



**United Nations  
Environment Assembly of the  
United Nations Environment  
Programme**

UNEP/AHEG/2019/3/INF/6

Distr.: General  
07 November 2019

Original: English

**Ad hoc open-ended expert group  
on marine litter and microplastics  
Third meeting**

Bangkok, 18–22 November 2019

Item 6 (e) of the provisional agenda<sup>1</sup>

Introduction to activities under the mandate of the ad hoc open-ended expert group: Scientific Advisory Committee

**Progress on the Assessment on sources, pathways, and hazards  
of litter including plastic litter and microplastic pollution;  
approach and structure**

**Note by the Secretariat**

**Introduction**

1. The United Nations Environment Assembly, at its fourth session in March 2019, requested the Executive Director of the United Nations Environment Programme (UNEP), in resolution UNEP/EA.4/Res. 6 paragraph 2, to:

*“...immediately strengthen scientific and technological knowledge with regard to marine litter including marine plastic litter and microplastics, through the following activities:*

*(b) Compiling available scientific and other relevant data and information to prepare an assessment on sources, pathways and hazards of litter, including plastic litter and microplastics pollution, and its presence in rivers and oceans; scientific knowledge about adverse effects on ecosystems and potential adverse effects on human health; and environmentally sound technological innovations;*

This shall hereinafter be referred to as the “Assessment”.

2. In response to this request, the Executive Director of UNEP has begun preparations for this Assessment, and has convened a Scientific Advisory Committee to guide and inform the implementation of paragraph 2, and in particular guide the development of the Assessment requested in subparagraph 2(b).

3. In preparing the Assessment, UNEP will undertake literature reviews where necessary, develop the conceptual approach, establish parameters for identifying gaps and areas in need of more research,

<sup>1</sup> UNEP/AHEG/2019/3/1

and generally build on the UNEP 2016 report, “Marine plastic debris and microplastics – Global lessons and research to inspire action and guide policy change”<sup>2</sup> which had been requested in resolution UNEP/EA.1/Res.6 paragraph 14. Based on the Assessment, UNEP will also recommend indicators as per subparagraph 2(c).

4. This document aims to provide an overview of progress made on the Assessment, its preparation and review process, as well as outline the purpose and function of the Scientific Advisory Committee, as information for the third meeting of the AHEG in Bangkok from 18-22 November 2019.

5. It is envisaged that following the AHEG meeting, comments and feedback will be taken into consideration and the preparation of the Assessment will proceed according to the timetable in paragraph 13 below.

### **Composition of the Scientific Advisory Committee**

6. To fulfil its mandate pursuant to UNEP/EA.4/Res.6 paragraph 2, the Secretariat issued an invitation letter (Committee Note No. 0193 (2019)) to Members States and Major Groups and Stakeholders on 19 August 2019 informing them of the UNEP Executive Director’s decision to constitute a Scientific Advisory Committee and inviting them to nominate experts to the Scientific Advisory Committee. The Terms of Reference (TORs) of the Scientific Advisory Committee were prepared by the Secretariat and shared in the same letter of 19 August ((Committee Note No. 0193 (2019) - see also Annex 2 to this note). The invitation letter was re-issued with a minor revision on 5 September 2019 (Committee Note No. 0212 (2019)), to add specific reference to Members of Specialized Agencies.

7. Over 100 nominations were received and screened by the Secretariat, including from 49 Member States (plus 1 from the European Union) and 25 accredited Major Groups and Stakeholders. The nominations were reviewed on the basis of the nominee’s educational background, professional experience, and field of expertise or specialization, per the TORs included with the invitation letter, with due consideration given to regional and gender balance.

8. In cases where more than one nominee was put forward by a Member State or Member of Specialized Agency, a single candidate was retained for the Scientific Advisory Committee, on the basis of the above criteria. As a result, one candidate from each of the 50 nominating Member States and Members of Specialized Agencies was selected, for a total of 50 Member State representatives and Members of Specialized Agencies. For Major Groups and Stakeholders’ nominations, all candidates were assessed according to these same criteria, and 17 out of the 26 candidates were retained for the Scientific Advisory Committee.

