10th Regional 3R and Circular Economy Forum in Asia and the Pacific
Webinar III: 3R and circular economy as the basis for moving towards zero plastic waste in coastal and marine environment

Plastic Waste Management In Asia and the Pacific – Issues, Solutions and Case Studies

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Laws and Plans for 3R and Circular Economy in Asia (1)

	Laws, Plan	Year	Measures
Japan	Act on the Promotion of Effective Utilization of Recycled Resources	1992	Revised to Act for Promotion of Effective Use of Resources (2001)
	Act on Containers and Packaging Recycling.	1995	EPR is applied. Enforced in 1997
	Basic Act on Establishing a Sound Material-Cycle Society	2000	Basic act: 3R (Reduce, Reuse and Recycle) is emphasized.
		2020	Ban on free supply of shopping bags
South Korea	Act on Resource Saving and Recycling Promotion	1992	Ban on free supply of single-use products.
	(Major revision)	2000	EPR is applied to plastic packages.
China	Circular Economy Promotion Law	2008	Basic law.
	Notice on solidly advancing the treatment of plastic pollution	2020	Strengthen the supervision and inspection of the prohibition on the production and sale of plastic products.

Laws and Plans for 3R and Circular Economy in Asia (2)

	Law, Plan, System	Year	Measures
Philippines	Ecological Solid Waste Management Act	2001	Establishing Material Recycling Facility in barangay, Labeling program
Malaysia	Roadmap Towards Zero Single-Use Plastics 2018-2030	2018	Schedule of banning single-use plastics, and of using biodegradable plastics.
Thailand	Roadmap on Plastic Waste Management 2018-2030	2019	Ban on plastic cap seals, oxo-degradable plastic products, and microbeads.
Singapore	Resource Sustainability Act	2019	Applying EPR on packaging and container and e-waste, and other measures.
Indonesia	Roadmap for Waste Reduction by Producers	2019	Require producers and others to reduce packaging and container
Vietnam	National Action Plan on Marine Plastic Debris Management through 2030	2019	Removal of single-use plastic products in coastal tourist destinations, accommodation and services, and others.
India	Municipal Solid Waste (Maintenance & Handling) Rules	2000, 2016	Require some industries to use compost and RDF.
	Plastic Waste (Management and Handling Rules	2011, 2016, 2018	EPR is applied. Non recyclable multi-layer package should be phased out.

Measures against Marine Plastic Debris

	Immediate Action	Mid-term and Long-term Action
Reduce (including reuse)	Restrict use of single-use plastics, to which alternatives (including reusables)are available.	Develop alternatives, including reusables, and enhance capacity of supply of alternatives.
Recycling	Design for Recycling. Increase collection of recyclable plastic wastes. Increase the capacity of recycling industry. Increase recycling contents in product. Invest in reducing transportation cost of recyclable plastics. Apply Extended Producer Responsibility.	Develop recycling technology for plastic waste, which is difficult to be recycled (or develop alternatives).
Waste Management	Prevent littering. Expanding waste collection to medium, small cities and rural area (including waste reception facility at ports) and proper recycling and disposal. Collecting marine debris from river, port, and beaches	Collecting marine debris from the ocean.
Reduce leakage of plastics, which may not be covered in waste management.	Prohibit use of Microbeads. Require industries to prevent leakage of resin pellet, from factory or during transportation. Require to collect worn-out artificial turf and slow-release fertilizer at the source.	Invest in centralized and decentralized wastewater treatment to prevent discharge of fibers of washing clothes.

The fate of all Indonesia's plastic waste, in each archetype (million tonnes per year, 2017)

	Mega Cities	Medium and Small Cites	Rural	Remote	Total
Total Generation	1.6Mt	1.8Mt	2.5Mt	0.9Mt	6.8Mt
Leakage into Sea, Lakes and Rivers	4%	8%	12%	15%	10%
Dumping on Land	1%	3%	8%	8%	5%
Open Burning	21%	45%	61%	64%	48%
Official dumpsites	3%	3%	14%	15%	9%
Managed Disposal	51%	29%	0%	0%	20%
Recycling	20%	12%	5 %	0%	9%

46.7% of leakage is from Rural Area. 69% of leakages is from Rural area and Medium and Small Cites. Recycling rate in rural area is also lower than cities.

