

The 4th WGIA: 14-15 Feb., 2007@Jakarta, Indonesia

Report on WG: Waste

Chair: Dr. Sirintornthep Towprayoon

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Participants: Mr. HB. Henky Sutanto, Ms. Upik Sitti Aslia,
Mr. Hiroshi Fujita, Mr. Khamphone Keodalavong,
Mr. Ne Winn, Ms. Raquel Ferraz Villanueva
and Mr. Kiyoto Tanabe

7 countries/organization and 9 participants

Theme one: Wastewater treatment and discharge

Presentations

- Methodology in [IPCC's Guidelines](#)
by Mr. Kiyoto Tanabe
- Country Report: [Philippines](#)
by Ms. Raquel Ferraz Villanueva
- Country Report: [Lao PDR](#)
by Mr. Khamphone Keodalavong
- Country Report: [Indonesia](#)
by Mr. HB. Henky Sutanto and Ms. Upik Sitti Aslia
- Country Report: [Myanmar](#)
by Mr. Ne Winn
- Country Report: [Thailand](#)
by Dr. Sirintornthep Towprayoon
- Country Reports: [Japan](#)
by Mr. Hiroshi Fujita

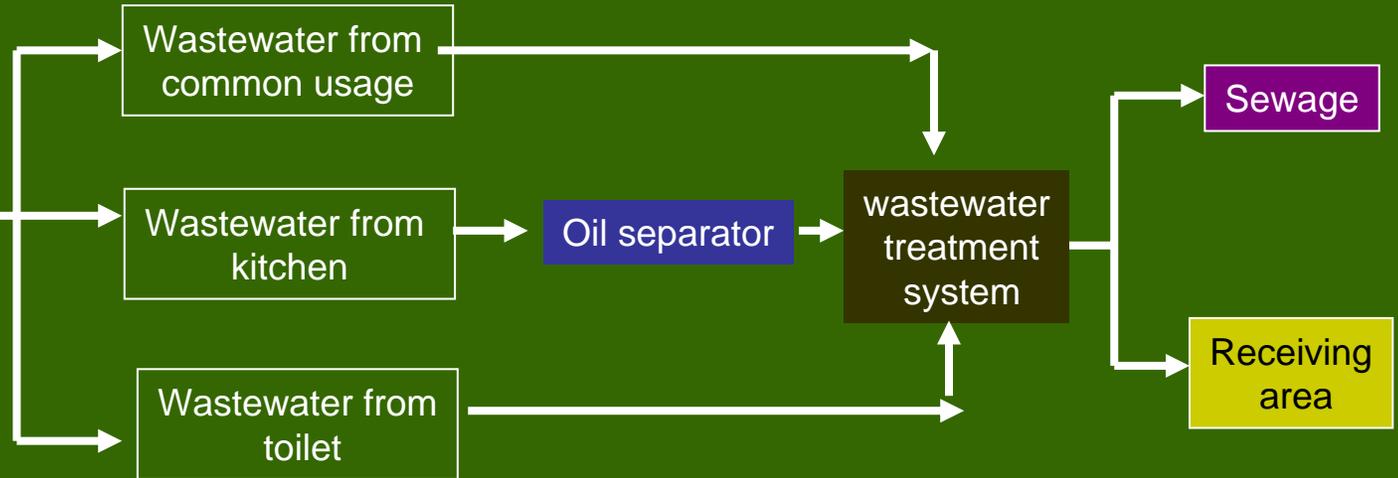
Discussion (1): Comparison of wastewater flow in Asia

- **Domestic WW flow**
 - **There are 4 types of flow in Asia**
 - Untreated to river/sea
 - Septic tank to river/sea
 - Septic tank via sewer collection to river/sea
 - Septic tank through sewer collection to central treatment plant and discharging to river/sea
 - **These flows are depend on type of septic tank**
 - The flowchart in 2006 guideline is not enough for Asian Countries.