9. The Scientific Advisory Committee members have been invited to support the development of the Assessment through the provision of scientific information, data, experiences, reviews and advice. Details about the Scientific Advisory Committee’s role and specific tasks are outlined in the Terms of Reference in Annex 2 below.

10. All Member State nominations that were not retained have been invited to be part of the review process for the Assessment.

### **Approach and zero-order draft structure of the Assessment**

11. A first online consultation of the Scientific Advisory Committee took place on 17 October 2019. During this first consultation, Scientific Advisory Committee members provided feedback and advice to UNEP on a draft structure of the Assessment that had been prepared by the secretariat and shared with the Committee members for consideration. These comments were integrated into the revised draft structure of the Assessment included in Annex 1.

---

<sup>2</sup> UNEP (2016). Marine plastic debris and microplastics – Global lessons and research to inspire action and guide policy change. United Nations Environment Programme, Nairobi.  
Available online at <https://wedocs.unep.org/handle/20.500.11822/7720>

## Timeline

12. The Terms of Reference (Annex 2) include a timetable for delivery of the Assessment. The timeline has in the meantime been updated as follows:

19 August 2019	Call for nomination of experts to the Scientific Advisory Committee to Member States, Members of Specialized Agencies and accredited Major Groups and Stakeholders
04 October 2019	Scientific Advisory Committee established by the Secretariat.
17 October 2019	First online meeting of Scientific Advisory Committee to review the draft structure of the Assessment
18-22 November 2019	Report on progress of the Assessment to the third ad hoc open-ended expert group meeting in Bangkok (AHEG 3)
10 December 2019	Second online meeting of Scientific Advisory Committee to review the revised draft structure of the Assessment
10 January 2020	First order draft of the Assessment ready
10 January - 3 February 2020	Review of the first order draft of the Assessment
February 2020	In-person meeting of Scientific Advisory Committee to consider review comments and guide the second-order draft of the Assessment
March 2020	Second-order draft of the Assessment ready
April 2020	Review of the second-order draft Assessment
April 2020	Third online meeting of the Scientific Advisory Committee, on the second-order draft of the Assessment
May 2020	Presentation of key findings to the Fourth AHEG meeting
May 2020	Final online meeting of the Scientific Advisory Committee, on the Assessment
June 2020	Presentation of key findings to the 2020 UN Ocean Conference
February 2021	Submission of final Assessment to UNEA 5

13. The revised timeline supersedes and replaces the initial timeline included in the Terms of Reference (Annex 2).

**REVISED DRAFT STRUCTURE OF  
THE UNEP 2019 ASSESSMENT ON MARINE LITTER AND MICROPLASTICS**

(≈60 pages)

**BACKGROUND**

Operative Paragraph 2(b) of UN Environment Assembly resolution 4/6 requests the UNEP Executive Director, among other things to compile *“available scientific and other relevant information to prepare an assessment on sources, pathways, and hazards of litter including plastic litter and microplastic pollution and its presence in the rivers and oceans, scientific knowledge about adverse effects on ecosystems, potential adverse effects on human health and environmentally sound technology innovation.”*

**FOREWORD**

*Providing an overview of latest activities and information since UNEP (2016) report “Marine plastic debris and microplastics – Global lessons and research to inspire action and guide policy change”.*

- Update on the Ad Hoc Open-ended Expert Group and UN Environment Assembly and the need for action on marine plastic litter and debris and microplastics
- latest topline facts and figures on the global production of plastics and related sources of marine plastic litter and microplastics and also nanoplastics
- update on state of play across the world in tackling marine litter and plastics and links with the 2030 Agenda on Sustainable Development
- overview of latest understanding of the harm to human and ocean life, including impacts arising from the production of plastics and their use in manufacturing
- latest estimates of economic costs and societal impacts, and co-benefits for tackling other pollutants

**SECTION 1: SOURCES OF MARINE LITTER AND MICROPLASTICS**

*Sources of marine plastic litter and microplastics, across the lifecycle of plastics and indicating, where possible, the situation in different UN regions*

