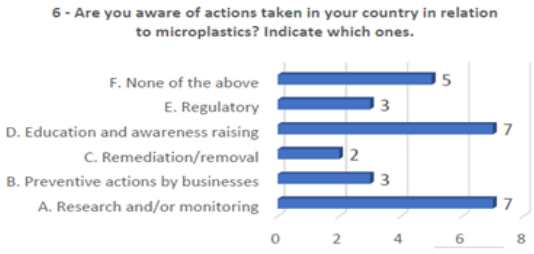
SURVEY RESULTS







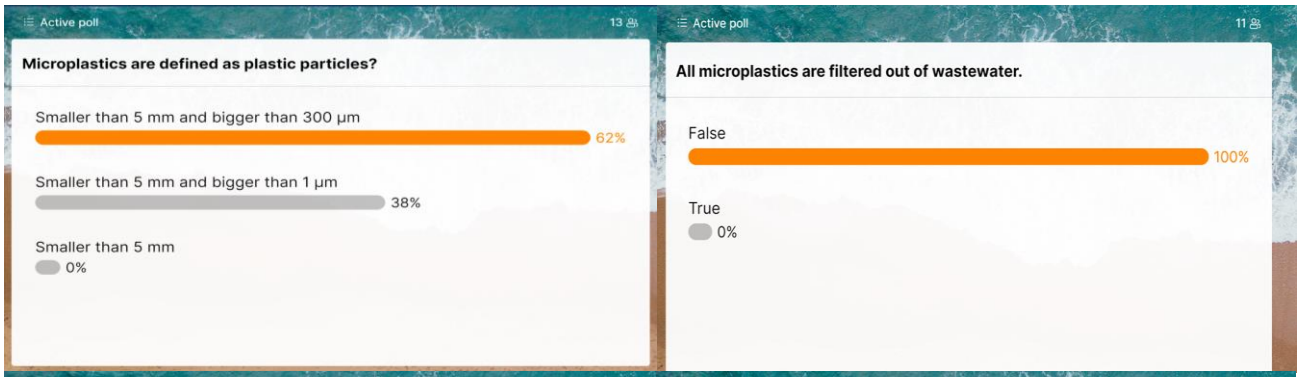


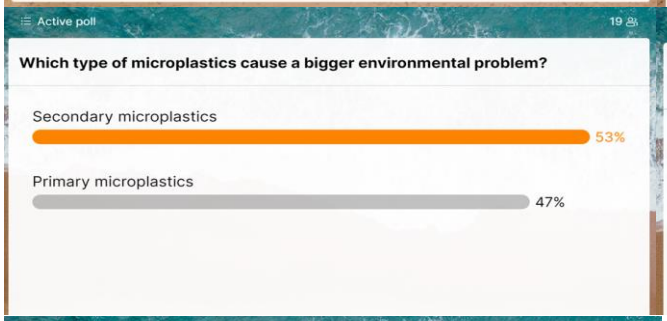


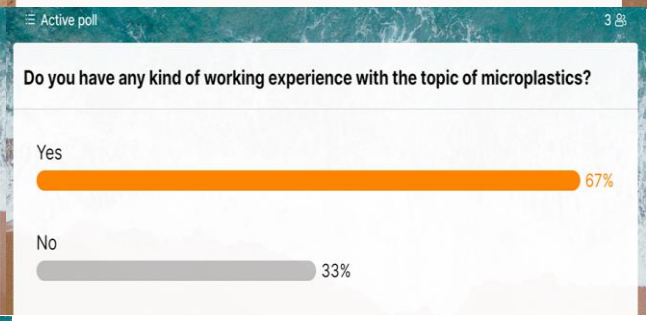
As a follow up, some of the questions from the pre-webinar questionnaire were asked to the participants and explained during the modules.