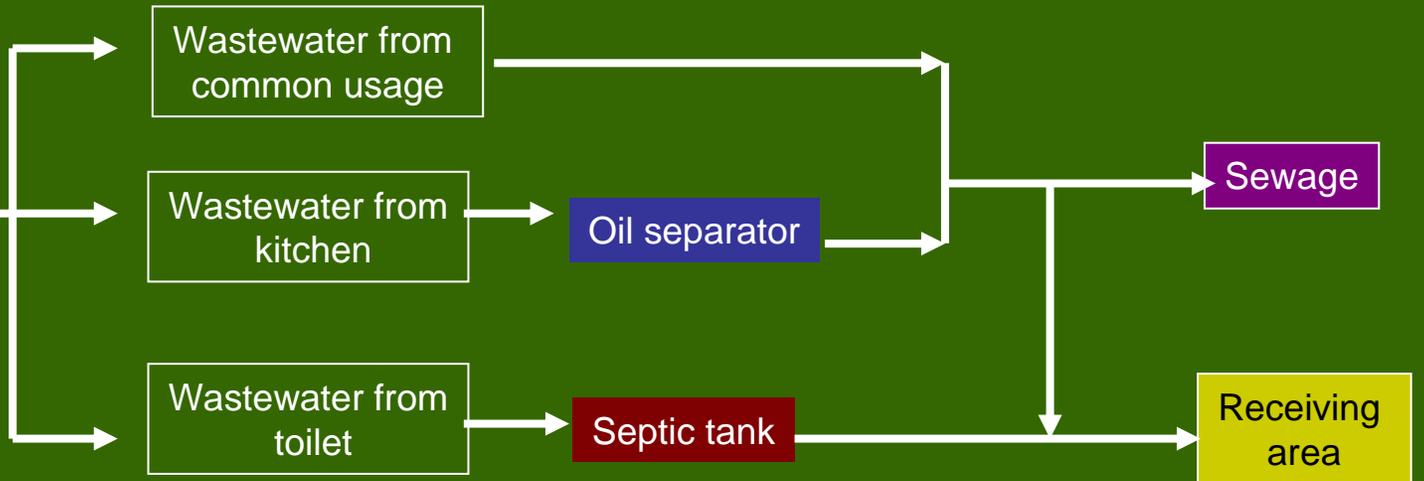
On site Wastewater Treatment

Thailand

New household and building