- Land-based sources: natural hazards and disasters; sectoral trends in agriculture, construction, energy, mining, packaging, personal healthcare and cosmetics, plastic producers, ship dismantling, textiles and clothing, transportation, tourism;
- management of waste from land-based sources: municipal drainage / stormwater systems, wastewater, landfill leakage, solid waste, transport;
- sea-based sources: natural hazards; sectoral trends in aquaculture, fisheries (fishing gear - wear, tear, loss and discard), maritime transport especially waste, seabed mining, offshore oil and gas exploration, port and nearshore transportation, shipping, tourism especially cruise vessels;
- management of waste from sea-based sources: end of life recycling and waste management e.g. port reception facilities;
- international and transboundary movement of waste;
- overall trends: estimates of land-based and sea-based inputs of marine litter and microplastics to the ocean, where possible presenting the regional breakdown; impacts of natural hazards and climate change; consumer behaviour

## **SECTION 2. PATHWAYS, HAZARDS AND IMPACTS**

### *Pathways and hotpots – latest knowledge and gaps*

- Chemical and physical properties of plastics: marine plastic litter and microplastics affecting transport, including the effect of biofilm formation in flotation and transport;
- freshwater, including wastewater: presence of plastic litter in urban and agricultural runoff, rivers, freshwater reservoirs, drinking water, snow and ice, coastal ecosystems and the risks of becoming marine litter; storm related outflow events;
- marine and ocean: circulation of plastic litter and microplastics in surface and sub-surface currents, ocean basin gyres, tides and coastal eddies; pelagic to the deep sea; infaunal filter species from pelagic to benthic; long-range transport patterns; extreme events;
- aerial: including avian and insect vectors populations;
- airborne transmission, including dust;

### *Hazards and impacts*

- natural hazards and climate change: increased risks to landfill security, waste storage facilities and maritime transport from storms, earthquakes, tsunamis etc.;
- other areas of concern: greenhouse gas emissions associated with plastics production; incomplete and uncontrolled combustion, particularly those containing halogens (PVC, Teflon, etc.) and BFRs, leading to unintentional release of POPs: dioxins, furans, etc.;
- nanoplastics as a potential pollutant of concern;
- impacts on human health: adverse effects of exposure to plastic litter and microplastics and consumption of microplastics and additive chemicals, throughout the food chain and freshwater supplies; specific impacts in indigenous communities;
- impacts on ecosystem health: adverse effects on freshwater, terrestrial and marine wildlife and ecosystems;
- perverse outcomes of alternative materials;
- gaps in data and identification of poorly understood processes

### *Economic aspects*

- drivers of production volumes of plastics e.g. supply of feedstocks, production and transportation costs, societal demand;
- post-consumer recovery costs of plastic.

## **SECTION 3. MONITORING, INDICATORS AND TRACEABILITY**

### *Monitoring and Indicators*

- Latest information and agreements on monitoring of marine litter and debris, especially plastics, and microplastics in all environmental media;
- methodologies: baseline definitions and approaches for different sources and sinks, locations and densities; including technologies (in-situ, floating instruments, airborne instruments, earth observation); data driven modelling;
- indicators: data, baselines and indicator methodologies;
- data sharing arrangements and platforms;
- citizen science initiatives;
- gaps in monitoring different types of litter and microplastics.

### *Traceability*

- traceability: technologies across the lifecycle of plastics and major products;
- transboundary movement of plastic waste;
- extended producer responsibility;

- product labelling and global standards;
- access to information about long-term behaviours of constituent chemicals;
- relevant manufacturing and processing standards across rent value chains.

