



---

## Harmonization methodologies for monitoring marine plastics litter

--- For evidence-based  
policy making ---

18<sup>th</sup> July 2025

---

# Char's Text as of 1 Dec. 2024 (at the ending of INC5.1)

PREAMBLE

ARTICLE 1 OBJECTIVE

ARTICLE 1bis PRINCIPLES AND APPROACHES

ARTICLE 2 DEFINITIONS

ARTICLE 3 PLASTIC PRODUCTS

ARTICLE 4 EXEMPTIONS

ARTICLE 5 PLASTIC PRODUCT DESIGN

ARTICLE 6 [SUPPLY][SUSTAINABLE PRODUCTION]

ARTICLE 7 RELEASES AND LEAKAGES

ARTICLE 8 PLASTIC WASTE MANAGEMENT

ARTICLE 9 EXISTING PLASTIC POLLUTION

ARTICLE 10 JUST TRANSITION

ARTICLE 11 FINANCIAL [RESOURCES AND] MECHANISM

ARTICLE 12 CAPACITY BUILDING, TECHNICAL ASSISTANCE AND TECHNOLOGY TRANSFER, INCLUDING INTERNATIONAL COOPERATION

ARTICLE 13 IMPLEMENTATION AND COMPLIANCE

ARTICLE 14 NATIONAL PLANS

ARTICLE 15 REPORTING

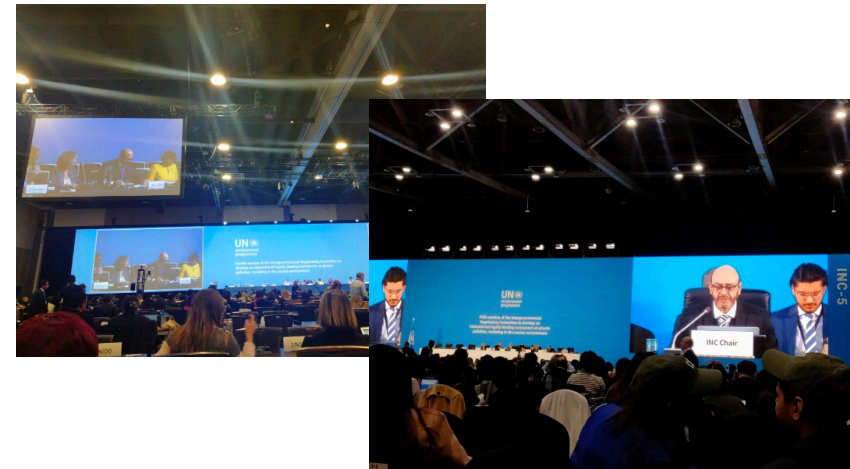
ARTICLE 16 EFFECTIVENESS EVALUATION

ARTICLE 17 INFORMATION EXCHANGE

ARTICLE 18 PUBLIC INFORMATION, AWARENESS, EDUCATION AND RESEARCH

ARTICLE 19 HEALTH

(ARTICLE 20 ~ Final provisions)



UNITED NATIONS  
United Nations Environment Programme  
Date: General  
2 September 2023  
Original: English

environmental requirements, consistent with developing international legally binding instrument on plastic pollution, including in the marine environment  
draft version  
Annex, 15-17 November 2023<sup>1</sup>  
and 4 of the proposed agenda  
negotiation of an international legally binding instrument on plastic pollution, including in the marine environment

Zero draft text of the international legally binding instrument on plastic pollution, including in the marine environment

Note by the secretariat

1. United Nations Environment Assembly (UNEA) resolution 10/4 adopted the Executive Director of the United Nations Environment Programme (UNEP) to convene an international negotiating conference, to begin on 15 July 2022, with the objective of concluding a treaty by the end of 2024. The environmental negotiating conference is to develop an international legally binding instrument on plastic pollution, including in the marine environment, which would include both land-based and shipping operations, based on a comprehensive approach that addresses the full life cycle of plastics, taking into account, among other things, the principle of the Precautionary Principle on Environment and Development, as well as climate change and other relevant issues.

