SIDS (Pacific Island Countries) Capacity Building Training Programme on the Implementation for the Jaipur Declaration on 3R and Circular Economy (2025-2045)
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Towards Zero Plastic Waste: Policy, Innovation, and Community Action

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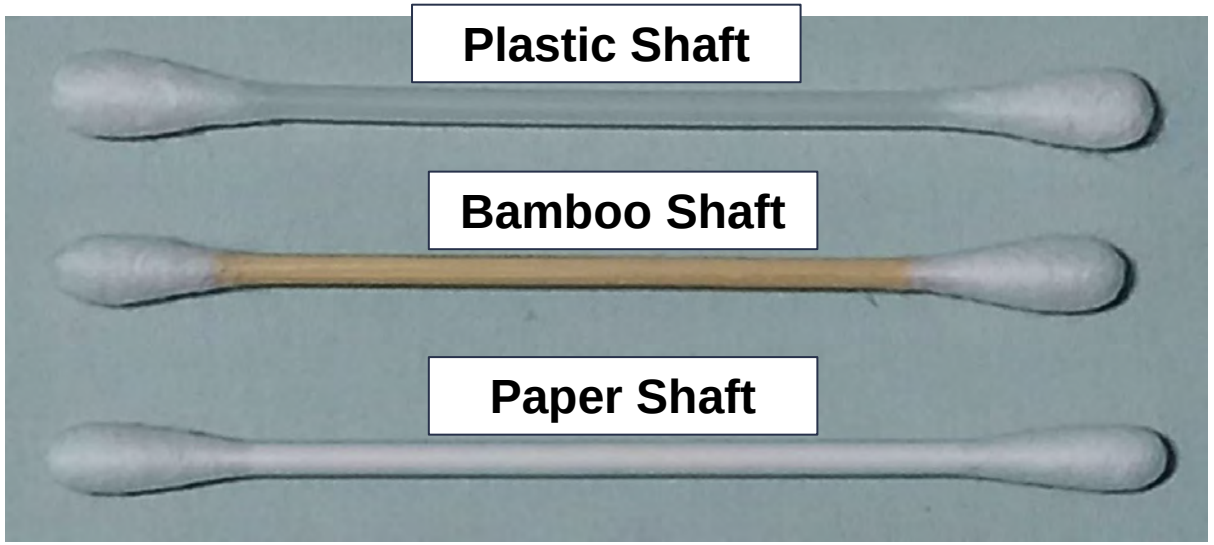
Various Measures against Plastic Pollution

- Use of Alternative Materials (Reduce)
  - Woods
  - Reuse,
  - Biodgeradable Plastics
- Recycling
  - Market Based Recycling
  - Extended Producer Responsibility
- Waste Management
  - Expanding Collection Area and proper Waste Management
  - RDF

Use of Alternative Material

Alternative Materials(1)

- There are various Single Use Plastics
- Plastics are used various occasions, not only inside of household or offices, but also in the outer space.
- Based on regulation or voluntary initiative, some materials including biodegradable plastics and bio-base material, can substitute to conventional plastics.



- Bamboo shaft is made in China produced by CITICITY®.
- Paper shaft is very popular in Japan.

Alternative Material (2)

Wood based cutleries served by Singapore Airline, August 2022, photo by M. Kojima.

Refill Shop in Bangkok Thailand, 2022, photo by M. Kojima

Sugar cane stirrer and Paper Straw, Indonesia, 2019, Photo by M. Kojima.

Use of Biodegradable

- Biodegradable plastics should be used for products in outer space with short time.
  - Plastics used in Agriculture and Fishery Sector
    - Capsule of slow-release fertilizer
    - Multi film for agriculture (warming soil, keeping water in soil, preventing leakage of fertilizer, weed suppression)
    - Film covering Banana(to keep green color, before sending market)
    - Film covering Palm
    - Plastic bait

Photo by Kojima, in the Philippines.