## **SECTION 4. FUTURE PERSPECTIVES**

### *Updates on the 2016 report*

- Technologies and measures that have proven actionable/inactionable/inadequate and successful in terms of the achieved outcomes;
- guidance on new technologies and measures;

### *Policies, social norms and changing behaviours*

- policies and programmes that countries and the private sector are planning *inter alia* on Research and Development; Innovation and Product Design; Monitoring and Assessment; Waste Management; Environment and Health; Regulatory, Economic and Fiscal Instruments;
- social processes and community engagement;

### *Risk reduction approaches*

- standards in existing plastic products, including additives, biodegradability and bio-based materials, and criteria for alternatives;
- waste management, including waste separation and composting activities especially in developing countries, and marine transport of waste;
- consideration of plastic waste as a persistent pollutant;

### *Solutions and opportunities, based wherever possible on human and environmental risks, economic viability and the circular economy elements such as reduce, reuse, and recycle*

- improved materials/waste management across the lifecycle of plastics;
- eco-design and life-cycle approaches to redesign of products to favour reusability and recyclability and reduce waste generation;
- innovative economic instruments/withdrawal of perverse instruments;
- new standards including for new chemical constituents, bio-based materials and biodegradability;
- technologies for improved tracking for recovery;
- citizen clean-up programmes;
- collection of marine plastics at sea;
- tagging and marking of products and waste to increase traceability, accountability and retrieval.

## **SECTION 5. KEY RESEARCH NEEDS**

### *Which research activities are helping to accelerate knowledge into action? Where are there gaps in the short medium and long term?*

- Building a global mass balance model estimate for the next decades, to explore scenarios such as zero plastic emission or 100% waste recovery;
- transparent reporting mechanisms;
- new chemistries and materials that provide characteristics such as flexibility and recyclability;
- alternative delivery and service models;
- eco-design and sustainability issues of use of plastics and their substitutes across sectors;
- monitoring methodologies and technologies;
- environmental and health impacts;
- market mechanisms and economic instruments;
- social and behavioural analysis, cost of inaction and co-benefits of different interventions.

**SECTION 6. CONCLUSIONS AND RECOMMENDATIONS**

**SECTION 7. BIBLIOGRAPHY**

**ACKNOWLEDGEMENTS**

**LISTS OF FIGURES, TABLES & ACRONYMS**

## Terms of Reference for the Scientific Advisory Committee on Marine Plastic Litter and Microplastics

### Rationale of the Project

The UN Environment Assembly (UNEA) at its fourth session in March 2019, adopted resolution UN/EA.4/6 on Marine Plastic Litter and Microplastics, which, in operative paragraph 2 included a request to the Executive Director to:

*“Within available resources and benefiting from the work of relevant existing mechanisms, to immediately strengthen scientific and technological knowledge with regard to marine litter including marine plastic litter and microplastics through the following activities:*

*(a) Convening existing relevant science advisory initiatives with input from the Member States, as appropriate, to provide input into the activities under paragraph 3 and 7;*

*(b) Compiling available scientific and other relevant data and information to **prepare an assessment on sources, pathways, and hazards of litter including plastic litter and microplastic pollution** and its presence in the rivers and oceans, scientific knowledge about adverse effects on ecosystems, potential adverse effects on human health and environmentally sound technology innovations;*

*(c) Recommending indicators to harmonize monitoring, report and assess methodologies, taking into account the key sources of marine litter including plastic litter and microplastics in cooperation with relevant international organizations;*

*(d) Gathering information with a view to inform policies and action on environmentally sound technological innovations, options and measures for reducing risks of discharges of litter including plastic litter and microplastics to the marine environment taking into account the whole life-cycle of plastics, in support of local, national, regional and global action; ”*

In response to this request, UNEP is establishing a Scientific Advisory Committee on Marine Plastic Litter and Microplastics.

### Objective

The objective of the Scientific Advisory Committee is to guide and provide input to the preparation of the **Assessment on sources, pathways, and hazards of litter including plastic litter and microplastic pollution** herein after referred to as the “Assessment”. The scope of work is described below and is aimed at supporting the preparation and delivery of the Assessment to the fourth Ad Hoc Open-ended Expert Group on Marine Litter and Microplastics meeting in May 2020 and submission to UNEA-5 in February 2021. The Scientific Advisory Committee will convene four times through an online meeting platform and one time at an in-person meeting (in January/February 2020).

