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1st Meeting of the UNEP/EC Working Group to develop a toolkit on plastic pollution sources
Brussel, 3-4 September 2024

1st Working Group meeting - Outcome report

EC/UNEP Project on plastic pollution in aquatic environments

1st meeting - Working Group

Brussels - 3 and 4, September 2024

Outcome Report

The 1st technical meeting of the EC-UNEP project in plastic pollution in aquatic environments took place at the European Commission Charlemagne building, on the 3rd and 4th of September 2024. Over 20 participants attended the event, including working group members, project staff , and UNEP and EC representatives (full list on annex 1).

The agenda was arranged around five main sessions -Background session, Toolkit discussion, Data session, MFA discussion and Other Source categories discussion-, and participants and project staff engaged in interesting conversations around different topics of plastic pollution modelling, as detailed in the next sections.

For full agenda and meeting notes, please refer to annexes 2 and 3.

Contents

1. Discussion points

Step back

- Experts acknowledge current efforts being done by countless entities on plastic pollution modelling and praised many of these tools for their considerable outcomes; but at the same time the group recognized the necessity of a critical review upon such endeavors, to identify what is being more effective and what is going wrong, as well as current gaps and bottlenecks concerning to existent models.
- A first necessity is an overall agreement upon common terms and assumptions. Concepts need to be harmonized, assumptions need to be aligned, so methodologies can become more comparable and can better benefit from each other.
- UNECE and UN Statistics (SDG reporting) shall provide a good initial framework on data and concepts
- The project needs to establish the boundaries of its toolkit, clearly identifying what will and what will not cover.
- The toolkit should be as integrated as possible with major current methodologies, on the grounds of not creating anything new in a such wide universe of toolkits.
- The convention around concepts and assumptions should ideally be aligned with other major modelling sectors, such as carbon and water-related accounting mechanisms.
- The toolkit needs also to be cognizant of existent international agreements (Multilateral Environmental Agreements, e.g.) and other global governance frameworks (UNFCCC, CBD…) -not to mention the upcoming Plastics Treaty.

Dynamism

- Even though the different methodologies need to follow an agreed standardization, they should also take specific aspects into consideration, depending on local or situational aspects.
- One example is at city-level or local government contexts, where the toolkit should have features allowing its calibration to these small-scale cases.
- Factors concerning to the climate change and increased number of extreme events should also be considered. Two examples are the flooding events (cases on non-point pollution) that are becoming more frequent and more intense, and the cases of erosion -due to inter alia intensification of land use- that brings plastic pollution (legacy) to the surface.

- Experts suggested the consideration of environmental monitoring as part of the toolkit, allowing the identification of drivers of pollutions vis-à-vis its consequence to the environment and the analysis of ecological indicators.
- Social behavior also needs to be factored, trying to understand and anticipate people's reaction to policy intervention and market mechanisms.

Focus on what matter

- As per the project's objectives, the toolkit should focus on drivers of plastic pollution, according to the stages of plastic value chain.
- Informal sector needs to be factored in. Then, a further analysis might indicate its relevance to the final result, and if and how should be considered
- Toolkit needs to be simple, easy to operate and with actionable outputs.
- Priority should be given to key information, based on sectors/topics where information is more broadly available and reliable, as well as potential influence for the toolkit effectiveness.
- High-impact sectors/source categories may be identified and prioritized.
- Sectors/source categories with poor/insufficient data may be disregarded.

Initial agreements on an ideal prototype

- Proposition of a model with emission/leakage factors per source category to produce a national/local inventory of plastic pollution according to its source
- Source categories initially agreed
  - Plastic production (to be decided if pre-production enters)
  - Production of plastic materials/products
  - Household/consumers
  - Other sectors: fisheries, agriculture (maybe tourism, others)
  - Recycling
  - Wastewater and urban runoff
  - Solid waste management
- Material flow and spatial analysis could be concomitantly used
- Exact figures are an ideal, but not a must. Quantitative and qualitative data, as well as extrapolation exercises, might be considered (either as input or output)

2. Key takeaways

- Promote a harmonization on current models and concepts and assumptions
- Clearly establish the boundaries of the model
- Prioritise well established and national-level data