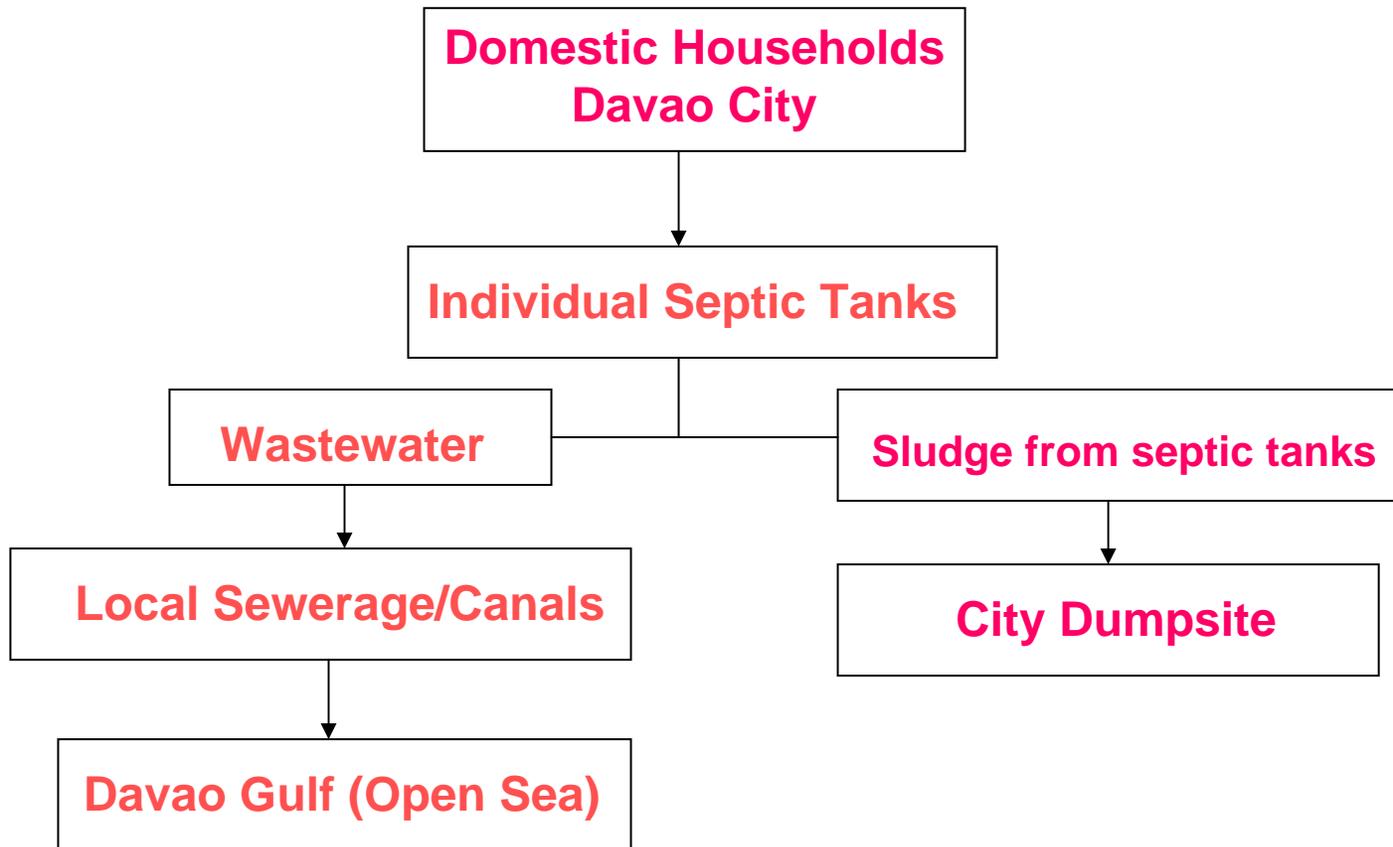


Old household and building



WASTEWATER FLOW FOR DOMESTIC WASTEWATER

Philippines