Throughout the three modules participants were able to participate in interactive **Quizzes and Q&A sessions** as follows:

Module 1: quiz, questions and Q&A. The results of the exercise can be found below:







For **Module 2 and Module 3:** there were 2 moments for interaction with trainees, questions and discussions. There were interventions from trainees in most of these available timeslots, especially during webinar 3 were the questions of the trainees generated very good discussions and information sharing even between the experts. Just to name a few: support was requested for monitoring projects in Morocco, a question on fines to pellet loss as well as interest of NGOs to join some of the initiatives presented were some of the subjects and interventions that took place.

9. CONCLUSIONS & OVERALL ASSESSMENT

The proposal of this regional training originated from a request emanating from the Barcelona Convention where Focal Points expressed their wish to understand better the emerging issue of microplastics, their state of knowledge and which kind of action should be shaped by them to address this fast growing environmental and health concern. At the same time, the training supported the implementation of the UfM's 2030GreenerMed Agenda and its emphasis on plastics and microplastics.

This report shows that 10 Mediterranean countries participated in the training and that about half of the participants came from ministries or government agencies. So, it is safe to say that the targeted group of stakeholders was successfully met and their capacity to address the topic of microplastics has been enhanced.

The structure and the content of the modules of this training was of high quality; it provided a thorough yet comprehensive presentation and discussion on all aspects related to the issue of microplastics. The experts and invited speakers were not only very knowledgeable on the topics but represented the different sectors and actors in the field. Some of them currently lead ongoing studies, research, monitoring programs, develop policy guidance, and manage projects on the topics they presented. The diversity of the experts and participants allowed for varying insights, interventions and points of view to be voiced (from the private sector, NGOs, policy makers, researchers and academics). This made possible the delivery of an excellent training that managed to comprehensively cover this complex topic. The closing session and evaluation results (3,61/4) confirm this.

What was considered missing were working group sessions or sessions dedicated to support them within their specific context in developing national strategies or brainstorming on applicable measures. Case studies and practical actions more relevant to the WES PCs were also considered missing (although perhaps not so available). In addition, the preference of a face-to-face meeting (which most likely would have allowed the accommodation/inclusion of the above) was also strongly voiced. Nevertheless, even these weaknesses prove the high relevance of the training and also the need for a future training to go deeper into these aspects/requests.

In terms of the WES strategy on gender and youth, these were well met, with 62% of the trainees being women and 24% young men and women (among which 82% women).

There is an imperative need for policy makers in the Mediterranean region to tackle microplastics in their respective countries by implementing existing regional guidelines and action plans and by putting in place appropriate legal frameworks or enhancing accordingly existing ones. This regional WES training contributed to this end..

10. ANNEXES

10.1 AGENDA

Module 1: Understanding the issue of microplastics in the marine environment: amounts, types, sources, effects and monitoring approaches

12 May 2022, 11.00-13.15 CET /Brussels time (12.00-14.15 Amman time)

Timing (min)	Topic	Speaker	Description
2	Introduction to the technical settings and rules	WES team	Technical guidance/Etiquette
8	Opening	Prof. Michael Scoullos WES Team Leader	Opening, welcome remarks, a few words about WES and the training
5	Overview of the webinar/module 1	Th. Vlachogianni WES NKE (MIO-ECSDE)	Overview of the webinar/module 1, quick presentation of the speakers, slido question about how familiar participants are with the topics addressed by the module
10	Introduction to marine plastic pollution, definitions and characterization	Th. Vlachogianni WES NKE (MIO-ECSDE)	Set the scene and familiarize all participants with the problem of marine plastic pollution and key terms and definitions, slido questions about key definitions
15	Amounts, types, sources and effects of plastics and microplastics in the Mediterranean marine environment	Th. Vlachogianni WES NKE (MIO-ECSDE)	Provide some facts and figures about plastics and microplastics in the Mediterranean marine environment; provide an overview of the potential effects.