- Ensure the proposed methodology is in line with current methods and adherent to international mechanisms
- Toolkit should be flexible to adapt to different contexts (climate change, local scale, etc.)
- Keep focus on sectors and aspects where impacts are meaningful, and disregard sources/topics where data is scarce.
- Toolkit needs to be action-oriented, with a whole value chain approach.
- Emission factor per source category should be the cornerstone underpinning the toolkit

3. Actions points

1. Development of a glossary with harmonization of concepts and assumptions
2. Suggestion of new members to the WG and confirmation (or not) of their participation
3. Compilation of relevant materials in a materials depository (drive)
4. Coordinator to lead the development of a broad scoping paper, to be then transformed into a concise guiding document with the inclusion, later, of a proposition for the leakage factors; all in coordination and with feedback of WG
5. Intermediate meetings and bilaterals to be held between the coordinator and WG members
6. Next technical meeting planned for Q1 2025.

Annex 1 – Participants

	Name	Place	Institution
1	Adriana Gómez-Sanabria	Vienna (Austria)	IIASA
2	Sandra Mazo-Nix	Raleigh, North Carolina (USA)	ABT Global
3	Margherita Pucino	Lausanne (Switzerland)	WEF
4	Michael Nagy	Geneva (Switzerland)	UNECE
5	Aditi Ramola	Bengaluru (India)	ISWA
6	Hoda Karimipour (day 2)	Tehran (Iran)	International Consultant
7	Marcus Newbury	Tokyo (Japan)	UNSD
8	Marcelo Rosso	Buenos Aires (Argentina)	CEAMSE
9	Kishor Parajuli	Boston, MA (USA)	EX Research Institute
10	Zhijie Li	Bonn (Germany)	UNITAR
11	Maria Pogkozeva	Moscow, Russia	UNDP
12	Costas Velis	Leeds (UK)	University of Leeds
13	Melisa Tim Siong Lim (day 1)	Geneva (Switzerland)	BRS Secretariat/UNEP
14	Maija Bertule	Copenhagen (Denmark)	UNEP-DHI
15	Mustafa Aydin	Copenhagen (Denmark)	European Environmental Agency
16	Georg Hanke	Varese / Italy	UE-JRC
17	Janne Leskinen	Brussels	European Commission, DG Env
18	Hugo Maria Schally (day 2)	Brussels	European Commission, DG Env
19	Takehiro Nakamura		UNEP-IETC
20	Felipe Dall		UNEP-IETC
21	Alvaro Zopatti		UNEP-IETC
22	Veronika Hunt Safrankova (day 1)	Brussels	UNEP Brussels Office
23	Janyl Moldalieva (day 1)	Brussels	UNEP Brussels Office

Annex 2 – Agenda

3 September 2024

Hour	*Theme*	*Activity/speakers*	*Remarks*
9:00 – 9:30		**Arrival of participants**	
9:30 – 9:40	Opening Ceremony	1. Mr. Janne Leskinen and Mr. Hugo Maria Schally (EC DG Environment) 2. Veronika Hunt Safrankova (Head, UNEP Brussels Office) (TBC)	Welcome, opening remarks
9:40 - 10:00	Introduction of participants	Self introduction of participants	Takehiro Nakamura
10:00-10.45	Project presentation	1. Project presentation (Felipe Dall) 2. Open discussion 3. Working Group terms of reference and roles of the members	Takehiro Nakamura
1045-1100		Coffee/tea break	
11:00-12:00	Background for Toolkit Development	1. Georg Hanke Aquatic - Litter and Plastic in Europe and Beyond (EC-JRC) 2. Mustafa Aydin – EEA Work on Plastic Pollution and Marine Litter Modelling (EEA) 3. Community of Practices - Nao Takeuchi (UNEP) 4. Open discussion	Takehiro Nakamura
12:00-13:30		**Lunch break**	
13:30-15:00	Technical discussion 1 – Toolkit	1. Researcher paper - main findings and key information. 2. Presentation of toolkit proposal (scoping paper) (Alvaro Zopatti) 3. Open discussion	Georg Hanke
15:00-15:20		**Break**	
15:20-16:00	Technical discussion 1 continued	Continuation of the discussion	Georg Hanke
16:00-17:20	Technical session 2 – Data requirements	1. Data Availability and data requirements for the proposed toolkit (Felipe Dall) 2. Open discussion	Georg Hanke
17:20-17:30	**Conclusion**		Wrap up of Day 1 (Takehiro Nakamura)