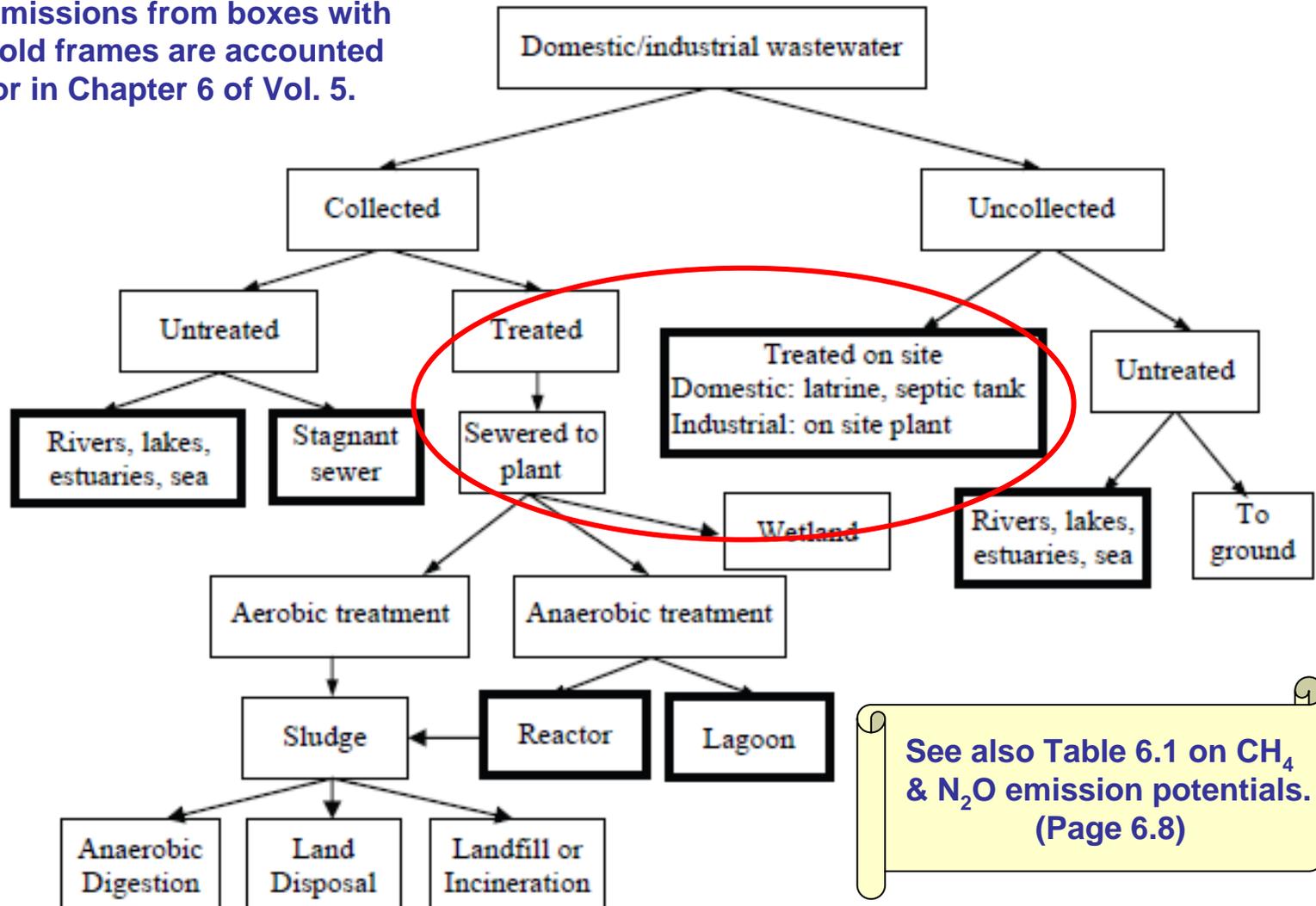
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Wastewater treatment system and discharge pathways