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15	Overview of microplastics monitoring approaches & knowledge gaps and research needs	Th. Vlachogianni WES NKE (MIO-ECSDE)	Quick overview on the different types of microplastics monitoring approaches. Depict the main uncertainties and knowledge gaps on the issue of microplastics and outline the areas where more research is needed.
15	Plastics and microplastics as vectors of chemical pollutants	C. Fossi UNISI	Provide a thorough analysis on plastics and microplastics as vectors of chemical pollutants.
15	Monitoring microplastics in biota	C. Fossi UNISI	Overview of tested protocols on monitoring microplastics in biota.
15	Monitoring microplastics in the marine environment	H. Kaberi HCMR	Overview of tested protocols on monitoring microplastics in the marine environment.
15	Overview of policy advances to tackle microplastics INT/REG	C. Ioakeimidis UNEP/MAP	Overview of policy advances to tackle microplastics mainly at UN-UNEA-UNEP levels but also at EU level.
15	Questions, final remarks & wrap up	Th. Vlachogianni WES NKE (MIO-ECSDE)	Participants may address the speakers with any final questions

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Module 2: Political frameworks to address microplastics. Primary microplastics: pellet loss and intentionally added microplastics.

24 May 2022, 11.00-13.30 CET (12.00-14.15 Amman time)

Timing (min)	Topic	Speaker	Description
2	Introduction to the technical settings and rules	WES team	Technical guidance/Etiquette
5	Recap from webinar 1 and overview of webinar 2	P. Fernández WES NKE (MedWaves)	Summary of main messages from webinar 1 and introduction to the agenda and content of webinar 2
15	Political frameworks addressing microplastics: focus on Barcelona Convention and EU Q&A	P. Fernández WES NKE (MedWaves)	Responses to microplastics by public authorities, focusing on the update of the Regional Plan of Marine Litter Management and different initiatives at the EU.
15	Introduction to Pellets loss: State of the art and potential measures	Chris Sherrington MedWaves External expert	Provide some facts and figures about pellet loss, measures and potential impacts
15	A regulatory supply-chain approach to pellet pollution and documented pellet loss events	Lucie Padovani Surfrider Foundation Europe	Explanation of five case studies of pellet loss in European seas
15	Operation Clean Sweep	Hervé Millet Plastics Europe	Explanation of the Operation Clean Sweep program to avoid pellet loss across the plastic value chain
10	Part 1 discussion		

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10 min	**BREAK**		
10	Intro to "intentionally added" microplastics, focus on personal care products: State of the art and potential measures	P. Fernández WES NKE (MedWaves)	Provide some facts and figures about "intentionally added" microplastics, focusing on personal care products, measures and potential impacts
15	Responses from civil society organization: the case of Beat the Microbead	Jeroen Dagevos Plastic Soup Foundation	Explanation of the Beat the microbead campaign by run by environmental associations at global level
15	Position from the cosmetic industry: the case of the Spanish association on perfumes and cosmetics	Raquel Santos Spanish National Association of Perfumery and Cosmetics	Explanation of the position of the perfumery and cosmetics industry in relation to REACH restriction proposal on personal care products
15	Questions, final remarks & wrap up	P. Fernández WES NKE (MedWaves)	Participants may address the speakers with any final questions

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Module 3: Unintentionally released microplastics and secondary microplastics.

14th June 2022, 11h00-13h10 CET (12h00-14h10 Amman time)