4 September 2024

Hour	*Theme*	*Activity*	*Remarks*
8:45 – 9:15		**Arrival of participants**	
9:15 - 9:50	Technical session 3	Material flow analysis (Gloria) Open discussion	Takehiro Nakamura
9:50 – 10:20	Technical session 4 – Source categories	1. Plastic production, plastic products and plastic-containing products production. Existing material flow models/methodologies (Alvaro Zopatti) 2. Open discussion	Takehiro Nakamura
10.20-10:40		**Break**	
10:40-11:30	Technical session 4 – Source categories	1. Agri, fisheries, other plastic using sectors. Existing material flow models/methodologies. (Alvaro Zopatti) 2. Open discussion	Takehiro Nakamura
11:30-12:20	Technical session 4 – Source categories	1. Households, consumers. Existing material flow models/methodologies (Alvaro Zopatti) 2. Open discussion	Takehiro Nakamura
12:20-13:50		**Lunch**	
13:50-14:40	Technical session 4 – Source categories (recycling, waste management)	1. Wastewater, solid waste management. Existing material flow models/methodologies. (Alvaro Zopatti) 2. Plastic recycling 3. Open discussion	Georg Hanke
1440-1500	Technical session 4 (source categories)	1. Other land-based diffuse sources 2. Other sea-based point and diffuse sources	Georg Hanke
15:00-15:30		**Break**	
15:30-16:40	Discussion of WG WorkPlan	1. Discussion of workplan and tasks (Alvaro Zopatti)	

		2. Next WG meeting	
16:20-16:50	Key recommendations	1. Key conclusion and recommendations of the first WG meeting (Felipe Dall)	Key recommendations
16:50-17:00	**Closing**	1. EC DG Env Representative, Mr. Janne Leskinen 2. UNEP, Takehiro Nakamura	

Annex 3 - Full meeting notes (raw version)

Day 1

1. Agenda item: Project presentation

i. Marcus asked about networks in Africa

ii. Michael: recommends application cases from Canada and USA

iii. TN: suggestion of new members to WG are welcome

iv. Melissa: suggests EPR organisations in Africa, asked about output

v. Sandra: country engagement with government in Kenya?

vi. TN preliminary conversations were held w. Kenya

vii. Adriana: SDG reporting, case in Ghana

viii. Nao (Chat) Maybe from EIB, Joyce Klu (Kenyan national) based in Kenya, engaged in COPIP project and developing projects in plastic pollution.
She's from EIB and overseeing the Africa portfolio for COPIP programme.
Someone from CSIR who applied UNEP/IUCN hotspotting methodology in South Africa.

ix. Georg: some networks in Africa

x. Kishor: work in Japan on plastic pollution inventory
Ambitious deadline
Need to identify system boundaries

xi. Maria: country-level approach, or a more standardized approach, based on frameworks such as INC

xii. TN: National-level application, we'll try to reach out to Member States for dissemination

xiii. Costas: strict time, WB's Plast toolkit: it navigates 30+ methodologies, mainly Asia
It may be useful to the benefit of the project

xiv. TN this shall be discussed in Data session

2. Agenda Item: Background

2.1 JRC (Georg)

i. Definition of marine litter, countless specificities and threats

ii. Europe Marine Strategy Framework Directive: 11 descriptors, 6y cycle assessment

iii. EU science + policy on marine litter

iv. MSFD technical group on marine litter: chaired by Spain, Jersey

v. Related EU policies

vi. Related for a: G7, G20, Regional Seas, INC, GESAMP, GPML, UNDP, PAME, IMO

vii. How to identify sources: this is the right place to advance on this
1. *The ideal tool might exist, or we might start to develop here*
2. Physical pathways: *don't think we have the numbers*

viii. Environmental monitoring
My wish: *That (end of meeting) we have a clear understanding of pollution monitoring and social economic monitoring*
Guidances on this: GESAMP 2019, EU MSFD 2023

ix. Baselines
Case in EU: 2015 to 2022 number show 30% reduction ML

x. Joint list of litter categories

xi. Environmental compartments: beach/coastline, floating litter, seafloor litter, riverine litter, litter on land? Hotspots?