Behavioral Change of SUPs

- Some economists have tried to find the trigger to change behavior on reducing use of single use plastics. There are many papers based on Experimental Economics.
- Gbadebo Collins Adeyanju et al. (2021) review 17 peer-reviewed articles, between 2000 and 2019.
  - Regulation based solely on the thickness of plastic bags does not reduce plastic bags consumption.
  - Imposing higher taxes and levies on consumers, significantly reduce plastic bag consumption.
  - Attitude, perception and behavior change toward bio-degradable products or climate-friendly behavior can be significantly influenced by public policy or regulations.
- Dwayne Appleby, Alice Marie Yamabe-Ledoux, Atsushi Watabe, Arisman, Pasicha Chaikaew, Nuta Supakata, Brida Lea Diola, Noriza Tibon Sadie, and Diep Dinh Phong (2024) ***Breaking the Plastic Habit****: A Guidance Note and Practical Toolkit Lessons from Single-Use Plastic Behaviour Change Interventions in Indonesia, the Philippines, Thailand, and Viet Nam*
  - *https://alpha.rkcmpd-eria.org/reports-and-publications/breaking-the-plastic-habit-a-guidance-note-and-practical-toolkit*
  - Behavioral insight interventions, alongside traditional policy measures, offer promising solution to nudge consumers away from single-use plastic consumption.

Recycling

Recyclable Plastics

Not all of plastics are recycled. Basically, thermoplastics are recyclable, while thermosetting plastics are not recyclable.

Different type of plastics have different melting point. To recycle plastics, it is better to recycle plastics having same melting point.

Otherwise, mixed of plastics may broken easily.

Plastic	Melting Temperature	Specific Gravity
PVC	85~210	1.35-1.45
PET	260	1.4
PC	150	1.2
PE	95~130	0.91~0.92
HDPE	120~140	0.94~0.97
PP	160	0.9
ABS	100~130	1.04
PA	220	1.03~1.13

Source:
https://www.fujikouki.jp/technology/cutting/material/

Design for Recycling

- It is important to have design for recycling, to separate different types of plastics.
- If melting points are different, the durability of plastics made by different plastics might be low.

- To separate plastics, it is better to use different plastics with same specific gravity, in plastic product, packaging and container.

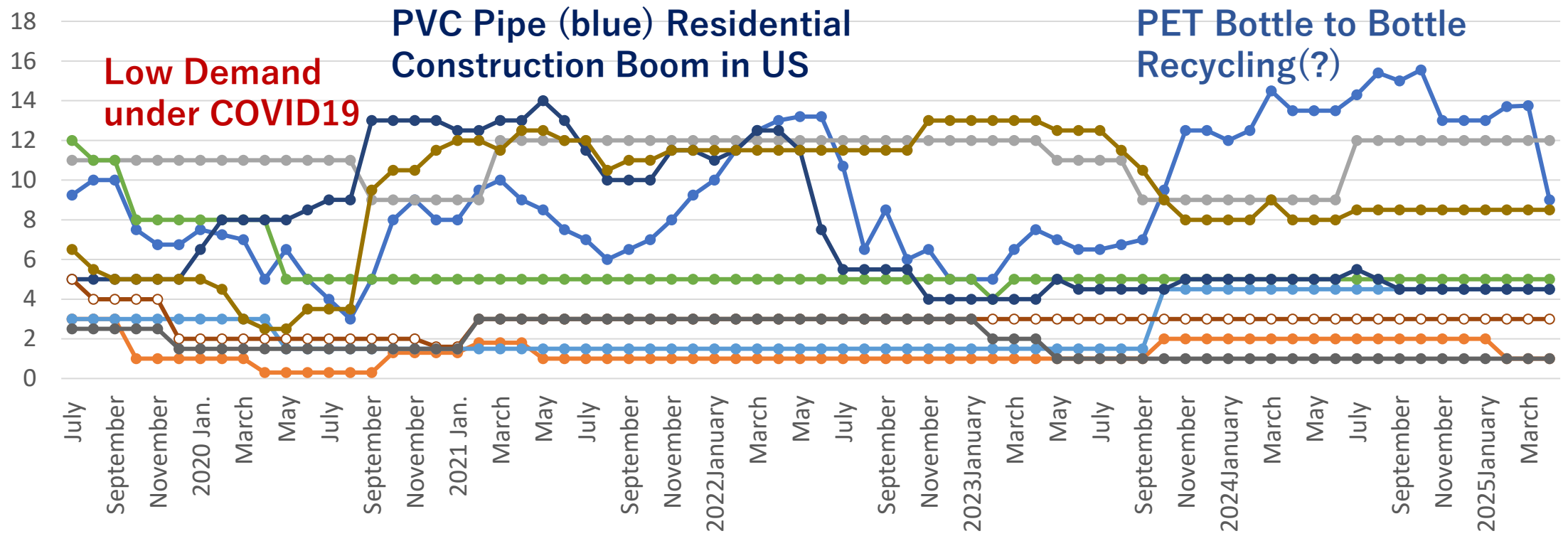
Waste Plastics	Baht
PP.TD10,20	0.00
PS(Large piece)	0.50
Fertilizer Sack Scrap – dry & clean	0.70
No.2 PET Bottle(Green)	1.00
Black Plastic	1.00
Clear PS Plastic-CD case	1.00
Soft waste hose	2.50
EPS Foam	4.50
(HDPE White) Drinking Waste Plastic Bottle	5.00
Plastic Acrylic Billboard	5.00
(HDPE White) Drinking Water Tank 200 liter	5.50
Plastic DVD	6.00
PVC Boots	8.50
No.1 PET Bottle(Clear)	14.00
Pepsi, Miranda, Aquaves(bottle)	15.00

