

# Plastic Waste Data Collection: Current Practices, Key Challenges and Strategies

ADB Regional Workshop on Strategies for Plastic Waste Data Collection and Management – Foundations for National and City Action Plans  
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## C. Visvanathan

Professor

Department of Civil and Environmental Engineering,

Faculty of Engineering,

Mahidol University, Thailand

Email: [visuvaru@gmail.com](mailto:visuvaru@gmail.com), [visvanathan.che@mahidol.ac.th](mailto:visvanathan.che@mahidol.ac.th)

Webpage: [www.eg.mahidol.ac.th](http://www.eg.mahidol.ac.th)

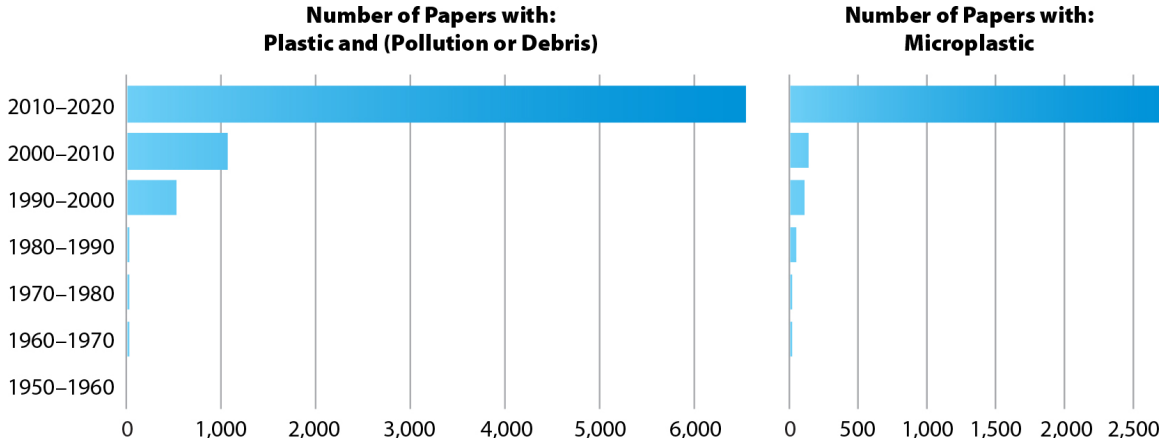


**“Plastics on the Sargasso Sea Surface”** - first scientific findings of marine plastic debris (Carpenter et al., 1972; Carpenter and Smith, 1972)

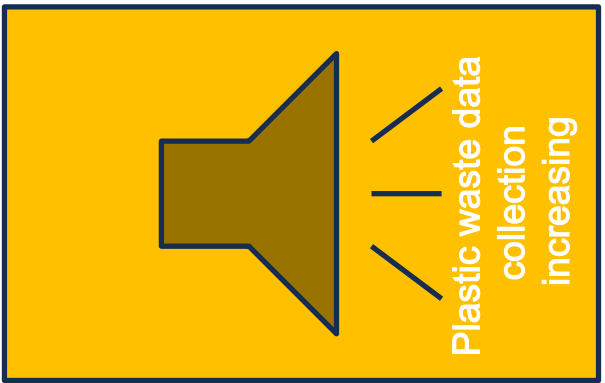
Captain Charles Moore discovery of **“Great Pacific Garbage Patch ”** in 1996

