Regional training (webinars):
Understanding better microplastics and identifying how to address the issue

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Concept Note

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1 INTRODUCTION: THE WES PROJECT

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 I and II, SWIM-Horizon 2020 SM) and strives to create a supportive environment and increase the capacity of all stakeholders in the partner countries (PCs).

The WES Partner Countries are Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Libya, Palestine, Syria and Tunisia. However, 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 neighbouring countries in the Southern Neighborhood region.

2 BACKGROUND

2.1 INTRODUCTION

Although there is still a lot of discussion around the definition of the term microplastic, for the purpose of this introduction, we will use the one proposed by J.P.G.L. Frias and Roisin Nash in their article: "Microplastics: Finding a consensus on the definition" published in 2019. This definition includes not only the question of size but also the physiochemical properties: "Microplastics are any synthetic solid particle or polymeric matrix, with regular or irregular shape and with size ranging from 1 µm to 5 mm, of either primary or secondary manufacturing origin, which are insoluble in water".[1] Microplastics can be either of primary or secondary manufacturing origin. The revised Regional Plan on Marine Litter Management in the Mediterranean defines primary microplastics as: "*tiny particles designed for direct commercial use (such as cosmetics, detergents and paints components), or for indirect use (such as pre-production pellets)*", while secondary microplastics refer to "*the fraction of microplastics in the marine environment which results from the breakdown of larger plastic items into numerous tiny fragments due to mechanical forces and/or photochemical processes, as well as from other degradation sources such as water bottles, fibres in wastewater from washing clothes and particles of rubber lost from tyres due to normal wear*".

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[2]. 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,

[1] J.P.G.L. Frias, Roisin Nash, Microplastics: Finding a consensus on the definition, Marine Pollution Bulletin, Volume 138, 2019, Pages 145-147, ISSN 0025-326X

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

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)[3] 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[4]. 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.

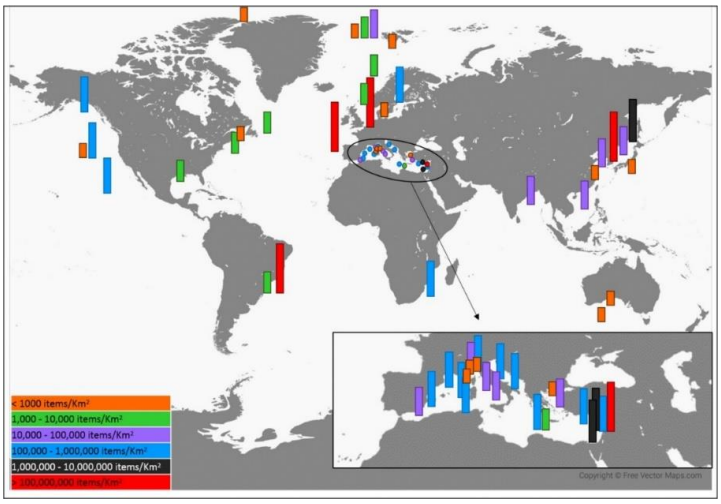

Fig. 1: Average number of microplastics floating in the Mediterranean Sea reported in the scientific literature, expressed in items per square kilometer

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.

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

[4] 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.

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.

2.2 REGIONAL CONTEXT

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 (Science Advice for Policy by European Academies 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 regional training originated from a request emanating from the Barcelona Convention Focal Points that expressed their wish to understand better the emerging issue of microplastics, their state of knowledge and which kind of action should be shaped to address this fast growing environmental and health concern.

At the same time, tackling pollution from plastics and marine litter (including microplastics) is at the core of the UfM's 2030 GreenerMed Agenda and its three priority axes of work: Support the transition to a green, circular and socially inclusive economy; Prevent and reduce pollution on land, air and sea;

Protect, preserve, manage and restore natural resources in the Mediterranean region within an integrated, ecosystem-based approach, including terrestrial, marine and coastal dimensions.

The Contracting Parties to the Barcelona Convention adopted very recently at COP22 (December 2021) an updated version of the Regional Plan on Marine Litter Management in the Mediterranean (Decision IG.25/9). The revision process of the Plan led to the incorporation of several modifications and amendments, including new definitions and measures related to marine plastic pollution and microplastics. In the initial version of the Regional Plan adopted in 2013, microlitter and microplastics were not addressed.

This WES regional activity, intends to provide a comprehensive understanding of the problematic of microplastics, current initiatives, and provide tools so that policy makers and other stakeholders can address the issue.

2.3 TARGET GROUP

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

Therefore, it is foreseen that from the WES Partner Countries, there will be:

- policy persons from the Ministry of Environment (dealing with plastics regulation) (ideally this person would coincide with a Peer appointed for the WES RE-1-REG 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 are to be invited also from the Western Balkans (Albania, Bosnia and Herzegovina, Montenegro) and Turkey.

3 OBJECTIVES AND EXPECTED RESULTS

3.1 OBJECTIVES

The overall aim of this regional training is 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.

In particular, the training will enhance 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.

3.2 APPROACH TO MEET OBJECTIVES

The regional activity will be composed of three main on-line components (Modules) that are further described in the next sections:

The Modules (sessions) are expected to last for max 3 hours and will be built based on the work of the WES experts and invited speakers; co-creation with the participants themselves (they will be invited in advance of the training to provide their level of know-how/opinion/needs/inputs via a related questionnaire (prepared and shared by the WES experts). Participants will also be invited through questionnaires and or exercises to interact and provide feedback between modules.