IPCC

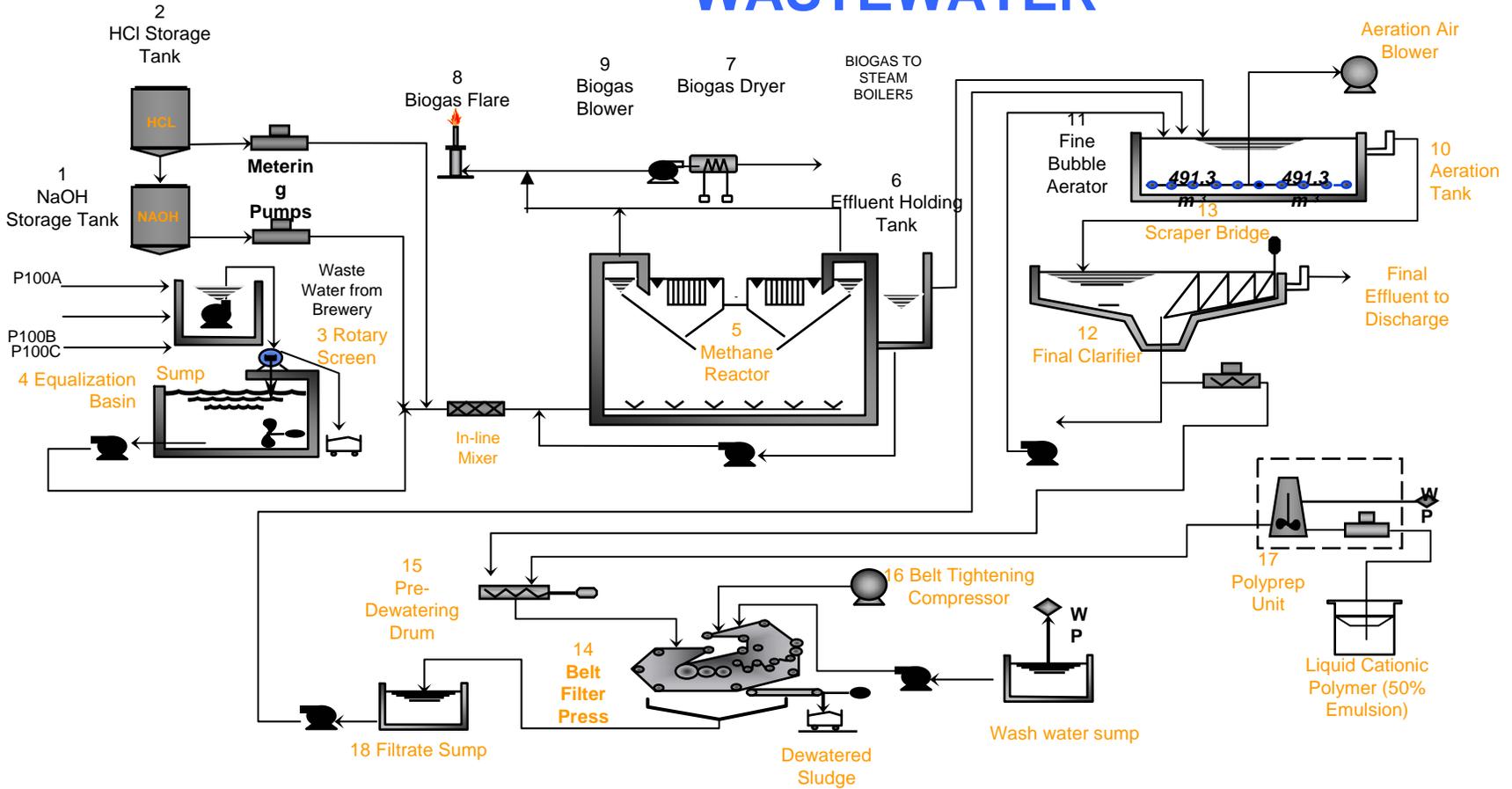
Emissions from boxes with bold frames are accounted for in Chapter 6 of Vol. 5.



Discussion (2): Comparision of wastewater flow in Asia

- **Industrial WW flow**
 - **should depend on type of industry**
 - **Uncollected & untreated: small factory**
 - **Organics is mainly contained in WW from Food, Pulp and paper, Chemical, Textile... industries**
 - **Make attention to fate of sludge.**