Buying Price on March 8, 2025, by Wongpanit, Thailand.

Price of Waste Plastics

- Depending on type of plastics, the price of plastic waste varies.
- In addition, price of plastic waste are fluctuated, due to the oil prices, the demand and supply of specific plastics, technical difficulty of plastics, development technology and others.
- Wongpanit is a franchised junk-shop chain, starting from Thailand. The franchised shops are diffused to not only Thailand but also Laos, Cambodia and United States.

Buying Price by Wongpanit (a junk shop chain in Thailand)



Community Action

Good Practices in Rural Area

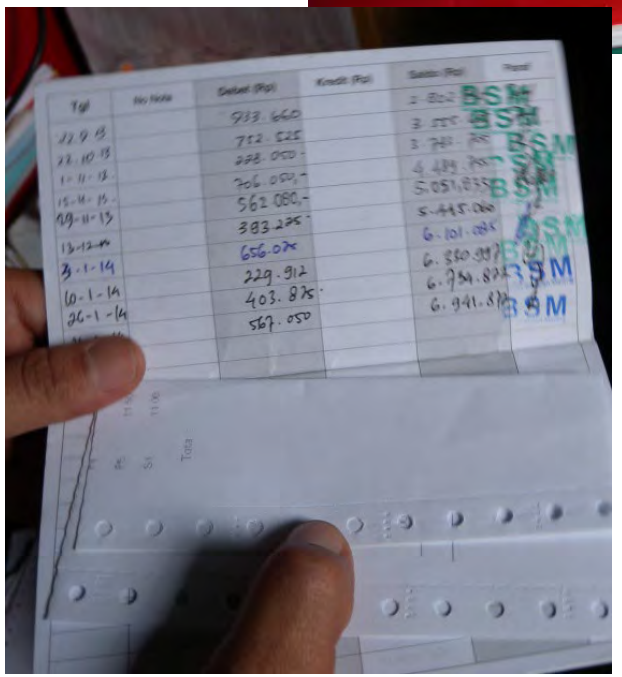
Section 32, Establishment of LGU Materials Recovery Facility, of Ecological Solid Waste Management Act, Philippines

There shall be established a Materials Recovery Facility (MRF) in every barangay or cluster of barangays. The facility shall be established in a barangay owned or leased land or any suitable open space to be determined by the barangay. For this purpose, the barangay or cluster of barangays shall allocate a certain parcel of land for the MRF. The determination of site and actual establishment of the facility shall likewise be subject to the guidelines and criteria set pursuant to this Act. The MRF shall receive mixed waste for final sorting, segregation, composting, and recycling. The resulting residual wastes shall be transferred to a long-term storage or disposal facility or sanitary landfill.