The following is the envisaged process and timelines:

Phase 1:	Establishment of Scientific Advisory Committee by September 2019 (nomination deadline 13 September 2019)
Phase 2:	Review of annotated structure of assessment by the Scientific Advisory Committee (Online meeting 24 September 2019);  Review of Zero Order Draft Assessment (Online meeting 29 October 2019)  Presentation on progress to the third meeting of the Ad Hoc Open-ended Expert Group on Marine Litter and Microplastics (AHEG), taking place in Bangkok from 18-22 November 2019  Review of First Order Draft Assessment (Online meeting 10 December 2019)  Peer review – this will include other relevant Scientific Advisory Initiatives identified as per operative paragraph 2 <sup>a</sup> .
Phase 3:	In person meeting of Scientific Advisory Committee to consider peer review comments and guide the preparation of the Second Draft Assessment (January 2020)  Final Draft Assessment prepared for review (February 2020)  Review (February-March 2020; 3 weeks)  Incorporation of review comments (March-April 2020)  Review and endorsement of Final Assessment by the Scientific Advisory Committee (Online meeting Date TBD)
Phase 4:	Presentation of key findings Assessment to fourth AHEG meeting in May 2020 and subsequent submission to UNEA-5

## Organization of Work

Scientific Advisory Committee members will be invited to support the development of the Assessment through the provision of information, data, experiences, reviews and advice including suggesting various perspectives during the process. The Scientific Advisory Committee will consist of selected scientific, policy, and legal and experts drawn from the various UN geographical regions, including representation from the Major Groups and Stakeholders.

The Scientific Advisory Committee will use the best available knowledge including building on the UNEP 2016 report “Marine plastic debris and microplastics – Global lessons and research to inspire action and guide policy change” and undertake additional literature reviews where necessary, develop the conceptual approach, establish parameters for identifying gaps, areas in need of more research, policy recommendations and participate in four (4) online meetings and one (1) face to face meeting.

After incorporating the comments and input from the Scientific Advisory Committee on the Structure, the “Zero Order Draft Assessment” will be used as a basis for additional discussions, after which the “First Order Draft Assessment” will be used to provide an update on progress to the Third Ad Hoc Open-ended Expert Group Meeting scheduled for 18-22 November 2019.

UNEP will thereafter produce a “Second Order Draft Assessment”. This will be peer reviewed and further developed during a face-to-face meeting with the Scientific Advisory Committee in January/February 2020, and subsequently finalized for final review.

The Scientific Advisory Committee’s overall tasks will be to (1) ensure that the various products are of the highest scientific quality; (2) provide sufficient advice on the structure and drafts of the Assessment and be responsive to global, regional and country needs regarding improving marine plastic litter prevention and reduction as per the resolution UN/EA.4/RES.6 OP 2. The Committee of Permanent Representatives to UNEP (CPR) will be informed and updated regularly by the UNEP Secretariat.

The “Final Assessment”, presented to the fifth session of UNEA, will serve as an information document.

## **Specific Tasks of the Scientific Advisory Committee**

- Participate and contribute actively during online meetings and the face to face meeting;
- Advise UNEP on the structure of the Assessment and other relevant issues related to the implementation of scientific and technical aspects of the resolution OP 3 and 7;
- Review and provide comments on the “Zero and First Order Drafts of the Assessment”;
- Propose peer reviewers;
- Review and provide comments on the “Second Order Draft Assessment” prior to review;
- Provide guidance to the authors on incorporating review comments
- Support the dissemination and outreach of the “Final Assessment”

## **Minimum time allocation by nominated Scientific Advisory Committee Members**

- Preparations for and attendance of online meetings of (1-2 hours each on a quarterly basis leading up to May 2020);
- Attendance of one Meeting (in person, 3 days, first quarter of 2020<sup>3</sup>)
- Review of Structure, Zero Order Draft Assessment, First Order Draft Assessment and the Second Order Draft Assessment and provide comments and recommendations to UNEP (estimated length of documents 60-80 pages).

## **Scientific Advisory Committee membership**

The Scientific Advisory Committee will be open and inclusive and consist of experts from Member States and Members of Specialized Agencies and accredited Major Groups and Stakeholders.