**Plastic waste inputs from land into the ocean** (Jembeck et al. 2015)

**River plastic emissions to the world’s oceans,** (Leberon et al. 2017)



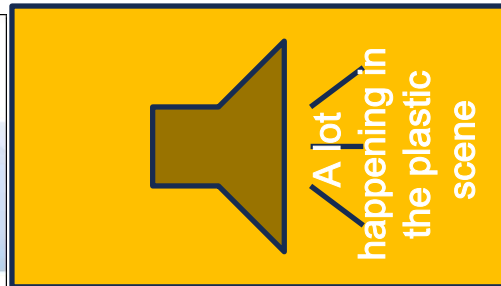
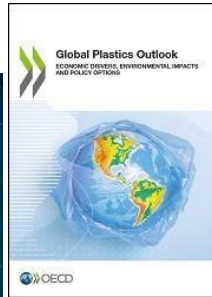
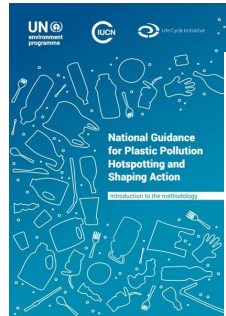
Graph showing the number of papers that have appeared in the Web of Science Core Collection each decade from 1950 through 2020 using search terms “plastic and (pollution or debris)” (left) and “microplastic” (right).



Plastic waste data collection/assessment/research carried out by different parties : national government, national/international NGOs, academia, research institutes, private sector (plastic industry, recycling associations), and citizen science

Different methodologies, tools, and guidelines are in place

Different countries are at different level of plastic data collection in terms of technical skills, resources, availability of local data



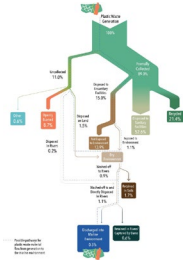
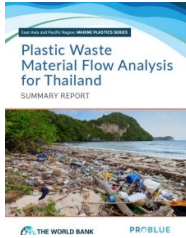
*MFA is the methodology used*



$$\text{Input (extractions + produced + imports)} = \text{Output (consumed and in use + waste + exports)}$$



Scope of the MFA differs according to the objective of data collection – decides how to read the data/result



This World Bank study presents the first large-scale assessment in Thailand to integrate national municipal solid waste (excludes plastic waste that originates from maritime activities) generation and waste management performance data with actual hydrological conditions to estimate how mismanaged plastic waste is carried and discharged into the marine environment