Material Recovery Facility, Guimaras Island, Philippines. They produce chairs for school children. Photo by M. Kojima, March 2024.

Bank Sampah （Waste Bank） in Indonesia

- People bring some waste to Bank Sampah (waste bank) to get money or to deposit.
  - The buying price is higher, if the money is deposit to Bank Sampah.



↑When I visited Bank Sampah Malang , the bank bought about 70 items, including plastics, paper and others.
←Saving passbook. Buying price by the Bank Sampah is higher, if customer put deposit. Instead of cash. March 2014, Photo by M. Kojima

Increase Demand of Recycled Plastics

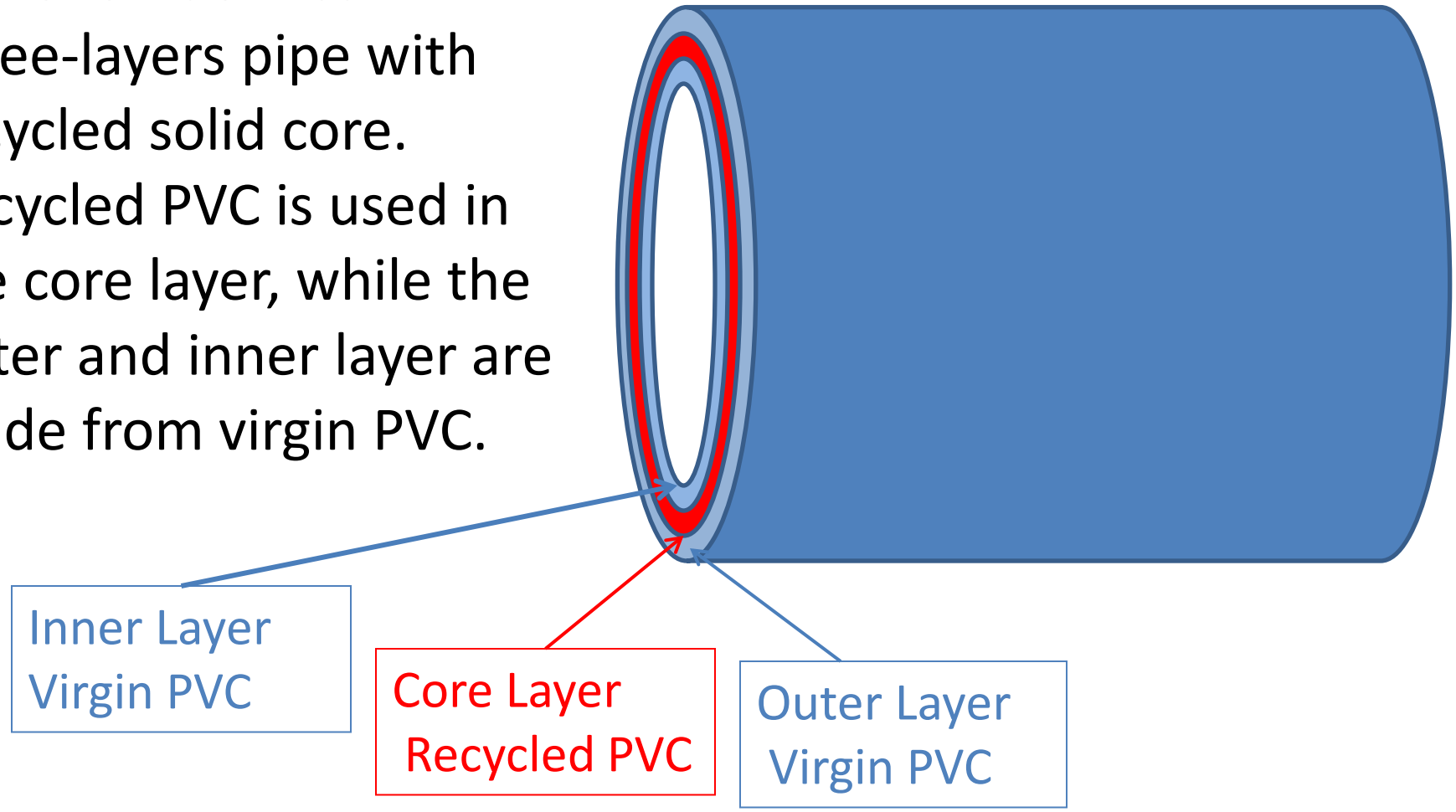
Ensuring the demand of recycled products