Source: World Economic Forum (2020) *Radically Reducing Plastic Pollution in Indonesia: A Multistakeholder Action Plan: National Plastic Action Partnership.*

How to expand waste collection, proper disposal and recycling in small cities and rural area?

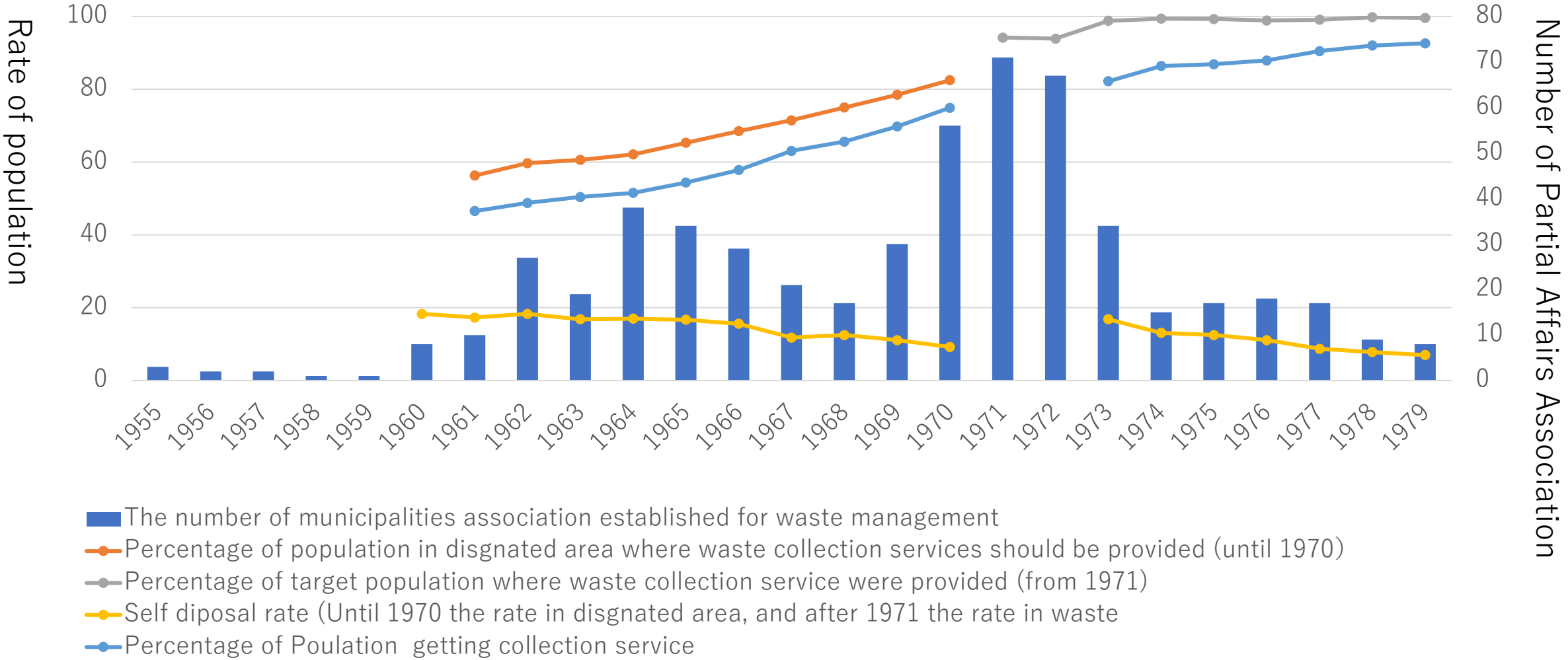
- Rural area and Medium/Small cities are regarded as major source of leakage of plastics to the ocean. Recycling rate in rural and remote is also lower than cities.
- To reduce the leakage of plastic waste to the ocean, waste collection, recycling and proper disposal should be expanded to medium and small cities, and rural area.
- There are economies of scale in proper treatment and disposal facilities, such as waste-to-energy (WtE) plant and sanitary landfill.
  - Unit construction cost of WtE and sanitary landfill decrease, as the capacity increase.
- To utilize economies of scale in waste management, some Asian municipalities started to formulate regional scheme on or inter-municipal cooperation on waste management.
  - Extra budget from saving investment cost of treatment and disposal facility can be allocated to collect plastic waste from broader area and to recycle plastic waste.
- To increase recycling rate in rural and remote area, reducing transportation cost for recyclable waste is important.