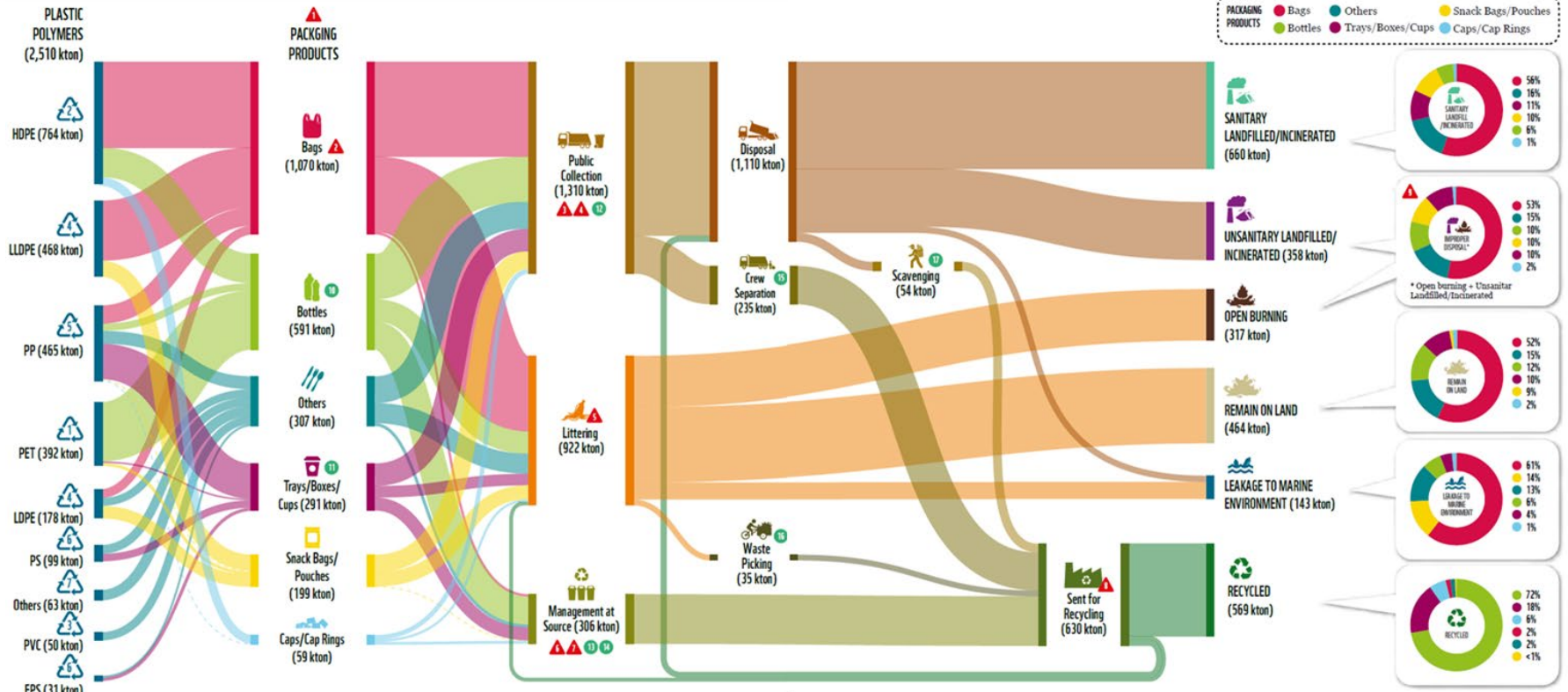


Plastic material flow and value chain analysis (Thailand)  
CHULALONGKORN UNIVERSITY



Chulalongkorn MFA is focusing on **6 types of single use plastics** (plastic bags, bottles, food containers, cutlery and other packaging items) - production, consumption, recycling and estimation of leakage

WWF Thailand, Mae Fah Luang University



Source: WWF Thailand, 2022

Upstream

Downstream



## Plastic production

- Chulalongkorn University
- Plastics Institute of Thailand
- UN Comtrade database, Customs Office, Industry report,