- It is also important to ensure that demand exist for recycled products. Some recycled products may not satisfy the level of quality desired by customers or defined in conventional industrial standards for products made from virgin materials.
- To ensure an adequate level of quality for recycled products, and to reduce the transaction cost between the suppliers and buyers. Industrial standard for recycled products should be developed.

JIS Code	Title of Japan Industrial Standard
JIS A5731	Recycled plastics inspection chambers and covers for rainwater
JIS A5741	Products of wood-plastic recycled composite
JIS A5742	Products of wood-plastic recycled composite – assembled decks
JIS K6930	Reclaimed granulate moulding materials of agricultural polyvinyl chloride film
JIS K6931	Reclaimed plastics bars, rods, plates, and piles
JIS K6932	Recycled plastics stakes
JIS A9401	Recycled plastics medial strip block
JIS A9402	Recycled plastics buffer for parking
JIS K9797	Un-plasticised poly(vinyl chloride)(PVC-U) three-layer pipes with recycled solid core
JIS K9798	Un-plasticised poly(vinyl chloride)(PVC-U) three-layer pipes with recycled foamed core

Unplasticized poly (vinyl chloride)(PVC-U) three-layers pipe with recycled core

JIS K9797 defines PVC three-layers pipe with recycled solid core. Recycled PVC is used in the core layer, while the outer and inner layer are made from virgin PVC.



Industrial Standard in Malaysia Industrial Standard Related to Plastics

- SIRIM has developed various industrial standards. Energy and Environment Centre in SIRIM developing Eoc-labeling program
  - SIRM CFP 023:2023, Product category rules – Carbon footprint – Plastic intermediate product
  - SIRIM CFP 020:2021, Product category rules – Carbon footprint – Biobased plastic product

- SIRIM ECO 001:2018, Eco-labelling criteria – Biodegradable and compostable plastic and bioplastic.
  - Biodegradable: 90% degradation withing 6 months
  - Compostable：Achieving standard of biodegradable, without hazardous residue.
- SIRIM ECO 009:2019, Eco-labelling criteria – Biodegradable and compostable biomass products
- SIRIM ECO 018:2025, Eco-labelling criteria - Recycled Plastic Products
- SIRIM ECO 063:29017, Eco-labelling criteria – Biobased Plastic Intermediates and products.
- SIRIM ECO:054. 2016, Eco-labelling criteria - Plastic piping system
- SIRIM ECO 098:2023, Eco-labeling criteria - Degradation of polyolefin plastic in an open-air terrestrial environment

Industrial Standard for Recycled Goods

- Indonesia
  - SNI 7199:2016:
    - Ecolabeling Criteria for the Categories of Compostable Products, Product Packaging and Bioplastic Containers.
  - SNI 8424:2017:
    - Certification for Recycled PET
- India
  - IS 14534 : 2023: Plastics-Recovery and Recycling of Plastics Waste-Guidelines
  - IS 14535: 1998: Designation of recycled plastics use in manufacturing
  - IS 17899T: 2021: Assessment of the biodegradability of plastics in different conditions.
  - IS 16591 (Part 1): 2016/ISO 18263-1: 2015: Designation system and basis for specifications for mixtures of polypropylene (PP) and polyethylene (PE) recyclate