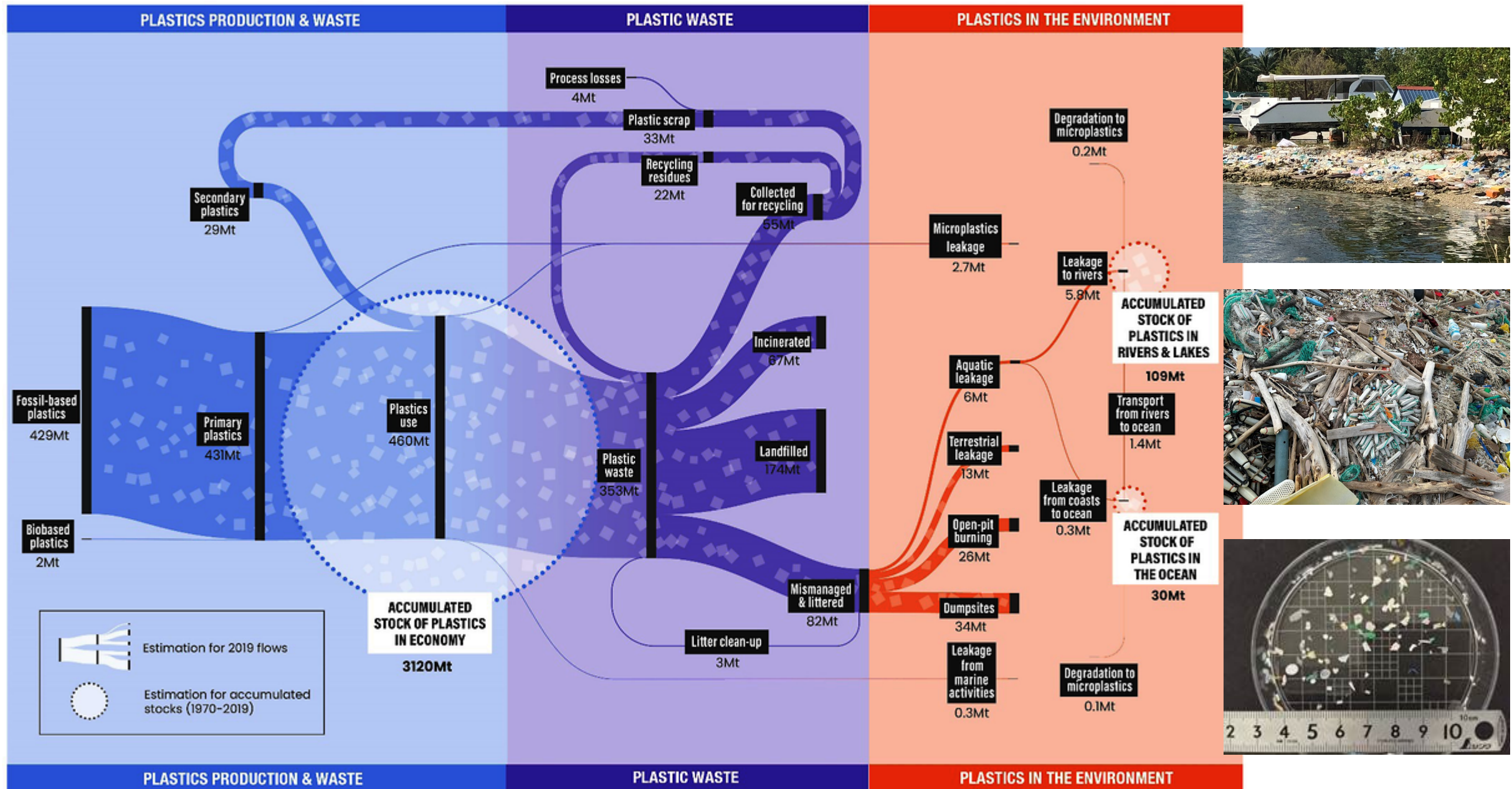
2. Paragraphs 10C.2, 10C.3, 10C.4, 10C.5, 10C.6, 10C.7 and 10C.8 of the report and the report of the secretariat, together with the annexes, are available on the secretariat's website. The full report of the secretariat is available on the secretariat's website.

3. In its second session, the conference will discuss the zero draft text of the international legally binding instrument on plastic pollution, including in the marine environment, and will also discuss the report of the secretariat on the progress of the negotiations. The full report of the secretariat is available on the secretariat's website.

4. In response to that request, the Chair has prepared, with the support of the secretariat, the Zero Draft set out in the annex to the present note for the consideration of the conference.