## Consumption

- Plastics Institute Of Thailand



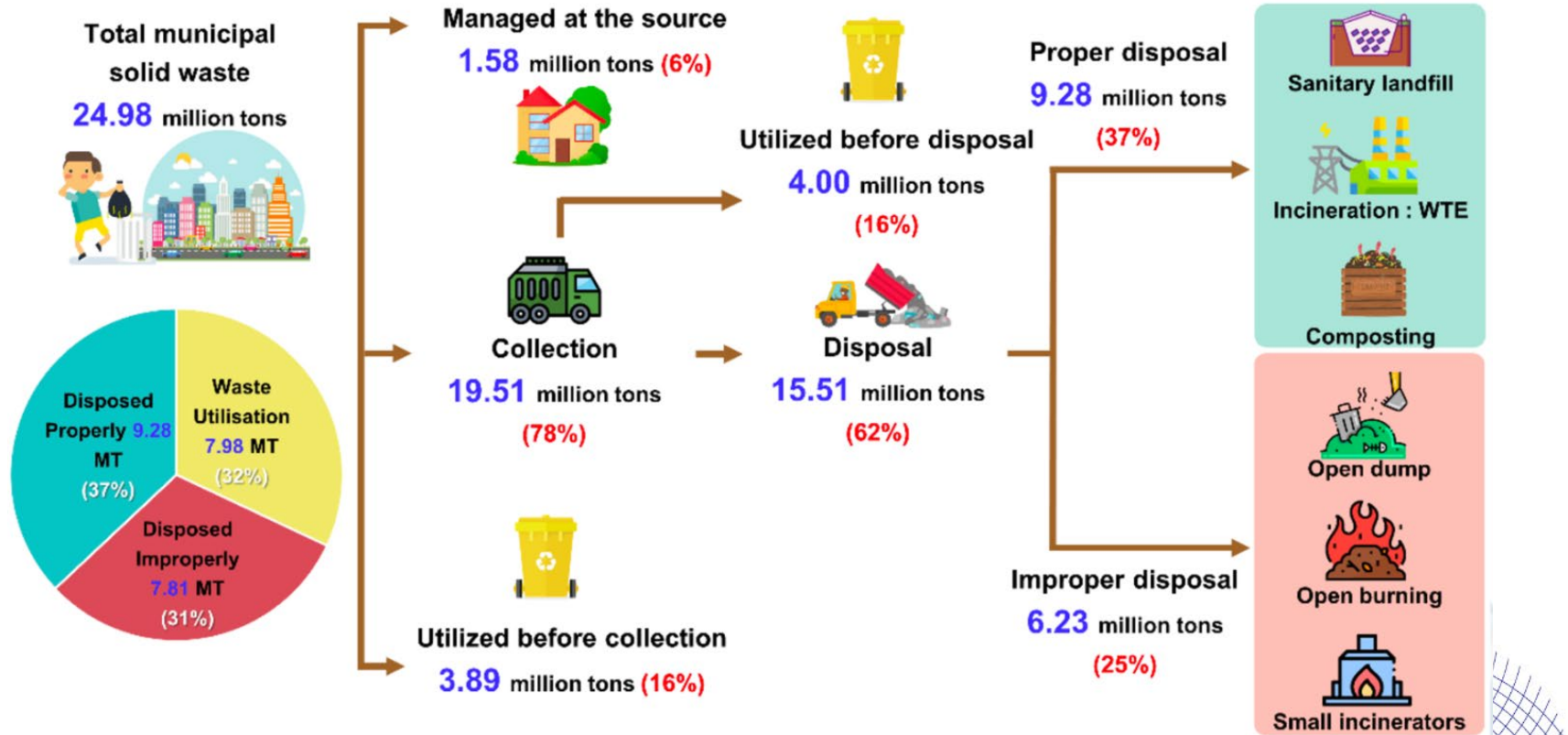
## Collection

- The PCD: formal collection and recycling  
(<https://thaimsw.pcd.go.th/report1.php?year=2564>)
- NSO: the treatment of uncollected waste  
([https://ittdashboard.nso.go.th/preview2.php?id\\_project=72](https://ittdashboard.nso.go.th/preview2.php?id_project=72))
- BMA  
(<https://webportal.bangkok.go.th/environmentbma/page/sub/7405/สถิติปริมาณมูลฝอย>)



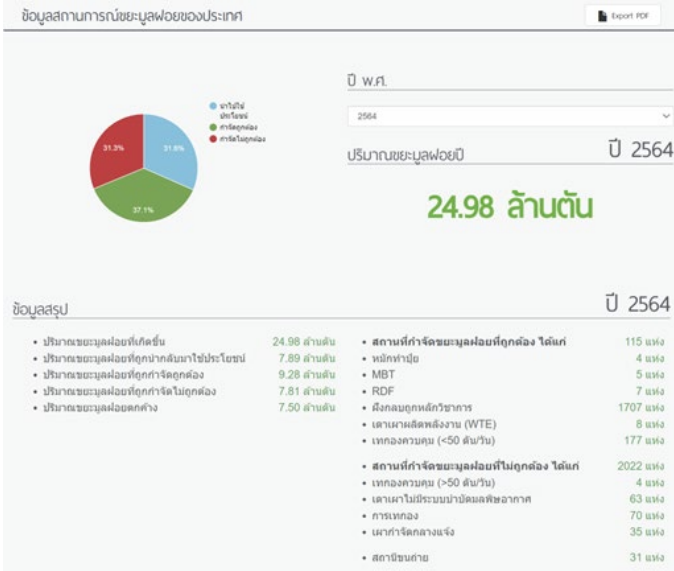
## Leakage

- Marine debris data collection: Thailand Coastal Cleanup (TCC), Department of Marine Coastal Resources (DMCR) data center  
(<https://www.dmcr.go.th/infoAll/191>)
- **Estimation & Gestimation**