Not all litter size ranges in all compartments can be (need to be) efficiently monitored

We do not have yet a tool of plastic evaluation around

xii. Modelled riverine input, based on flux monitoring

xiii. Global Monitoring of Aquatic Litter:
important workshop Yokohama 2023, IMDOS, GPML

2.2 EEA (Mustafa)

i. Report to provide complete picture on tracing problem from source to sea

ii. Correlation pp waste vis a vis GDP and total waste generation (pp waste increased even in Covid, when total waste and GDP went down)

iii. EU managing waste increased yet pp waste was higher

iv. WB data, we have some assumptions

v. Spatial distribution of floating macrolitter inputs to the sea from Europe

vi. Assessment methodology

Q&A

vii. Kishor: definition of concepts: marine litter, marine trash, plastic pollution

viii. Michael: challenge on data integration; way to address this: look conceptually first, then look to monitoring framework
Finding common ground (on definitions) is a first step

ix. Nao: microp. adopted 3 mm, however INC saying less than 1 mm

x. TN: glossary is needed in this work

xi. Margherita: 2 layers of complexity on flows: from waste to land to sea (eventually), from river to sea

xii. Adriana: glossary to be aligned with international agreements
How to avoid double counting: simple indicators are required

xiii. Georg: illegal dumping from erosion phenomena

xiv. Sandra: climate events may do that more frequent

UNEP COMMUNITY OF PRACTICE (Nao)

i. GPML platform, CoP

ii. Expert meeting 2022 Copenhagen
Things discussed: data collection methodologies, modelling methodologies, plastic source inventory development.
Key outcomes: key areas harmonization, purpose for methodologies, data reliability/availability/sustainability,

iii. CoP: Waste Wise cities, WFD, PP hospotting, ISWA's Plastics calculator, Plasteax

Q&A

iv. Marcus: UNEP/UNSD questionnaire 25y, powerful source to be the standard

v. TN: definitions waste data category

vi. Georg: what additional info do we need to quantify release/leakage rates and connect that w. pollution modelling

vii. Marcelo: waste analysis made in facilities, but informal sector is acting between household disposal and final disposal

viii. Michael: reference to CES waste statistics framework,

ix. Kishor: terms used by models not consistent with existing frameworks (CES eg). We need common understanding: take a step back

x. Costas: science young, information we need cannot be found; good news is there are efforts
E.g. Correction factors (algorithms)
Underreporting on MSW
Interplay agric (plastic film) and MSW management
Now we're in position to model final disposals. Today as farther we get from pollution, lees we know
How to allocate efforts towards critical points

3. Agenda item: Technical discussion 1 – Toolkit (Alvaro)

i. Overall aspects, key challenges, source categories, why it's needed

ii. Adriana: LCA to be included to MFA? That would entail a very comprehensive approach

iii. Melissa: Basel model: emissions factor, countries can measure unintentional emissions
Here: is it feasible,

iv. TN: we're not saying leakage factors is feasible
We want to take an approach on this emission factor; can we put the EF on the source categories

v. Michel: ISIC classification, SEEA framew
Adv of using ISIC: ISIC is pivot for many other spheres

vi. TN: SIA guidelines on pollution side
LCA:

vii. Felipe: science is young, we may advance on this

viii. Georg: ready to include env assessment in the toolbox?

ix. Nao: what indicators would make sense in monitoring

x. Costas: source categories good 1st approach, maybe some changes
Let's not look what we know, let's look what we're seeing: conceptual models, then mathematical models -> emission factors to tell us we have pollution incidents
Probabilistic models
Sensitivity analysis: check estimated impacts on pollution from causal factors (policy)
Principal component analysis: linking emission factors w. other things upstream in the system that we now are important: pathway to evidence-based policy

On env monitoring: have some reservation, how use env monitoring to our benefit

xi. Georg: both things need to co-exist

xii. Maria: considering item analysis to understand group classification

xiii. Margherita: important start simple, add complexity as model's reliability increases
On social behaviour, an initial range might be acceptable

xiv. Kishor: boundaries, SIDS may have some uniqueness

xv. Georg: hypothethcial case: local has capacity to manage 200 t, and receives only 100t, yet there's pollution. Is that a signal something is leaking?