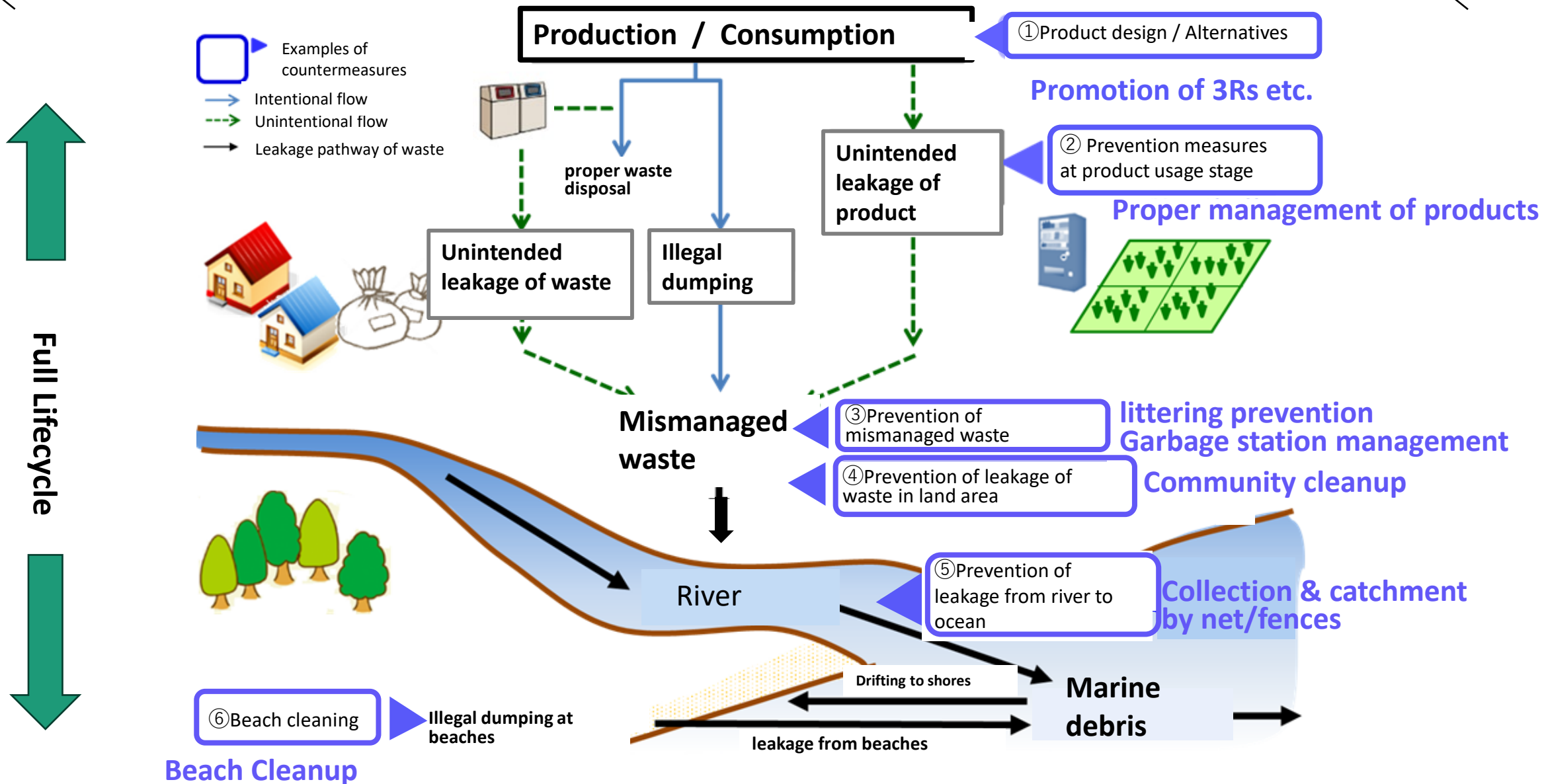
<sup>1</sup> UNEP/EA/2023/14

# Concept for estimation methodology for Assessing Pollution Levels



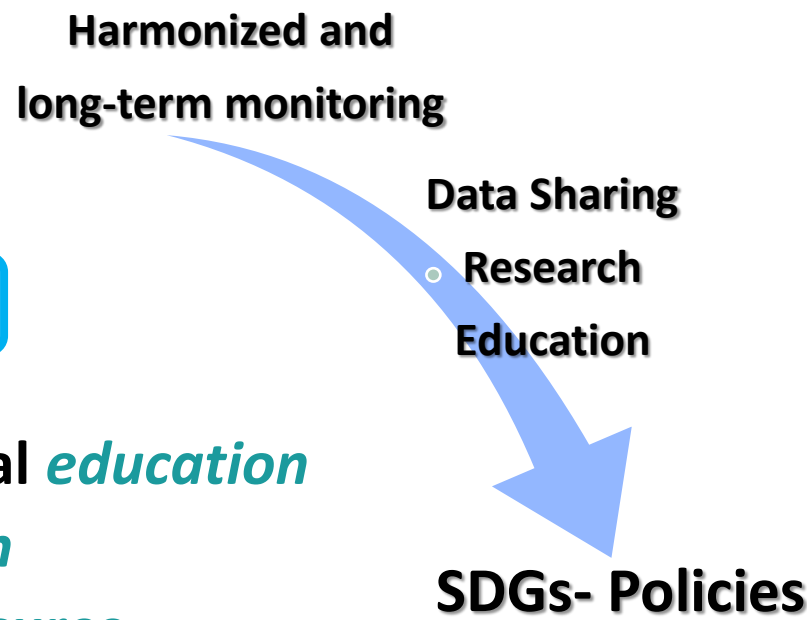
(Apply to the material stock and flow figure cited from OECD Global Plastic Outlook, 2022)

# For preventing leakage of plastics into the Environment



# Monitoring for what?

- ◆ Assessing *current pollution* levels
- ◆ Evaluating negative *impacts* on biota
- ◆ Identifying pollution *sources and hotspots*
- ◆ Forecasting *future pollution* trends
- ◆ Raising public *awareness* and environmental *education*
- ◆ Setting targets and milestones for *reduction*
- ◆ Implementing and validating *effective measures*

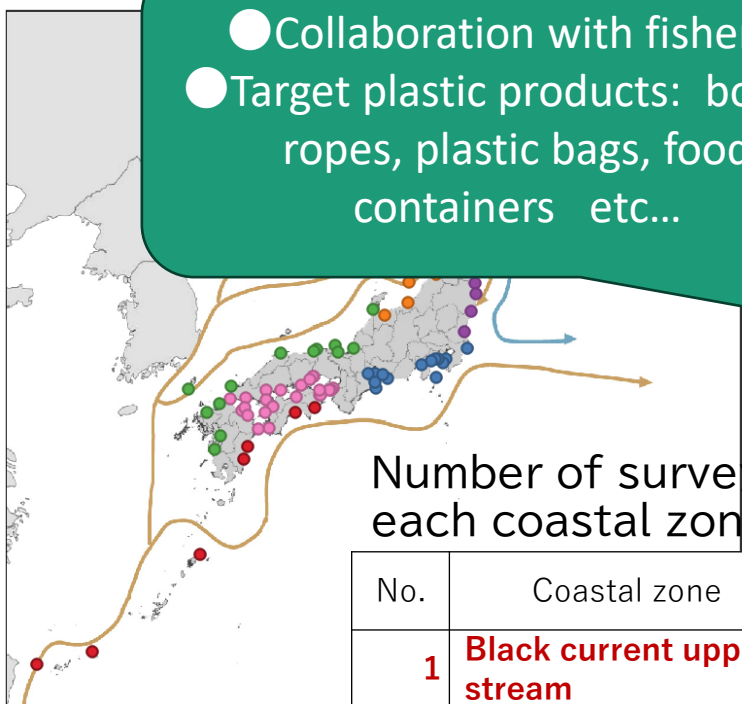


Effectively reduce global plastic pollution through evidence-based scientific approaches

From Discussed at G20 Workshop (Sept 7, 2020) “G20 workshop on harmonized monitoring and data compilation of marine plastic litter”

# Setting priority target: what kind of products?

- Collaboration with fisheries
- Target plastic products: bottles, ropes, plastic bags, food containers etc...