# Plastic waste proportion in MSW – Estimation

Pollution Control Department (PCD):  
collect and report (million tons/year)



Collect: Total municipal solid waste  
(million tons/ year)

Estimate 12%  
Of total municipal  
solid waste



*Still holds true?  
Need update this  
estimate -*

Plastic waste (million tons/year)

National Statistical Office (NSO):  
analysis and report (tons/day)



Source: [https://ittdashboard.nso.go.th/preview2.php?id\\_project=72](https://ittdashboard.nso.go.th/preview2.php?id_project=72)



Plastics Market, Volume CAGR (%), by Product Type, Thailand, 2023 - 2028



	Bio degradable	Non biodegradable
Bio based	Bio Based & Biodegradable PLA/PHAs/PBS/Starch	Bio Based/Non biodegradable Bio PE/Bio PP/Bio PA/Bio PET/ Bio PTT
Petroleum Based	Petroleum Based & Biodegradable PBAT/PCL	Petroleum Based/Non biodegradable PE/PP/PVC/PET

Source: European-bioplastics

Source: <https://www.mordorintelligence.com/industry-reports/thailand-plastics-market>

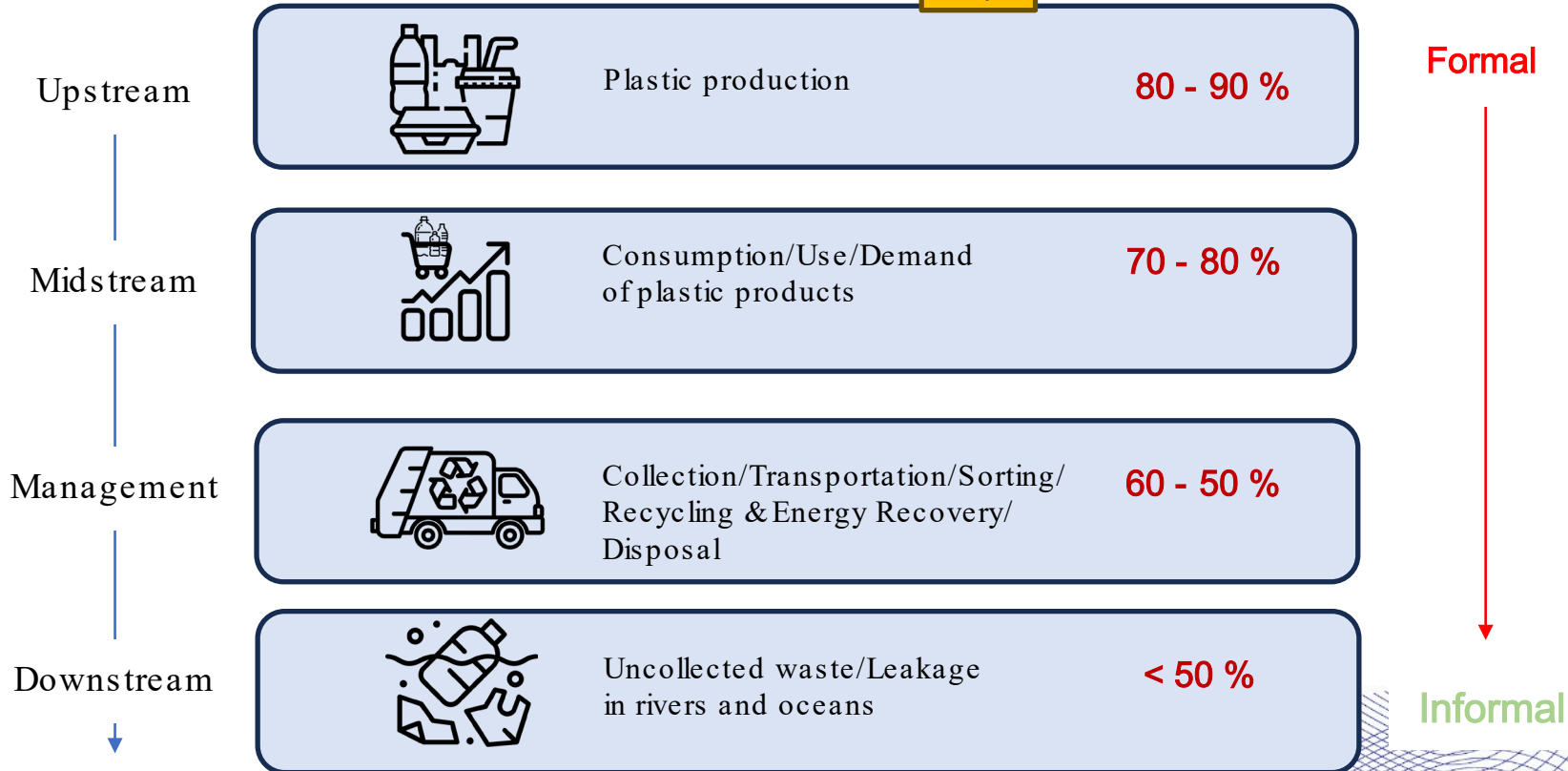


*Data/MFA of single use plastics and packaging available. However, downstream fate of alternative plastics like bioplastic is not available.*

Source: [https://www.oie.go.th/assets/portals/1/fileups/31/files/OIE%20SHARE\(April%2064\).pdf](https://www.oie.go.th/assets/portals/1/fileups/31/files/OIE%20SHARE(April%2064).pdf)



Availability  
& Reliability of Data



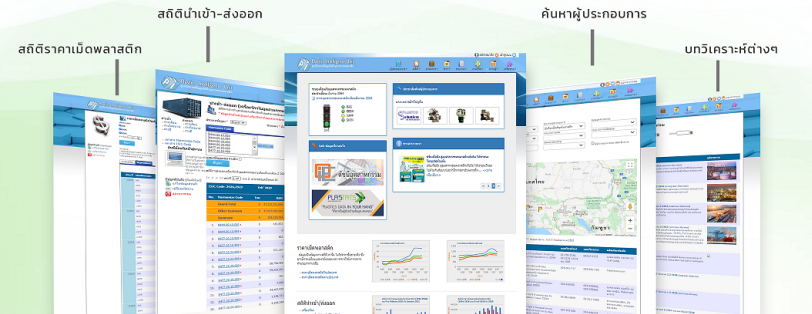


Plastic Industry, recycling businesses are also keeping record of important data like production, recycling and recovery

## PLASTICS INTELLIGENCE UNIT

ศูนย์วิเคราะห์ข้อมูลเชิงลึกอุตสาหกรรมพลาสติก

<http://plastic.oie.go.th/>