Expand waste collection services to Medium, Small cities and Rural Area

Japanese Experiences

- The Waste Cleaning Act was enacted in 1900, under pandemic of Plague. The area where municipality should conduct waste management was only cities.
- The Public Cleaning Act was enacted in 1954.
  - Waste management services should be provided in cities and other designated area.
  - The governor of prefecture can require municipalities of town or villages, to conduct waste management.
  - ➢In 1961, in terms of population, share of designated area is 56.3%, while 18.3% of them did not receive waste collection services.
- Act on Emergency Measures Concerning the Improvement of Living Environment Facilities, in 1963.
- Waste Management and Public Cleansing Act was enacted in 1970
  - Designated area for waste management was deleted in new Act. All municipalities, cities, towns and villages should conduct proper waste management.
  - Many cities, towns and villages formulated Partial Affairs Association to treat and dispose waste jointly. Association can save investment cost of waste treatment and disposal facility, because of economies of scale.

Number of Establishment of Partial Affairs Association concerning Waste Management in Japan

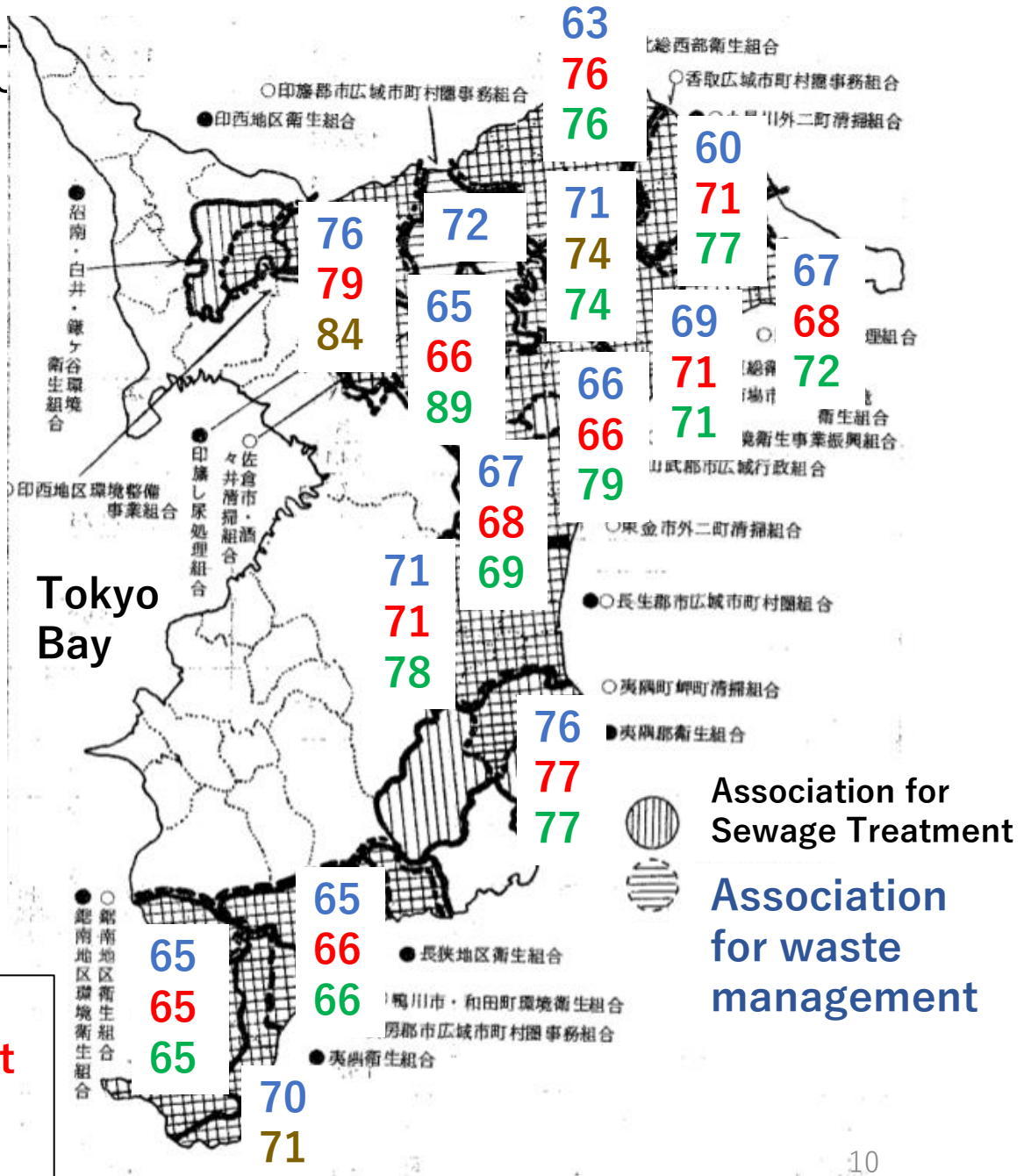


Regional Waste Management in Chiba Prefecture in 1960s and 1970s.

Number of local government associations with waste management

	1960 -64	1965 -69	1970 -74	1975 -79
No. of Association	0	6	7	2

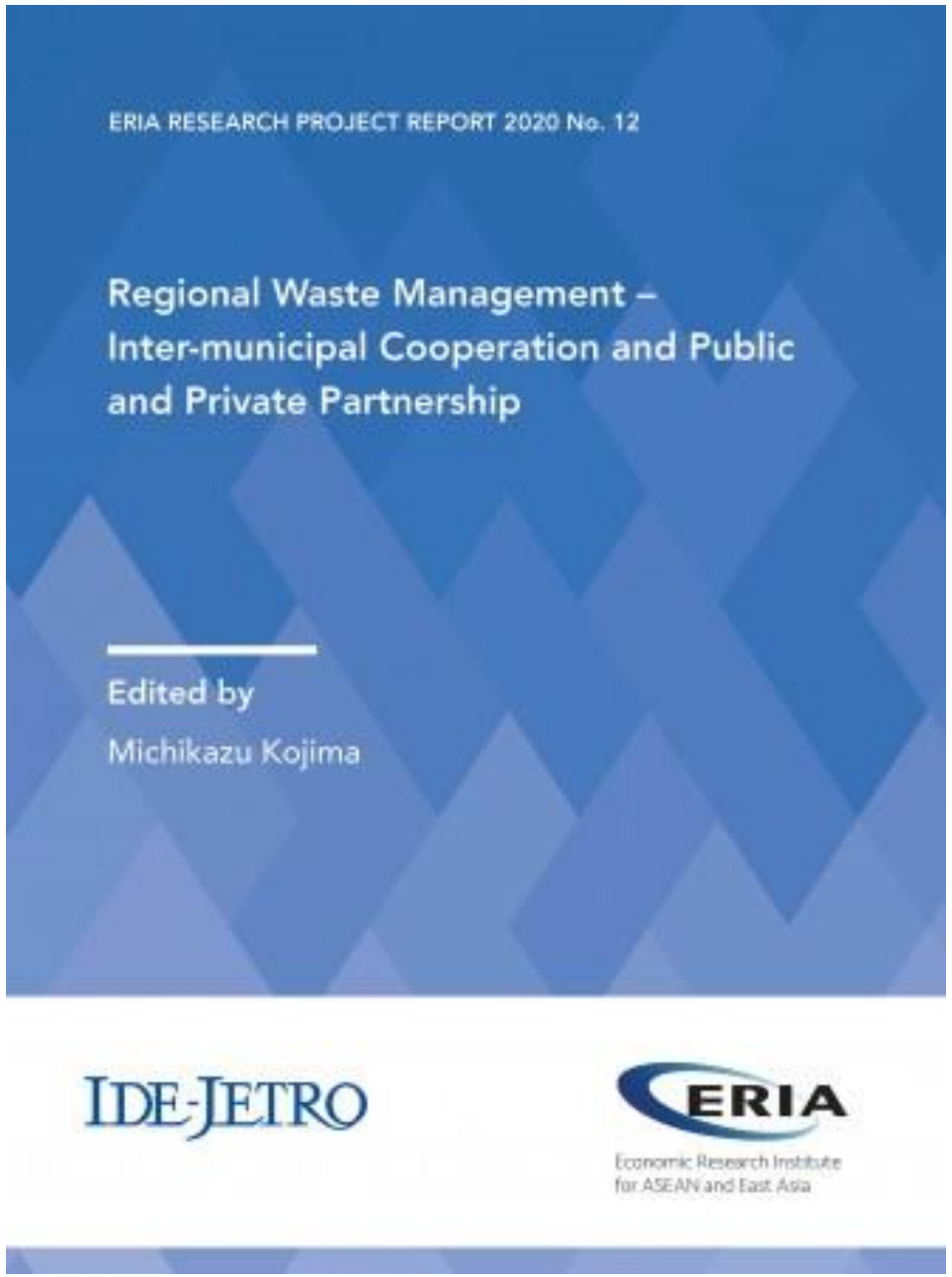
Number of municipalities in an association: 2-11.
Number of Partial Affairs Association consisting of cities and town/villages: 10.
Number of Partial Affairs Association consisting of town/villages: 5.