Number of survey point in each coastal zone

No.	Coastal zone	Survey point
1	<b>Black current upper stream</b>	7
2	<b>Black current down stream</b>	14
3	<b>Tsushima warm current upper stream</b>	13
4	<b>Tsushima warm current down stream</b>	10
5	<b>Setouchi inland sea</b>	23
6	<b>Oyashio current</b>	11
	Total	89

## Ranking of artificial litters in coastal area

	2023 data <b>by numbers</b>	number	ratio
1	short pipes for aquaculture (approx. 1.5cm) (fishing gear)	19,673	15.9%
2	bottle caps, lids	16,429	13.3%
3	fishing nets (fishing gear)	13,676	11.0%
4	beverage (PET bottle) < 1L	9,364	7.6%
5	plastic ropes, strings (fishing gear)	9,018	7.3%
6	pipes for aquaculture (approx. 10 - 20 cm in length) (fishing gear)	8,234	6.6%
7	other plastics	6,700	5.4%
8	plastic bags (opaque & transparent)	4,886	3.9%
9	other fishing gear	4,121	3.3%
10	plastic food containers (tableware, food containers, trays, seasoning containers)	3,469	2.8%

	2023 data <b>by weight</b>	number	ratio
1	trees (wood)	1,720	21.7%
2	fishing nets (fishing gear)	919	11.6%
3	plastic ropes, strings (fishing gear)	861	10.8%
4	hard plastic debris	788	9.9%
5	buoys (fishing gear)	591	7.5%
6	glasses, ceramics	483	6.1%
7	beverage (PET bottle) < 1L	426	5.4%
8	other plastics (mandatory field)	296	3.7%
9	PES float buoys	268	3.4%
10	beverage (PET bottle) ≥ 1L	236	3.0%



For policy making and its effectiveness assessment

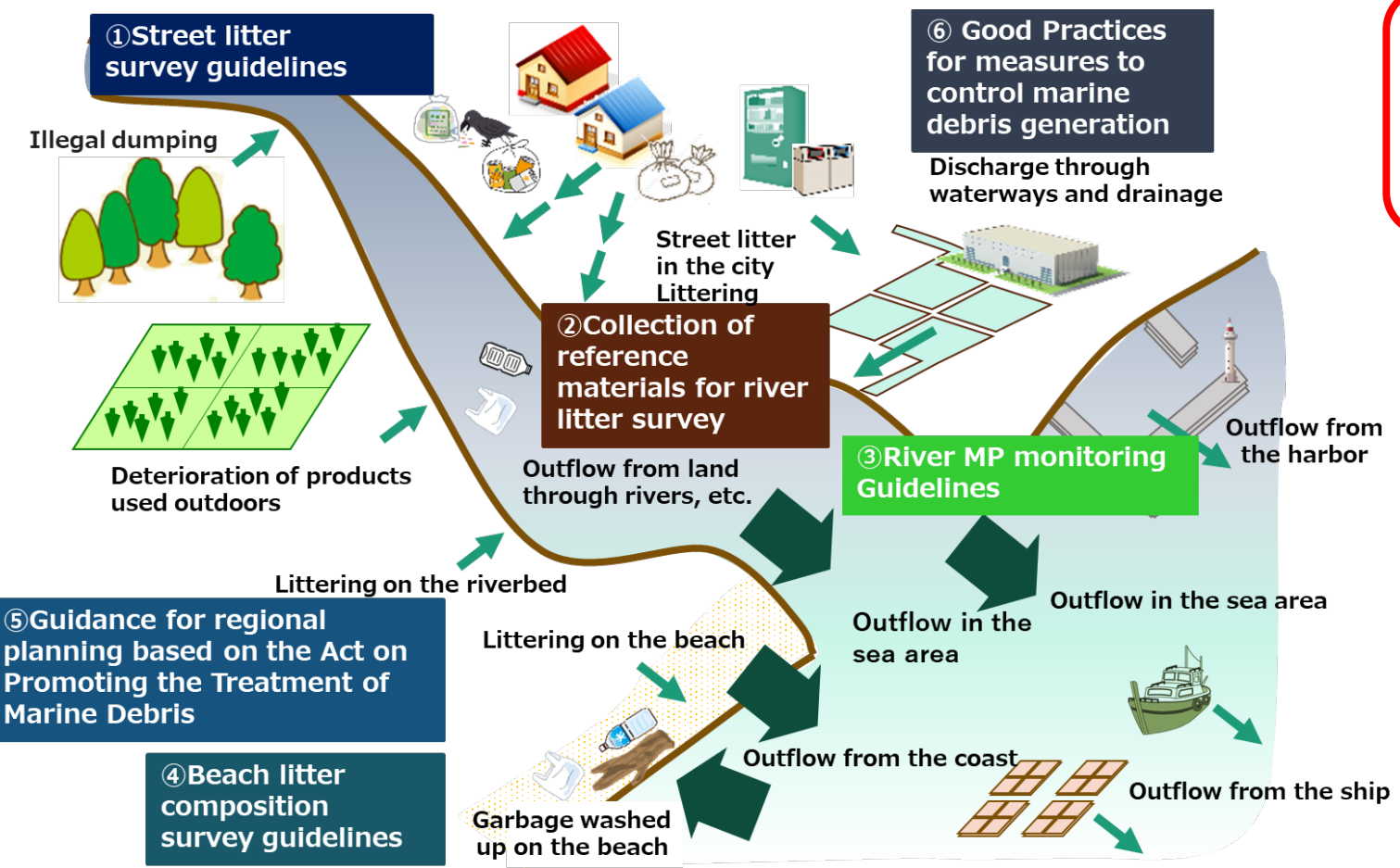
We need:

- comparable data (data quality assurance)
- wide coverage data
- historical data


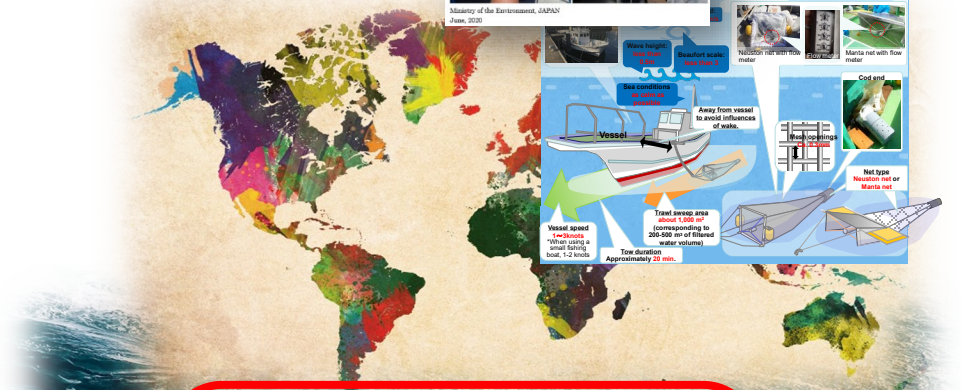
For getting the data ....