WASTEWATER FLOW FOR INDUSTRIAL WASTEWATER

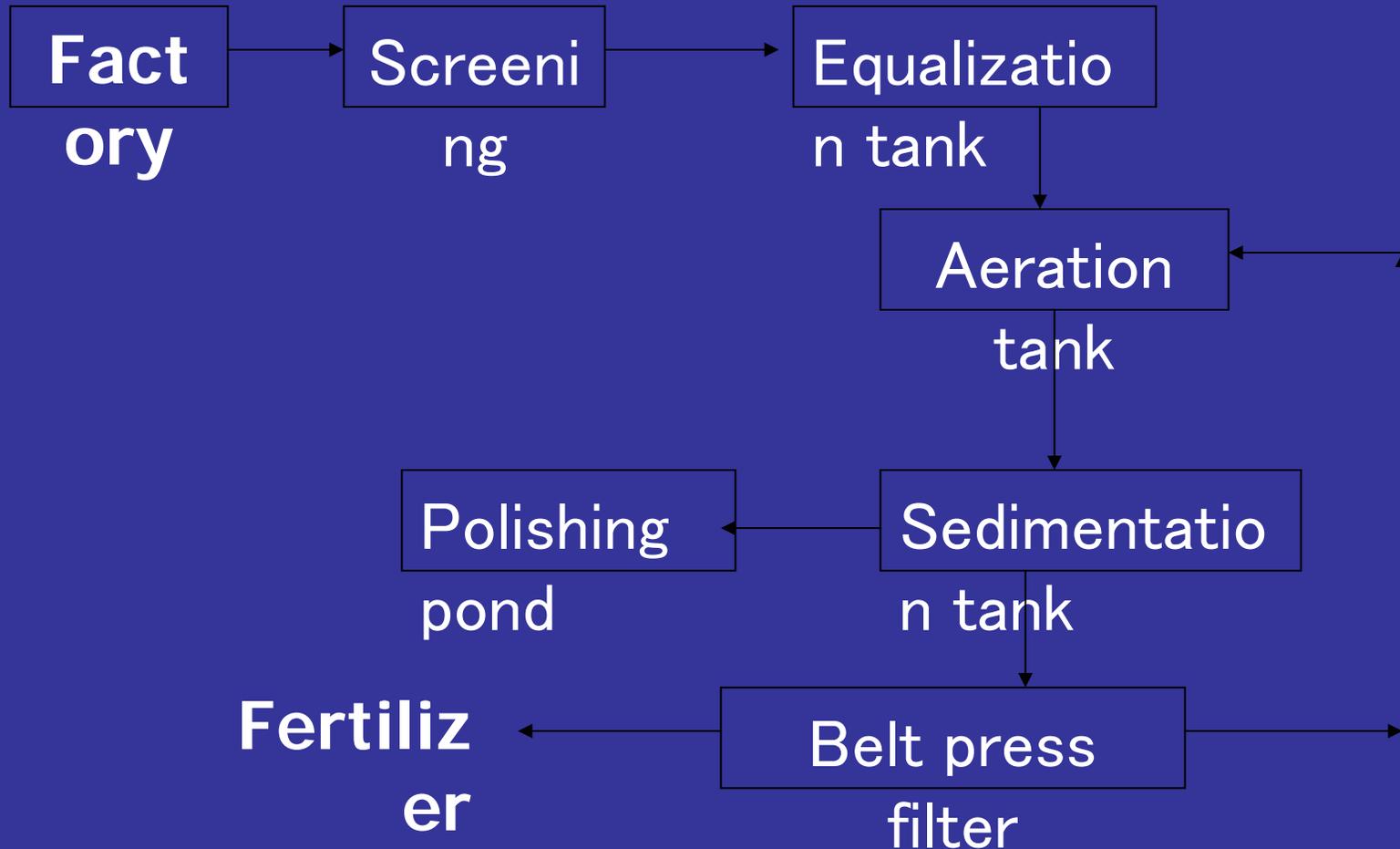


BEER MANUFACTURING PLANT

Philippines

Industrial Wastewater Flow

Lao PDR



Discussion (3): Other Issues

- **Mixing of Domestic and Industrial WW**
 - is not common in Asian Countries.
- **EF**
 - MCF: less information in Asian countries.
 - We can use 2006 guideline data if they fit to Asian countries.