Year of Establishment of Association
Year of Operation of Incineration Plant
Year of Treating Bulky Waste
Year of Operation of Landfill

Some Good Practices of Regional Waste Management in Asia

		Example	Explanation
National Policy		Japan: Partial Affairs Association. Thailand: Clustering Policy on Waste Management. India: Issued guideline on regional waste management.	Legal basis and incentives are provided
Inter-municipal cooperation	Regional Government Scheme	Waste-To-Energy plant planed in West Jawa, Indonesia. Sanitary Landfill in South Cotabato, in the Philippines.	Regional government make agreement with local governments in the region and accept waste from them.
	Leading Municipality Scheme	Waste to Energy Plant in Phuket, Thailand and Kitakyushu city in Japan.	A municipality hosting waste treatment or disposal facility make agreement with and receive waste from other municipalities.
	Municipalities' Association Scheme	Partial Affairs Association in Japan	Local governments formulate association to treat and/or dispose waste jointly.
	Private Sector Leading Scheme	Some private landfills accepting ashes from Waste-to-Energy plants in Japan. Some private landfills and RDF Plants in Thailand.	Private sector operates waste treatment and disposal facility which accept waste from multiple local government.



- Ch.1 Regional Waste Management in Asia
- Ch.2 Inter-Municipal Cooperation and Regional Waste Management in Japan
- Ch.3 Inter-Municipal Cooperation on Solid Waste Management in Japan: Its Challenges and Implications for ASEAN Countries
- Ch.4 Cost Efficiency of Regional Waste Management and Contracting Out to Private Companies
- Ch.5 Promoting Local Collaboration on Waste Management: Lessons from Selected Cases in the Philippines
- Ch.6 Internal and External Factors in the Development of Regional Waste Cooperation in the Greater Bandung Region
- Ch.7 The Effect of Local Government Separation on Public Service Provision in Indonesia: A Case of Garbage Pickup Services in Urban Areas
- Ch.8 Clustering and Public–Private Partnerships: The Tools of Municipal Solid Waste Management Reformation in Thailand