- Nominating entities may submit the name and *Curriculum Vitae* of several experts; however only one (1) may be selected for the Scientific Advisory Committee. The selected Scientific Advisory Committee member is expected to attend all webinars as well as the in-person meeting (sponsorship in line with UN rules and regulations)

---

<sup>3</sup> UNEP will sponsor participants from developing countries and countries with economies in transition to attend meetings (1 person per country). Non-government participants from developed countries who are not supported through their affiliation will be provided with sponsorship upon request and in accordance with UN rules and regulations.

- UNEP will carry out the selection ensuring balanced regional, technical and gender representation
- Nominees not selected will be invited to be part of the peer review in process.

Nominating entities may consider the following criteria/guidance to select nominees for the Scientific Advisory Committee:

**Technical/scientific Experts:**

- Relevant academic qualifications and record of working in relevant areas including the development of governance strategies and approaches to combat marine plastic litter and microplastics, regulatory frameworks, waste, marine pollution or in other related themes such as ecology, ecotoxicology, health, environmental economics, sociology, governance of natural resources, environmental law, etc.  
In-depth experience and knowledge related to marine litter and plastic management and/or chemicals and waste management or resource efficiency at national and regional level dealing with governance related monitoring/observation, research, planning, administration/maintenance, etc.
- Excellent scientific networks and international standing as might be evidenced and documented in invitations and memberships (keynote presentations, participation in international research consortia, working group member and/or advisor of UN agencies and/or international scientific associations and similar).
- Understanding of international projects on marine plastic litter and microplastics, sustainable consumption and production, resource efficiency, waste, ocean governance within and outside the UN system, chemicals, risk assessment.

**Policy experts/advisers:**

- Relevant professional qualification and record in natural, social and economic scientific and technological knowledge with regard to marine litter and microplastics.
- Broad experience with national and/or international policy formulation and implementation including some of the following areas: relevant regulatory frameworks, governance strategies and approaches relevant to marine plastic litter and microplastics, including sustainable management of oceans and coasts, chemicals and waste management, nature and environment, sustainable consumption and production, fisheries and other industries.
- Proven active or former linkages to international/national institutions including governments dealing with marine plastic litter and microplastics, including relevant areas mentioned above.
- Understanding of indicator-based assessment processes in intergovernmental and multi-stakeholder settings, and/or in prevention and reduction of marine plastic litter and microplastics.

**Major Group & Stakeholder representatives:**

- Professional or good working knowledge of governance frameworks and strategies related to marine litter and microplastics/Sustainable Consumption and Production, waste/chemicals management issues;
- Good working knowledge and experience on the need for measures and actions to reduce impacts of marine plastic litter and microplastics or other waste on the environment and people (health and socioeconomics).
- Accredited to UNEP<sup>4</sup>

## **Process for the establishment of the Scientific Advisory Committee**

- The UNEP Secretariat will invite Member States and Members of Specialized Agencies, and accredited Major Groups and Stakeholders to submit nominations of candidates. Self-nominations are not accepted.

---

<sup>4</sup> For more information on UNEP accreditation: <https://www.unenvironment.org/civil-society-engagement/accreditation>  
For a list of currently accredited major groups at UNEP: <https://www.unenvironment.org/civil-society-engagement/accreditation/list-accredited-organizations>

- The Secretariat will communicate the final composition of the Scientific Advisory Committee to the Government members of the UN Environment Assembly.
- UNEP will not provide any remuneration to Scientific Advisory Committee members or peer reviewers.
- All online and face-to-face meetings will be conducted in English and will be held:
  - 24 September 2019 (Online meeting)
  - 29 October 2019 (Online meeting)
  - 10 December 2019 (Online meeting)
  - January 2020 (In-person meeting)
  - March 2020 (Online meeting, Date TBD)

## **Conflict of Interest**

Scientific Advisory Committee members will be expected to act in accordance with these terms of reference and the relevant Rules of Procedure for any meeting which they attend. Members must adhere to principles of transparency, responsibility and accountability, and respect the diversity of views existing among members on numerous issues. Member who feels that he or she may have a potential or real conflict of interest should immediately inform UNEP of such conflict in order for the Ecosystems Division Director to make a determination of the suitability of such member to continue to serve as a member of the Scientific Advisory Committee. Should any member need to be replaced under such circumstances, the Secretariat will work with the nominating entity to identify a replacement.