สถิตินำเข้า-ส่งออก      ดินหาผู้ประกอบการ      บทวิเคราะห์ต่างๆ

สถิติราคาเม็ดพลาสติก



PLASTATS  
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WWW.PLASTATS.COM



Thailand Institute of Packaging and Recycling Management  
for Sustainable Environment  
The Federation of Thai Industries

TIPMSE  
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Projects | News & Activities | TIPMSE Learning Center | Recycle Society Event | Links | Contact Us | Site Map

Packaging Database  
Download  
Information Service  
Training Courses  
TIPMSE E-news  
Meeting Room Service

Recycle Database  
TIPMSE Recycle Network Database

Organization	Website
Bangkok Metropolitan Administration	<a href="http://www.bma.go.th/">http://www.bma.go.th/</a>
BIO	<a href="http://www.thaipe.com">http://www.thaipe.com</a>



Businesses/Brands are also publishing plastic footprint /impact reporting



Types of plastic utilized in Thailand in 2020

Source: Petroleum Institute of Thailand  
(PTIT DATA, Modified by PITH)



Source: Plastic Institute of Thailand



Bag in bag culture street food



Informal waste collector

Source: <https://www.bloomberg.com/news/articles/2020-01-22/bangkok-street-food-stalls-are-trying-to-give-up-plastic-bags?embedded-checkout=true>  
<https://www.sei.org/about-sei/press-room/walking-with-bangkoks-waste-pickers/>

## International legally binding instrument on plastic pollution, including in the marine environment

### Reporting on progress

“Each Party shall monitor and track the types and volumes of its production, imports and exports of chemicals and polymers used in the production of plastic polymers, plastics and plastic products, and regulated plastic products across their life cycle.”