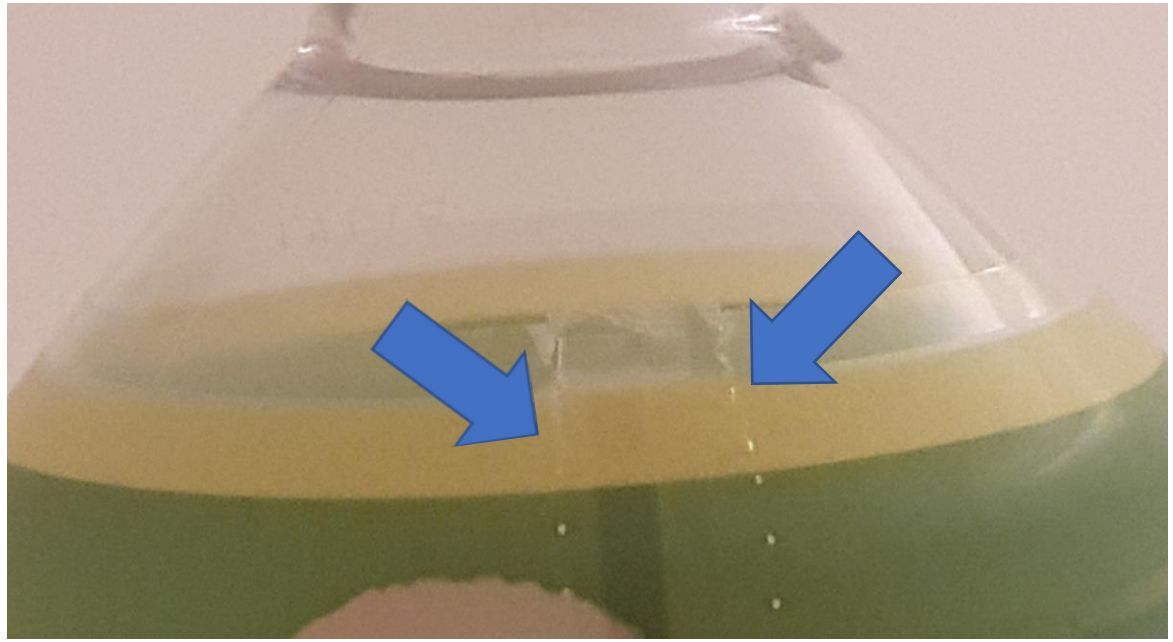
Downloadable from : https://rkcmpd-eria.org/publication/18

Design for Recycling and Reducing Transportation Cost for Plastic Recycling

Design for Recycling

- Design for recycling can raise the price of recyclable plastic waste. If it is valuable, it become easier to cover transportation cost.
- A best practice of design for recycling is the voluntary standard for the design of PET bottles, developed by Japan's Council for PET Bottle Recycling.
  - Plastics which gravity are less than 1 should be used for caps and label, such as PP and PE, in order to sort out caps and label from PET easily.
  - Prohibit coloring PET, because waste PET with color has limited demand of recycling.
  - It is also recommended to have perforation on the labeling.

This voluntary standard in Japan was formulated after the enactment of the Container and Packaging Recycling Law, which applies extended producer responsibility (EPR) to manufacturers and importers.



Perforation on the labeling of PET bottle.

To Reducing Transportation Cost of Recyclable Waste

Shredding machine. Near Vientiane, Laos, March 2013.

- To reduce the transportation cost, it is important to invest in shredding, baling and compressing machine.

Compressing Expanded Polystyrene. Volume can be reduced to 1/50th of original volume. Kunitachi City, Tokyo, Japan. July, 2017.

Moana Taka Partnership

- China Navigation(CNCo)and Secretariat of the Pacific Regional Environment Programme (SPREP) signed a Memorandum of Understanding (MOU) in March 2018, on Moana Taka Partnership.
  - Under this project, CNCo provides both containers and ocean freight carriage, on a free of charge basis, for certain type of recyclable waste from the 26 Pacific Island Countries and Territories (PICT) to be sustainably treated and recycled in pre-selected and approved suitable and competent facilities in Asia Pacific.
  - In 2018, 14,140 kg of plastic clippings were shipped from Suva to Brisbane, and 24,274 kg of heavy steel scrap metal were shipped from Apia to Brisbane.
- The shipping company may not bear high marginal cost for transporting recyclable waste, because there may be vacant containers from Pacific islands to other regions.

Thank you for your attention.
Please also visit our website to share the good practices in ASEAN +3 countries.

Website: https://rkcmpd-eria.org/