# MOE's Guidelines related to plastics discharged into Ocean

## Local → Regional → Global Monitoring/Observation System



**⑦ Guidelines for Harmonizing Ocean Surface Microplastic Monitoring Methods**





Guidelines for Harmonizing Ocean Surface Microplastic Monitoring Methods

Version 1.1, June 2020

Ministry of the Environment, JAPAN

**⑧ Guidelines for Harmonizing Marine Litter Monitoring Methods using Remote Sensing Technology (Under Development)**



↑ Mainly for Local governments in Japan

↑ Mainly for Regional/Global society

# Promoting harmonisation of marine plastic litter monitoring methods and data

## Guidelines for Harmonizing Ocean Surface Microplastic Monitoring Methods (2019 revised in 2023)

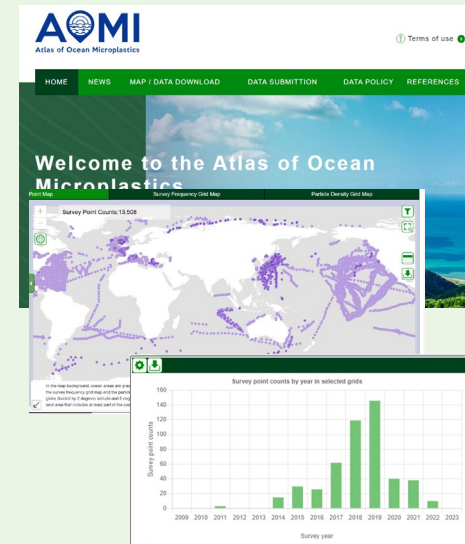
- **International guidelines** on requirements for **sampling and analysis for enabling comparability of data.**
- More than 25 experts in Japan and overseas are involved for reviewing existing guidelines, inter labo experiments, and demonstration projects using research vessels.



[http://www.env.go.jp/water/post\\_76.html](http://www.env.go.jp/water/post_76.html)

## Atlas of Ocean Microplastics (AOMI) (2024.5)

- **Global ocean surface MicP data** in a comparable format in line with the harmonized guidelines (see left side).
- Providing **open data** on MicP's distribution and abundance, and **visualizing as a two-dimensional map.**
- Promote the aggregation and use of global data.



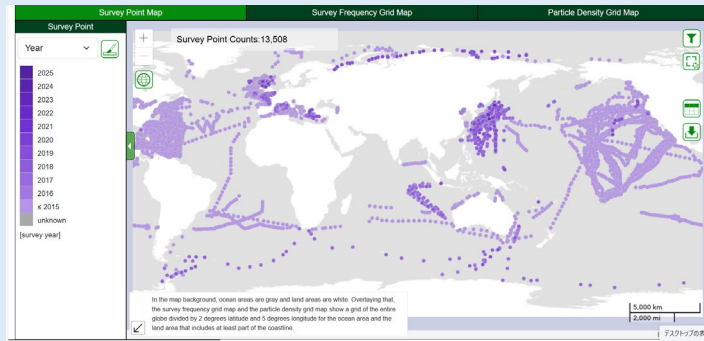
<https://aomi.env.go.jp/>

## Guidelines for Harmonizing Marine Litter Monitoring Methods Using Remote Sensing ver.2.0 (2025)

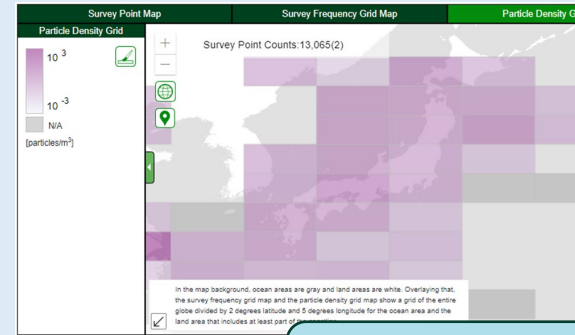
- International guidelines on requirements for **image data collection and image analysis utilising remote sensing technology**, aiming at continuous and efficient environment research of a wide area from land to sea.
- **Focused technologies: ver. 1.0=UAVs (drones), ver. 2.0=UAV + Fixed cameras.** Subsequent version is planned to expand its scope to fixed cameras, and possibly other platform, that are technically established and capable of estimating the volume of marine litters in the future.
- 16 experts in Japan and overseas are involved for its development, including reviewing existing research and demonstration project.