### International co-operation

“Parties shall promote international cooperation in support of the objective of this instrument\* through

c. The promotion of technical and scientific cooperation, including **regional platforms or databases** , technical-scientific cooperation projects, and networks of technical centres;

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Zero draft text of the international legally binding instrument on plastic pollution, including in the marine environment.  
<https://wedocs.unep.org/bitstream/handle/20.500.11822/43239/ZERODRAFT.pdf>

## Tools/Technologies



Macroplastic

- Fish net
- pLitter (CCTV)
- Trash boom
- Manual collection
- Plankton net

## Assessments

- Transect survey
- Macroplastic in river
- Annual report



Trash boom



pLitter (CCTV)

## Tools/Technologies

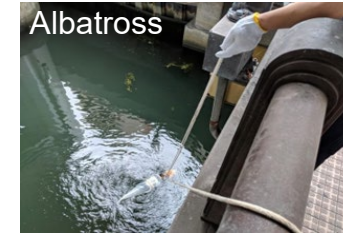


Microplastic

- Albatross
- Dynamic manta trawl
- Neuston net
- Saturna
- Plankton net
- FTIR

## Assessments

- Transect survey for river
- Microplastic in river
- Microplastic in fish



Albatross



Saturna



Neuston net



Transect survey



Priority management

Degradation



Macro plastic

Microplastic

- Massive amounts of single-use plastics
- Plastic production is still increasing
- Manual and tools collection

- Difficult to collect
- Require analysis method
- Require skill



- Outreach, sharing & exchange of harmonized approach, methodologies, and tools for plastic data collection through regional knowledge centers like

- Regional Knowledge Centre for Marine Plastic Debris RKC-MPD ERIA



- Enhancing plastic data collection capacity of the countries through **technical skill enhancement training**, transfer of know-how and technical infrastructure/tools
- Regional research and data collection effort to focus on microplastics
- Mention the assumption in data collection and analysis transparently. Consider local cultures, practices and socio-economic contexts surrounding plastic production, consumption and waste generation & management systems including plastic waste handling by informal sector into calculation



# Thank You!

## Harmonized System Codes Used to Collect Data under Production Sub-Categories

Data	Data Source	HS codes
<b>Imports and exports:</b> Virgin plastics	<b>International:</b> International Monetary Fund, World Bank  <b>National:</b> Country Statistics	HS390110 (LDPE) HS390120 (HDPE) HS390210 (PP) HS390319/390311 (PS) HS390330 (ABS) HS390760 (PET/PETE) HS390740 (PC) HS390730 (Epoxy resins) HS390690 (Acrylic) HS390610 (PMMA) HS390410/390422/390421 (PVC)

ABS = acrylonitrile butadiene styrene, HDPE = high-density polyethylene, HS = Harmonized System, LDPE = low-density polyethylene, PC = polycarbonate, PET = polyethylene terephthalate, PMMA = polymethyl methacrylate, PP = polypropylene, PS = polystyrene, PVC = polyvinyl chloride. Note: HS 39 comprises plastics and articles thereof.

## Current State of Data on Waste Management

Waste Management	Ability to Collect	Data Availability
OECD countries, Japan, Korea, Singapore	Yes	No
Indonesia, Malaysia, Philippines, Thailand, and Viet Nam	Partly	Partly
Brunei Darussalam, Cambodia, Lao PDR, and Myanmar	In development	In development

Lao PDR = Lao People's Democratic Republic, OECD = Organization for Economic Co-operation and Development.