Timing (min)	Topic	Speaker	Description
10	Introduction to module 3: the challenge of microplastics and the ongoing global and regional initiatives	Magali Outters Team leader (MedWaves)	Introduction to the module by explaining the latest developments in the regional and global framework, particularly the upcoming legally binding global agreement.
5	Recap from webinar 2 and overview of webinar 3	Pedro Fernández WES NKE (MedWaves)	Summary of the main messages from webinar 2 and introduction to the agenda and content of webinar 3.
15	Measures on secondary microplastics	Pedro Fernández WES NKE (MedWaves)	Review of relevant policy measures and actions by Mediterranean countries to tackle the sources of secondary microplastics, and particularly single-use plastic products.
20	The role of national authorities in addressing microplastics: the case of Spain	Marta Martínez-Gil Spanish Ministry for the ecological transition and the demographic challenge	Overview of the actions taken in Spain in relation to microplastics, including monitoring programs and prevention actions.
20	Unintentionally released primary microplastics: state of the art and focus on tyre wear	Lucy Eggleston MedWaves External expert	Explanation on the different sources of release and estimation of amounts into the environment, potential measures and their potential effects. Focus will be on tyre wear as one of the main sources.
20	Microplastic pollution from textile consumption in Europe	Lars Mortensen European Environment Agency	Presentation of the study and report on Microplastic pollution from textile consumption in Europe, including the estimation of release and pathways to prevent or mitigate microplastics from textiles.
20	Q&A and discussion	Moderated by P. Fernández	Participants can ask any questions or doubts to the speakers
10 min	**Evaluation**		
10	Wrap up and closing	Anis Ismail WES Environmental Expert	

10.2 POWER POINT PRESENTATIONS AND VIDEOS

The presentations and the videos of these 3 webinars can be downloaded from the project web page:

https://www.wes-med.eu/activities_type/re-2-reg-understanding-better-microplastics-and-identifying-how-to-address-the-issue/

10.3 LINKS TO THE MOST RELEVANT DOCUMENTS OF REFERENCE:

- **Microplastics: Finding a consensus on the definition:**

  https://www.sciencedirect.com/science/article/abs/pii/S0025326X18307999?via%3Dihub
- **EU Marine Strategy Framework Directive Plastics Strategy Single Use Plastics Directive**

  https://www.europarc.org/wp-content/uploads/2018/01/Eu-plastics-strategy-brochure.pdf

  https://www.tandfonline.com/doi/abs/10.1080/02646811.2011.11435256?cookieSet=1
- **Barcelona Convention Ecosystem Approach Regional Plan for Marine Litter Management in the Mediterranean**

  https://wedocs.unep.org/bitstream/handle/20.500.11822/7097/mssd_2016_2025_eng.pdf
- **Understanding the socio-economic implications of marine litter in the Adriatic-ionian macroregion.**
  https://www.researchgate.net/publication/311085837_Understanding_the_socio-economic_implications_of_marine_litter_in_the_Adriatic-Ionian_macroregion
- **The art methods to monitor marine litter and its impacts on biodiversity. Interreg Med Plastic Busters MPAs project.**

  https://keep.eu/api/project-attachment/40243/get_file/
- **A scientific perspective on microplastics in nature and society. SAPEA**
- **Marine litter assessment in the mediterranean 2015, UNEP MAP**
- **Marine microplastics as vectors of major ocean pollutants and its hazards to the marine ecosystem and humans**.

  Tan suet May Amelia, Wan Mohd Afiq, Wan Mohd Khalik, Meng Chuan Ong, Yi Ta Shao, Hui-Juan Pan and Kesaven Bhubalan, 2021
- **Are Baleen whales exposed to the threat of microplastics? A case study of the mediterranean fin whale**.

  Maria Cristina Fossi, Cristina Panti, Cristiana Guerranti, Daniele Coppola, Matteo Giannetti, Letizia Marsili, Roberta Minutoli
- **Microplastics in fisheries and aquaculture - FAO**

  https://www.fao.org/3/I7677E/I7677E.pdf
- **Mare plasticum. The plastic sea**

https://indico.cern.ch/event/953495/attachments/2097868/3540096/The_How_and_Why.pdf