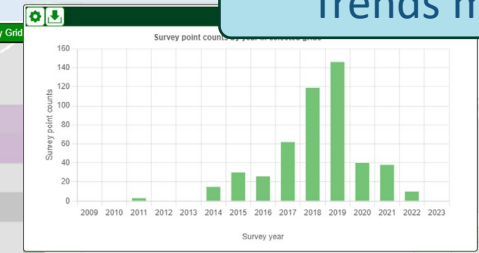
## Atlas of Ocean Microplastics



Survey point map



Density map (particle number / volume)



Trends map

### Engagement collaboration

### Evidence-Based Policy

General public



Researchers



Policy makers

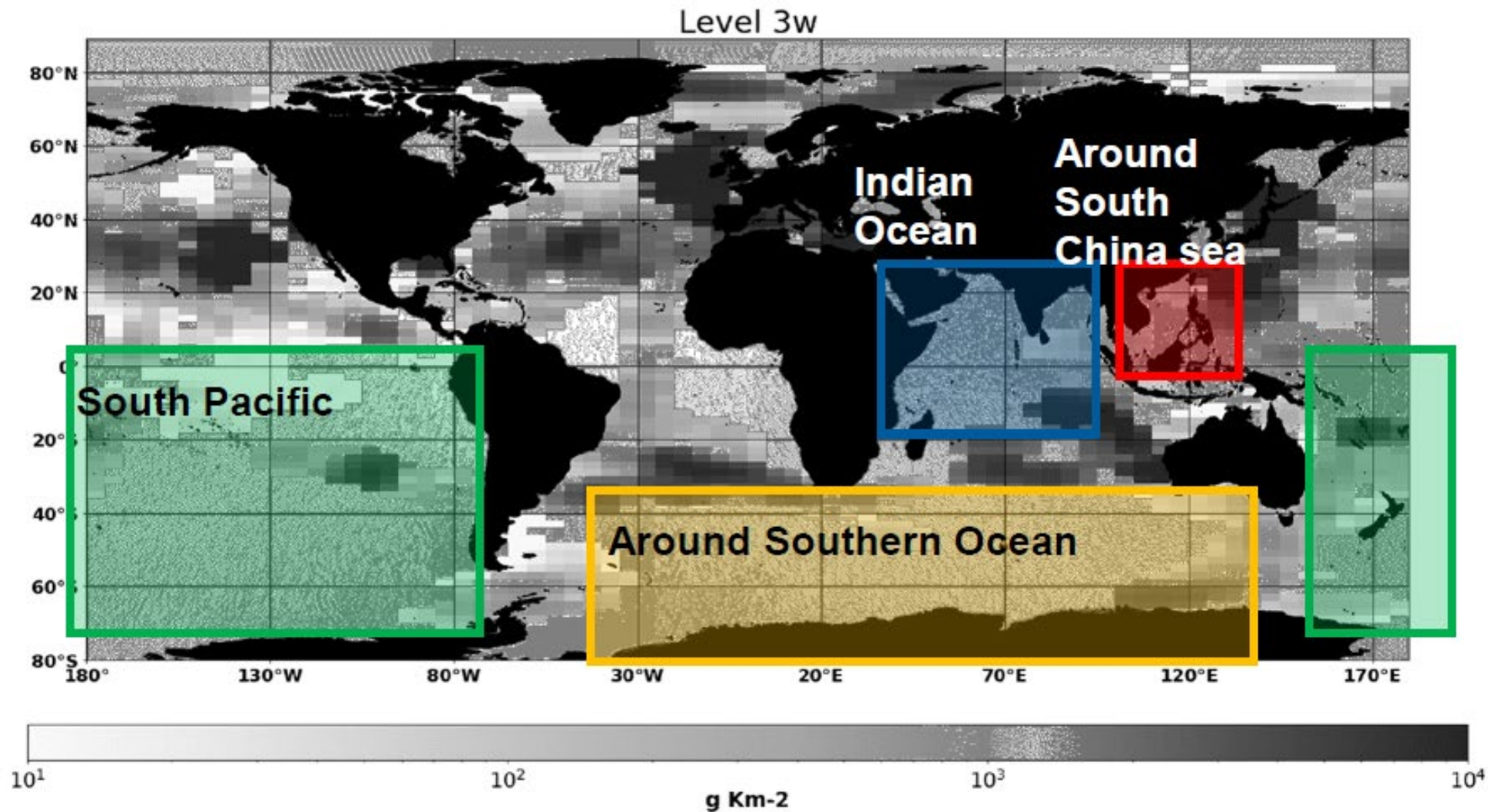


Enhance awareness of marine plastic pollution through clear and accessible information

Promote the obtention and application of harmonized data

Evidence-based measures and evaluation using global comparable data

# For understanding real picture...



- ◆ Assessing *current pollution* levels
- ◆ Evaluating negative *impacts* on biota
- ◆ Identifying pollution *sources and hotspots*
- ◆ Forecasting *future pollution* trends
- ◆ Raising public *awareness* and environmental *education*
- ◆ Setting targets and milestones for *reduction*
- ◆ Implementing and validating *effective measures*