The content of the modules will follow the below lines:

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

The main idea behind the first part of the regional online training is to introduce the challenges related to microplastics from the technical, environmental and health perspectives. More specifically, the Module will introduce the basic terms and definitions related to microplastics, differentiating between primary and secondary microplastics. It will provide 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 will be provided.

The Module's session is expected to last maximum up to 3 hours.

Outline of Module 1: Understanding the issue of microplastics in the marine environment.

- Introduction to marine plastic pollution, definitions and characterisation
- Amounts, types, sources and effects of plastics and microplastics in the marine environment
- Knowledge gaps and research needs
- Plastics and microplastics as vectors of chemical pollutants
- Monitoring approaches
- Overview of policy advances to tackle microplastics INT/REG/

Module 2. Understanding the issue of primary microplastics: impacts, existing measures and the way forward.

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, will dive into the specifics of primary microplastics, providing a detailed introduction on the topic, including effects and impacts. WES Partner Countries (public and private stakeholders), will get acquainted with the current international and regional initiatives and frameworks to tackle the issue such as UNEA, the Barcelona Convention, the UfM, and the EU. The training will also provide an overview of specific measures implemented by public authorities, responses by the private sector and by Civil Society Organisations. For example, case studies such as Beat the Microbead campaign, that runs since 2012 by more than 100 NGOs in 42 countries globally or the Good Karma projects, will be showcased.

The Module's session is expected to last up to 3 hours maximum.

Outline of Module 2: Understanding the issue of primary microplastics: impacts, existing measures and the way forward.

- Introduction: effects and impacts (recap from previous module)
- Private initiatives to tackle the problem: the role of industry and NGOs
- Potential policy measures to address primary microplastics and examples of implementation

Case studies illustrating the above will be used throughout the session and presented by guest speakers, when possible.

Module 3. Understanding the issue of secondary microplastics: impacts, existing measures and the way forward.

The third Module of the Regional Training will take a closer look at the issue of secondary microplastics, these are mainly derived from the breakdown or fragmentation of larger plastics (SESSION A); typically, what happens when plastic items such as plastic bags or water bottles degrade. However, there is another type of secondary microplastics, the ones that derive from abrasion or erosion such as the ones generated from textiles or from tyres (SESSION B). Module three will be divided into two sessions: A and B, dedicated to each of the aforementioned types. More time will be devoted to SESSION B as SESSION A will mainly refer to knowledge transferred during the WES Regional Activity on SUPs.

The content and structure of the sessions of the third Module will follow the same logic of the second Module. Introducing first the concept of secondary microplastics and the two existing types, the sources, pathways and location as well as looking into the current situation in addressing the issue both at international and regional level. There is certainly a need and an opportunity for policy makers to tackle microplastics by enhancing existing protocols or putting in place appropriate frameworks. During this module we will address these challenges and the existing gaps in tackling the presence of secondary microplastics in the environment, particularly in the Mediterranean Sea, by looking into the current responses and actions carried out by public and private bodies and civil society organisations.

Outline of Session 3A: Understanding the issue of secondary microplastics **from fragmentation**: impacts, existing measures and the way forward.

- Introduction: effects and impacts (recap from previous module)
- Private initiatives to tackle the problem: the role of industry and NGOs
- Potential policy measures to address secondary microplastics (from fragmentation) and examples of implementation

Outline of Session 3B: Understanding the issue of secondary microplastics **from abrasion**: sources, potential measures and the way forward.

- Introduction: effects and impacts (recap from previous module)
- Private initiatives to tackle the problem: the role of industry and NGOs
- Potential policy measures to address secondary microplastics (from abrasion) and examples of implementation.

3.3 EXPECTED OUTCOMES

By participating in the webinars, the invited stakeholders will:

- Gain deepened knowledge on the problematic posed by microplastics, particularly related to their leakage into the coastal and marine environment.
- Obtain an understanding of the implications of microplastics in the environment.
- Get a clear understanding of the effects and impacts of primary and secondary microplastics.

- Learn about various measures to reduce and better manage leakage of microplastics.
- Gain knowledge on the current status of responses to manage the problematic od microplastics in the WES Partner Counties.
- Have enhanced capacity to assess the impact of various measures (private and public) opted to tackle the problem.
- Have enhanced capacity to implement policy measures to address microplastics, and monitor its presence.
- Reinforce a regional network of stakeholders dealing with marine plastic pollution in the Mediterranean.

4 CALENDAR AND LOGISTICS

The on-line training will consist of **3 consecutive 2.5/3-hour webinars** spreading over 1 month as follows:

Webinar Module 1: **12 May** | Understanding the issue of microplastics in the marine environment: amounts, types, sources, effects and monitoring approaches.

Webinar Module 2: **24 May** | Understanding the issue of primary microplastics: impacts, existing measures and the way forward

Webinar Module 3A and 3B: **2 June** | Understanding the issue of secondary microplastics: impacts, existing measures and the way forward

The webinars will be organized through video teleconferencing software with simultaneous interpretation in FR/ENG, and participants will receive brief guidelines in advance to facilitate their active participation. Further details on how to register, the agenda, support materials, etc. will be sent directly to the selected trainees.