- **EEA**: https://www.eea.europa.eu/publications/microplastics-from-textiles-towards-a
- **Plastic giants polluting through the bacdoor: the case for a regulatory supply-chain approach to pellet pollution**.
  https://surfrider.eu/wp-content/uploads/2020/11/report-pellet-pollution-2020.pdf
- **Intentionally added microplastics in products. Final report for the European Commission ECHA, 2019.**
  https://echa.europa.eu/hot-topics/microplastics
- **UNEA5.2 resolution "End plastic pollution: Towards an international legally binding instrument**
  https://wedocs.unep.org/bitstream/handle/20.500.11822/38522/k2200647_-_unep-ea-5-l-23-rev-1_-_advance.pdf?sequence=1&isAllowed=y
- **Primary microplastics in the Ocean**
  https://portals.iucn.org/library/sites/library/files/documents/2017-002-En.pdf
- **Guidelines to tackle single use plastic products in the Mediterranean**
  http://www.cprac.org/en/news-archive/general/guidelines-to-tackle-single-use-plastic-products-in-the-mediterranean-region-a-
- **Agreementof the Council of Ministers7th June 2019 approving the envitonmental targets for the 2nd cycle of the Spanish Marine Strategies**
  https://www.miteco.gob.es/es/costas/temas/proteccion-medio-marino/anexoacuerdoccmmobjetivosambientaleseemm_web_tcm30-497743.pdf
- **Study to quantify pellet emissions in the UK**. Report to Fidra (web)
- **Options for reducing emissions of pre-production plastic pellets, powders and flakes**. Report to Fidra (ayesha, chris web)

Others:

- **Litter free is the way to be**. UfM Environment and Blue Economy division (2021)
- **Large filter feeding marine organisms as indicators of microplastics in the pelagic environment: the case studies of the Mediterranean basking shark (Cetorhinus maximus) and fin whale (Balaenoptera physalus).** Maria Cristina Fossi et.al (2014).
- **Are whale sharks exposed to persistent organic pollutants and plastic pollution in the Gulf of California (Mexico)? First ecotoxicological investigation using skin biopsies**. Maria Cristina Fossi et.al (2017).
- **Marine litter plastics and microplastics and their toxic chemicals components: the need for urgent preventive measures.** Frederic Gallo, et.al (2018).
- **Presence of plastic debris in loggerhead turtle stranded along the Tuscany coasts of the Pelagos Sanctuary for Mediterranean Marine Mammals (Italy)**. Tammaso Campani, et.al (2013).
- **Intestinal alterations in European sea bass Dicentrarchus labrax (Linnaeus, 1758) exposed to microplastics: Preliminary results**. Christina Peda, et.al (2016).

- **First evidence of presence of plastic debris in stomach of large pelagic fish in the Mediterranean Sea**. Teresa Romeo, et.al (2015).
- **Loggerhead sea turtles (*Caretta caretta*): A target species for monitoring litter ingesyed by marine organisms in the Mediterranean Sea**. Marco Matiddi, et.al (2017).
- **Bioindicators for monitoring marine litter ingestion and its impacts on Mediterranean biodicersity.** Maria Cristina Fossi, et.al (2017).
- **Wear and Tear of Tyres: A Stealthy Source of Microplastics in the Environment.** Kole, P. et al (2017)
- **Effects of microplastics on European flat oysters**. D. S. Green (2016)
- **Global phytoplankton decline over the past century.** Nature (2010)
- Chemical from tyres linked to mass salmon deaths in US found in Australia for first time. The Guardian (2022)
- **A review of emissions factors and models for road vehicle non exhaust particulate matter**. Boulter, P. G. (2006)
- **Characterisation of Exhaust Particulate Emissions from Road Vehicles**. Luhana , L. et al (2004)

Other Resources:

- Video on pellet pollution : https://www.youtube.com/watch?v=vgHOYbGY-CQ
- Pellet Watch: http://pelletwatch.org/
- Surfrider Foundation Europe: https://surfrider.eu/
- Operation clean sweep: www.opcleansweep.eu
- Plastic Soup Foundation: https://www.plasticsoupfoundation.org/
- Beat the macrobead: www.beatthemicrobead.org
- WES regional training on the problematic of SUPs in the Mediterranean: https://www.wes-med.eu/activities_type/re-1-reg-phasing-out-single-use-plastics-in-the-mediterranean/