Theme two: Solid waste disposal on land

Presentations

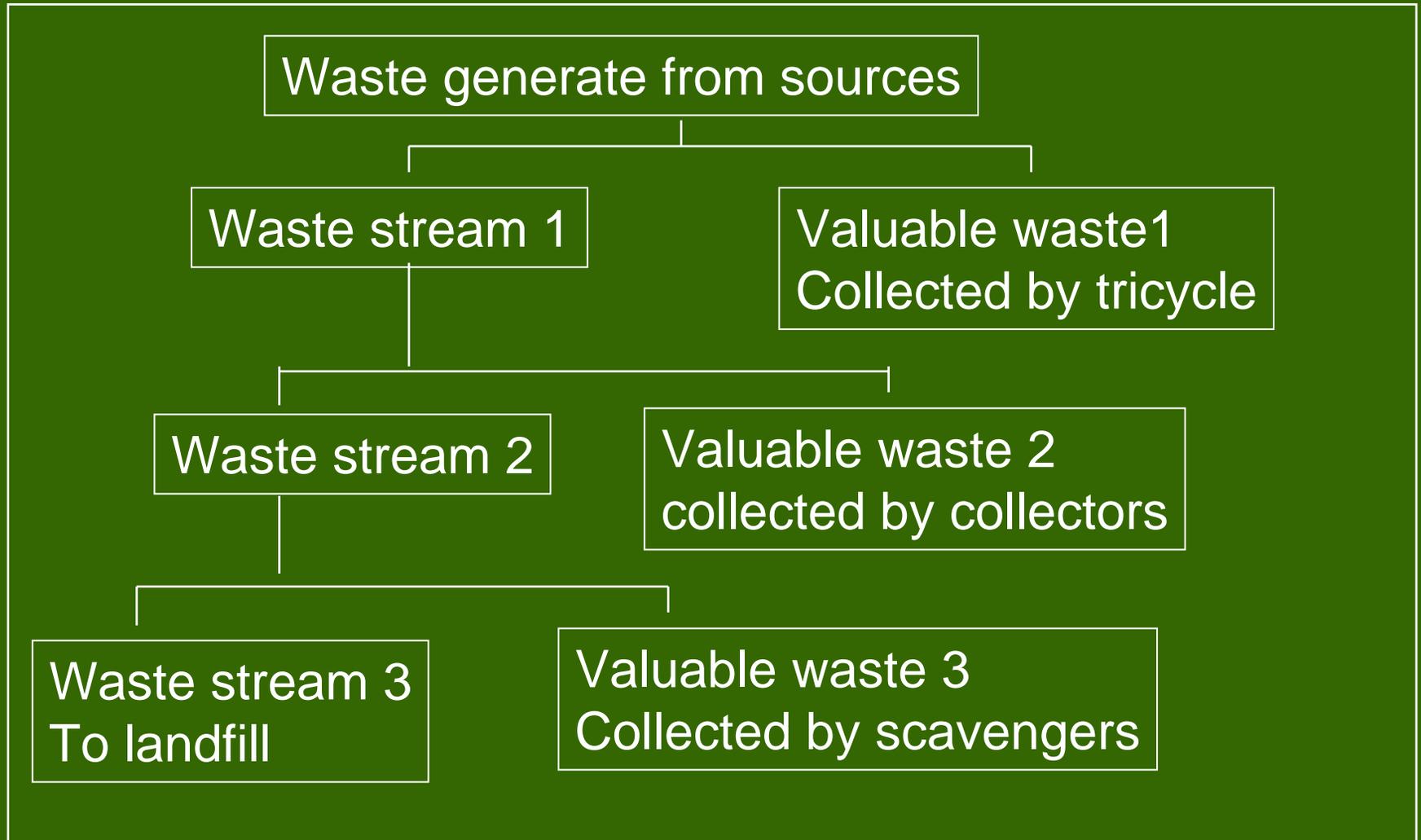
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Discussion (4): Comparison of Solid Waste Stream in Asia

- **2 Waste recycling activities**
 - **Separation at Source (or House): almost every countries for valuables**
 - **Material Recovery Facility: some countries (Philippines, Thailand)**
- **Access to data on recycling is possible.**
- **Pre-treatment (or waste reduction) technologies in Asian countries are composting and incineration.**
- **Waste stream of each countries is also affected from policy of local municipality, law, society...**