Harmonized and  
long-term monitoring

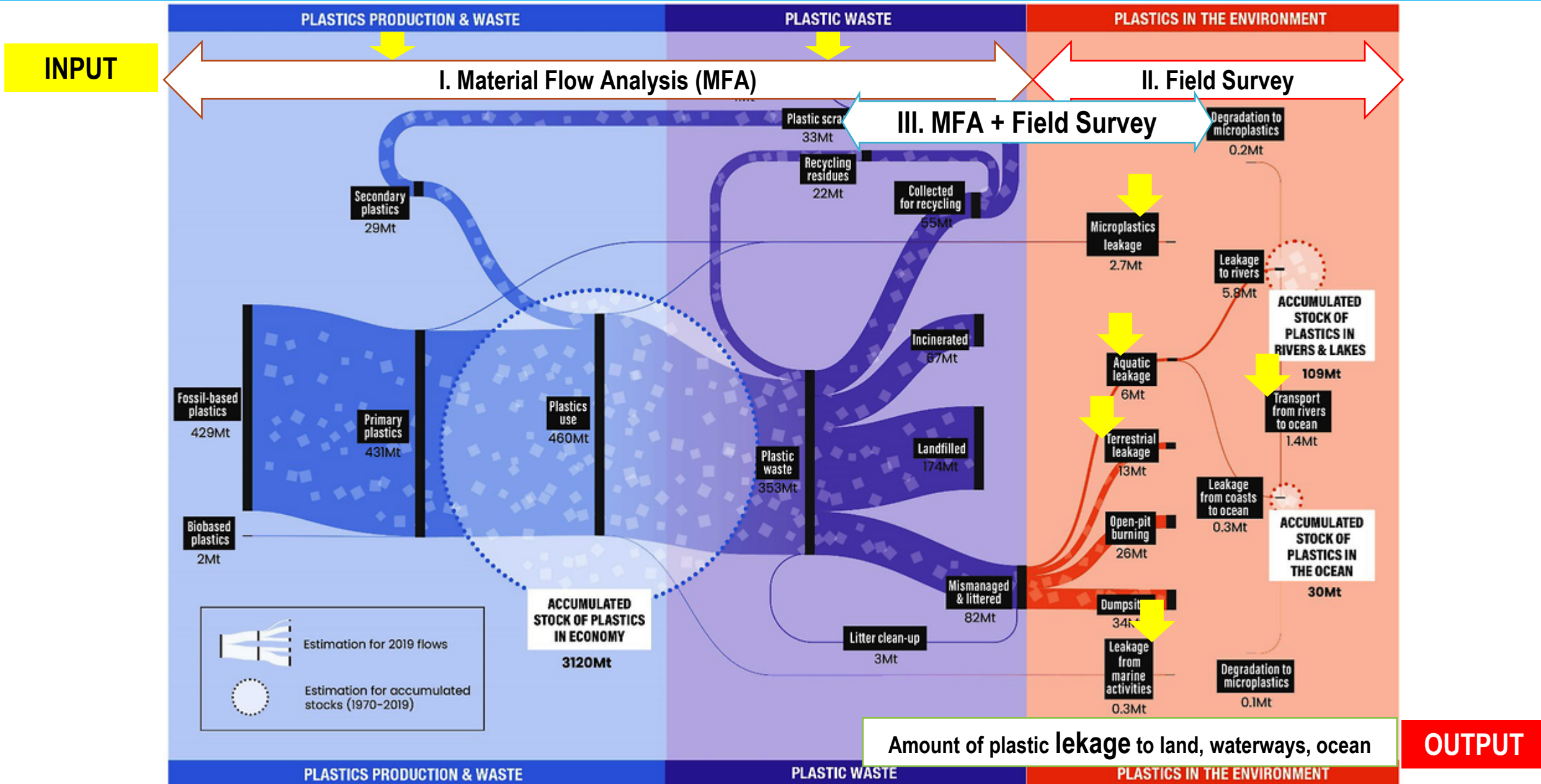
Data Sharing  
• Research  
Education

SDGs- Policies

Effectively reduce global plastic  
pollution through evidence-based  
scientific approaches

From Discussed at **G20 Workshop (Sept 7, 2020)** “G20 workshop on harmonized monitoring and data compilation of marine plastic litter”

# Concept for estimation methodology for Assessing Pollution Levels



(Apply to the material stock and flow figure cited from OECD Global Plastic Outlook, 2022)

# Classification of Existing Estimation Methods

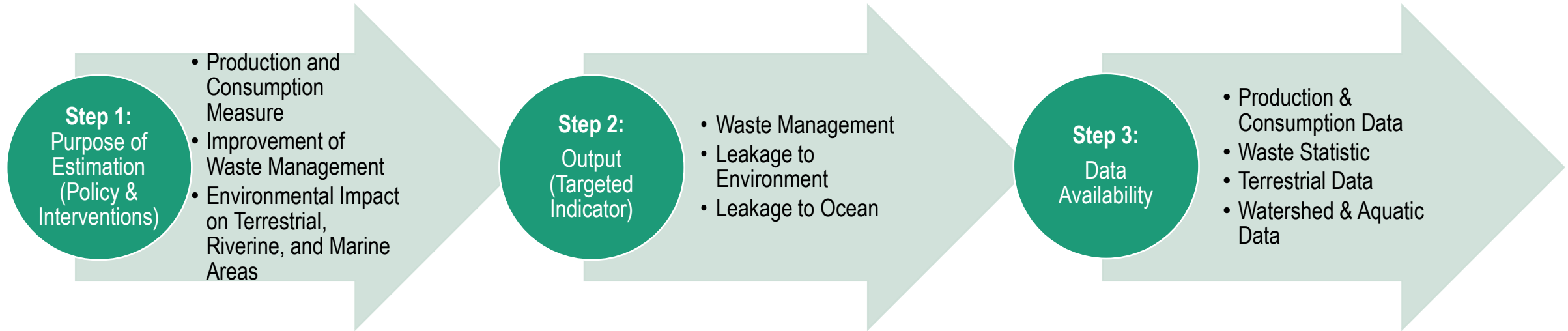
Main Input Data			Existing method	Life cycle*					Data Source, Model, National Statistic, Leakage rate	Stakeholder / Measure		
				P	C	W	E	O		Stakeholder	Indicator	
1	M1	Production & Consumption (total plastic, sector, polymer)	<ul style="list-style-type: none"> <li>Nakatani et al., 2020</li> <li>UNITAR, 2023 (Toolkit for the Product-Lifespan Method)</li> <li>OECD, 2020 (ENV-Linkages Modelling Framework)</li> </ul>						ENVI/CGE, Input-Output Table, Physical Supply and Use Tables	Ministry of Industry, etc.	Reduction, Substitution, SUP reduction/phase-out, green procurement, etc.	
		Production & Consumption (item)	MacP	<ul style="list-style-type: none"> <li>MOEJ, 2024 (specific sector) and others</li> </ul>								National Statistic, Discharge rate, etc.
			MicP	<ul style="list-style-type: none"> <li>MOEJ, 2024 (PET bottle estimation)</li> </ul>								National Statistic, Discharge rate, etc.
		MicP	<ul style="list-style-type: none"> <li>ECHA, 2020</li> <li>ICF&amp;Eunomia, 2018</li> <li>UNEP, 2018</li> <li>MOEJ, 2024 (specific sector)</li> </ul>						National Statistic, Discharge rate, etc.			
2	M2	Waste Management	Waste Flow	<ul style="list-style-type: none"> <li>GIZ, 2020 (Waste Flow Diagram (WFD))</li> </ul>						National Statistic, etc.	Ministry of Environment (MOE), Ministry of Interior (MOI), Local Government (LGs), etc.	3Rs, improved waste collection, EPR, various recycling schemes, introduction of WtE, improved landfill sites, etc.
				<ul style="list-style-type: none"> <li>Basel Convention, 2022 (Toolkit for Material Flow Analysis Method)</li> <li>University of Leeds, 2019 (ISWA Plastic Pollution Calculator (PPP))</li> </ul>						National Statistic, Discharge rate, etc.		
				<ul style="list-style-type: none"> <li>GPAP, 2022 (National Analysis and Modelling (NAM) Tool)</li> <li>Cottom et al., 2024 (SPOT Model)</li> </ul>						Global, National Statistic, Statistic model, etc.		
3	F	Field survey and Monitoring	Coastal and other Land Field Measurements	<ul style="list-style-type: none"> <li>CSIRO and COBSEA, 2024 (Regional Assessment on Marine Litter in the East Asian Seas)</li> </ul>						Survey, Statistic model	MOE, LGs	Mitigation measures (Collection, Awareness-raising, etc.), Impact assessment of the mitigation measures
				<ul style="list-style-type: none"> <li>MOEJ, 2024 (Beach litter survey)</li> <li>S-19 (Environment Research and Technology Development Fund)</li> </ul>						Survey, extrapolation		
			Aquatic (mainly Riverine) Field Measurements	<ul style="list-style-type: none"> <li>Nihei et al., 2020</li> <li>Schmidt et al., 2017</li> <li>S-19</li> <li>van Emmerik et al., 2019</li> <li>Lebreton et al., 2017</li> <li>Meijer et al., 2021</li> <li>World Bank et al., 2021</li> </ul>						Survey, Statistic model	MOE, Water & Marine related departments, LGs	
				<ul style="list-style-type: none"> <li>Mellink et al., 2022</li> <li>MOEJ, 2024 (Pumping station survey)</li> </ul>						Survey, Discharge rate, Statistic model		