xvi. TN: can we track back the pollution event.
We envisage: dumpsite level x equals to leakage factor z.

xvii. Georg: uncertainty:

xviii. Marcelo: reality of developing countries needs to take in account, industries do not report accordingly,
Reports in Latam: GWMO and IDB were requested to harmonize terminologies

xix. Melisa: emissions of what would be accounted for?
Granularity: assessment on the scope vis a via methodology

xx. Margherita: GPAP sees mixture 1ay and 2ary data

xxi. Adriana: from identification of plastic categories you can gauge policy interventions to upstream

xxii. TN: tool should work for countries to use their own data and build their strategy from results
General understating that a comprehensive initial scope might be the way towards a more concise proposal

xxiii. Georg: it might be useful to consider few broader categories

xxiv. TN: US EPA GHG emissions calculator

xxv. Michel: scoping paper has good things, core building blocks can be discussed

xxvi. Georg: fishing gear is considered in this waste framework?

xxvii. Michel: conceptually yes, but it's challenging

xxviii. Georg: managed part we have numbers, non-managed parts we have no numbers

xxix. TN: prepare a broader conceptual model, even tough no data is available
From data broader data model, how countries can read that information

xxx. Melissa: trial to simplify all existent models in a single model?

xxxi. TN: yes. No need for exact figures, we wanna take existing models and try to see pp's boundaries and how factors can be established

xxxii. Maija: we need to learn how to prioritise key pieces of information

xxxiii. TN: we started trying to identify what data we have, data is required.
We may start with data we know we have

xxxiv. Georg: worst case scenario: no waste management,

xxxv. Gloria: HS codes

xxxvi. Costas: paper to be published tomorrow only considers MSW
Other deals with fate: 3 other models in the world
Indonesia case: model predicts that only 4% plastic waste will reach to the sea in 1y
1st time we can have this geospatial understanding

xxxvii. Maija: vicinity to the river, as starting point distance is good, but there are a lot of opportunities to better track that

xxxviii. TN: we are starting to see some initial leakage factors, considering hydrological, geographic features
On hotspots: some people use on geological locations, in MFA this is process-based, flow-based

xxxix. Georg: different timescales
Nano/micro plastic issue we know there are; yet macropl. need to be addressed first and foremost, and it'd be a great start as it's a sphere we better understand now

4. Agenda item: conclusion day 1 (Takehiro)

i. We know it might be a big challenge

ii. We have GPML work on waste, now we want to go upstream

iii. From JRC we want to understand about env monitoring

iv. From Costas we received good hints, how to use your models, how to take benefits of other ones

v.

Day 2

5. Data session (Felipe)

i. Georg: keep environmental information together
Scope should be to bring things on right track: data needed in the toolbox should match potential INC's data requirements

ii. TN: discussion between environment (data) people and data people, we still need get more connectivity

iii. Maija: monitoring in environment important, it is when you validate model's information

iv. Michel: link to energy statistics (non-energy used oil), check w. energy people - OECD/Eurostat people
Eurostat dataset 1997 packaging waste, reuse/recycling,

v. Nao: meaningful separate of production/production plastic-containing products
GPML's state of knowledge on plastic data

vi. Marcus: country own data no1 priority
Terminology: preferred sources vis-a-vis
Measurement: metric tonnes
Proportions are welcome
Hh survey: difficult to find standardized ones

vii. Adriana: simple tool
Maybe focus on consumption phase: responsible for c.70, 80%

viii. Marcelo: information from plastic production
Link production with quantity and composition of waste

ix. Maria: first look to the environment, then link to upper stages

x. Costas: do we want 7 output numbers or more empirical information for national action
If we wanna model everything: 2y, and many millions USD
Indicators: simpler, maybe more useful

xi. Mustafa: important to be observant to INC resolutions
Set of tools, methodologies; or a set of navigating, decisive assistance tools, roadmaps? If the latter, we should have more information on pollution in environment

xii. Aditi: local problems

xiii. Costas: it's clear what we need: emission inventory national level
Requires sort of modelling, emissions factors linked to emission sources
Identification of sources, and multiplication identifying type of activity and how much pollution
Modelling tools with information readily available
UN-Hab WaCT, WFD, PP calculator

xiv. Michel: clarify source categories in consumption phase (plastic production, plast products, agri, fisheries..)
Social behaviour also important for this kind of models

xv. Margherita: 4+1 tasks: inventories, mapping methodologies, comparing national cases, link causes & solutions, crosscheck

xvi. Georg: not clear about modelling approach, moving target
Spatial scale

xvii. Marcelo: mass-based, useful for waste sector so to channel the waste stream

xviii. Michel: differentiate producers, from intermediate consumption and consumption

xix. Maija: who will be the users? Critical to include what you do with this information?
Overarching elements in the 1st draft of scoping paper

xx. Adriana: not recommend tire dust now
Not waste leakage, but also leakage to aquatic environments

6. Agenda item: Material Flow Analysis and Plastic production (source category) (Gloria)

i. Gloria: Material Flow Analysis for Estimating Plastic Waste Generated

ii. Kishor: Mercury material flow in Japan

iii. Georg: Code list of technical group on marine litter

iv. Mustafa: we should look at whole spectrum, all stages

v. Kishor: Japan case: combination of data, extrapolation can be done

vi. Margherita: BPW, Plasteax

vii. Costas: major issue MSW
GWMO c.2 bi people with no access to MSW collection/wilson's study 2.5bi, New paper: 1.2bi
Gloria's: top-down approach

viii. Marcus: country-based data gathering efforts

ix. Georg: production losses, EU putting attention on pellet losses

x. Margherita: transport or transboundary movement

xi. Michel: SEEA: resident principle

xii. Mustafa: focus on SWM
How to convince countries the need to provide/research more/better data

7. Agenda item: Source categories (agri/fisheries, wastewater, recovery/recycling) (Alvaro)

Main challenges, what methodologies

Agriculture/fisheries

i. Gloria: MFA can be applied to,

ii. Costas: New tool Pew

iii. Marcus: Agric/forestry/fisheries

iv. TN: coordination with FAO on agriculture statistics reporting?

v. Margherita: tourism as a correction factor in highly touristic areas
Microplastics: tires, paints,

vi. Mustafa: maritime sector, sea-based plastics

vii. Michel: FAO works on plastics in agriculture

viii. Maria: aquaculture

ix. Marcelo: mining sector, abandoned tires

x. TN: experts from these other sectors

xi. Marcus: ISIC very comprehensive event with 4-digit subgroups
National accounts: economic systems years ahead, could be a role model

xii. Amiti: coastal communities India. Norway starting a program

Household/consumers

i. Primary/secondary microplastics

ii. Macro

iii. Adriana: Wastewater treatment: WASH data

iv. Michel:

v. Costas: litter on the go is not considered

vi. Nao: unmanaged under WFD leaked to nature from collected and uncollected waste

7. Agenda item: Hugo Maria Schally

i. EC's INC negotiator

ii. Europe approach based on CE

iii. Points on INC negotiations
1 waste management capacity vis-a-vis waste inputs
2 emphasis on upstream
3 aim to put in place a waste management more efficient and cheaper
4 different world divisions in plastic negotiations: usually north-south
Here: Consumers (LAC, Africa) producers and consumers (North), producers (Russia, GCC)
5 need to control plastic production
6 effective agreement: transparency and accountability (producers), monitoring

iv. Margherita: Questions on INC actionability
Hugo: national plans will depend on final agreement (a. voluntary or b. national plans attending to Treaty's requirements -Europe's position)
Key point: mainstreaming: integrate treaty in several policy spheres

v. Key question: do we need growth in primary polymer production?
Current level operating under full capacity (c.40-60%), so no demand, not foreseeable demand

8. Working plan

i. TN: application results

ii. Georg: Regional Seas conventions

iii. Maija working with some programmes

3.1 The participants took note of the information and work conducted in the framework of the Barcelona Convention related to riverine litter as presented by Mr Christos Ioakeimidis, QSR Programme Management Officer, Barcelona Convention Secretariat (**Presentation 1**).

3.2 A question was raised in relation to the definition of riverine litter and the metrics