(Reference: The estimation methods used by OECD (ENV-Linkages model + UOL + DTU) and UNEP (National Guidance on Plastic Pollution Hotspotting and Shaping Action) integrate data from both M1 and M2.)

\* Blue: Data Input, Yellow: Output, P: Production, C: Consumption, W: Waste Generation/Management, E: Leakage to the environment, O: Leakage to the ocean

# Harmonized Guidelines for Selecting Practical Estimation Methods

Three steps for selecting practical estimation method based on the classification table (previous page)



## Draft table of contents of the guidelines

- 1. Background and Objectives**
  - Current status and challenges of global plastic pollution
  - INC discussion on plastic inventory, leakage estimation, research, scientific evidence, NAP, and monitoring, etc.
  - Japan's knowledge, experience, and international cooperation
- 2. What is an Inventory**
  - Current status and challenges of inventory, monitoring, and estimation
  - Science-based policy decisions and interventions
- 3. Target, Scope, and Scale**
  - Policy maker, Practitioner, Researchers, etc.
  - Objectives of leakage estimation, estimation scale, dataset for estimation
  - Definition of terms
- 4. Categorization of Estimation Methods**
  - Introduction of Japan's inventory and methods
  - Categorization of existing plastic leakage estimation methods
  - Overview of existing plastic leakage estimation methods
- 4. Development of Estimation Method**
  - Purpose of estimation, Definition of terms, Confirmation of necessary data, Feasibility of actual surveys, Setting of baseline year, Estimation frequency, and Scientific policy development and interventions
  - Decision tree / Estimation options (including Tier approach)
- 5. Pilot Cases**
  - Indonesia
  - Thailand
  - Vietnam

**Classification of existing estimation methodologies**

Main Input Data	Existing method	Life cycle	Data Source, Model, National Statistic, Leakage	Stakeholder / Measure
Production & Consumption (total plastic, sector, polymer)	Nishitani et al., 2020 UNEP, 2023 (Toolkit for the Production & Consumption of Plastics) OECD, 2020 (ENV-Leakage) MOE, 2024 (Leakage to Environment)	Supply and Demand	Ministry of Industry, etc.	Reduction, Substitution, SUP, reduction/zero-out, green procurement, etc.
M1 Production & Consumption (Item)				
M2 Waste Management			Ministry of Environment (MOE), Ministry of Interior (MOI), Local Government (LG), etc.	SIs, improved waste collection, EPR, various recycling schemes, production of IVE, improved landfill sites, etc.
F Coastal Land Field Measurements			Survey, Statistic model	MOE, LGs
F Aquatic (mainly Riverine) Field Measurements	Nishi et al., 2020 van Emmen et al., 2019 Mejer et al., 2021 MOE, 2024 (Pumping station survey)	Schmidt et al., 2017 Lebraton et al., 2017 World Bank et al., 2021	Survey, extrapolation Survey, Statistic model	Mitigation measures Collection, Awareness-raising, etc. Impact

**Flowchart for deciding appropriate methodology**

ありがとうございました！

Thank you!

---

- Dr. Noriko TAMIYA-HASE
- Deputy Director, Office of Policies against Marine Plastics Pollution
- Marine Environmental Division
- Ministry of the Environment, Japan