Current MSW flow

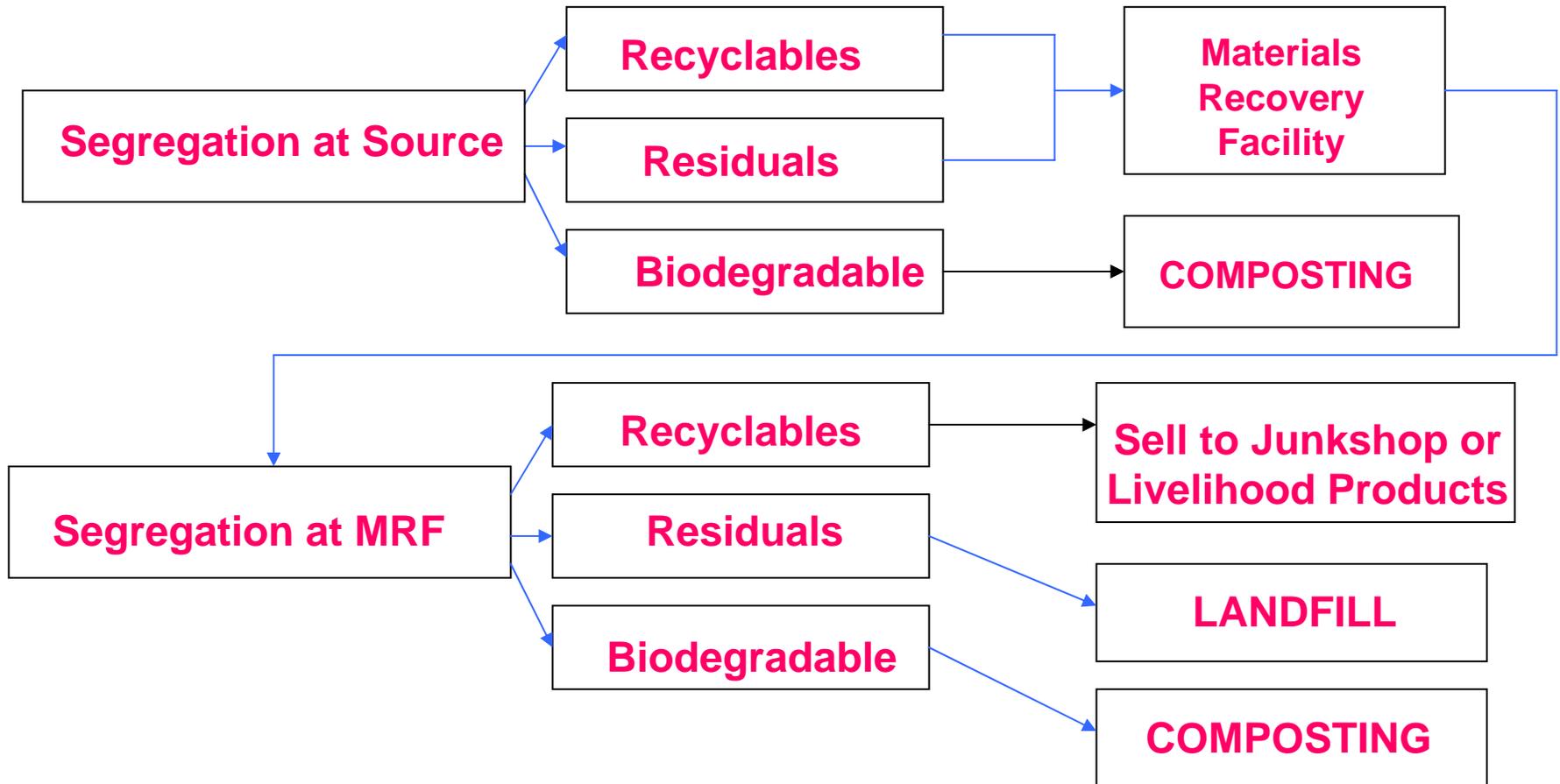
Thailand



SOLID WASTE STREAM

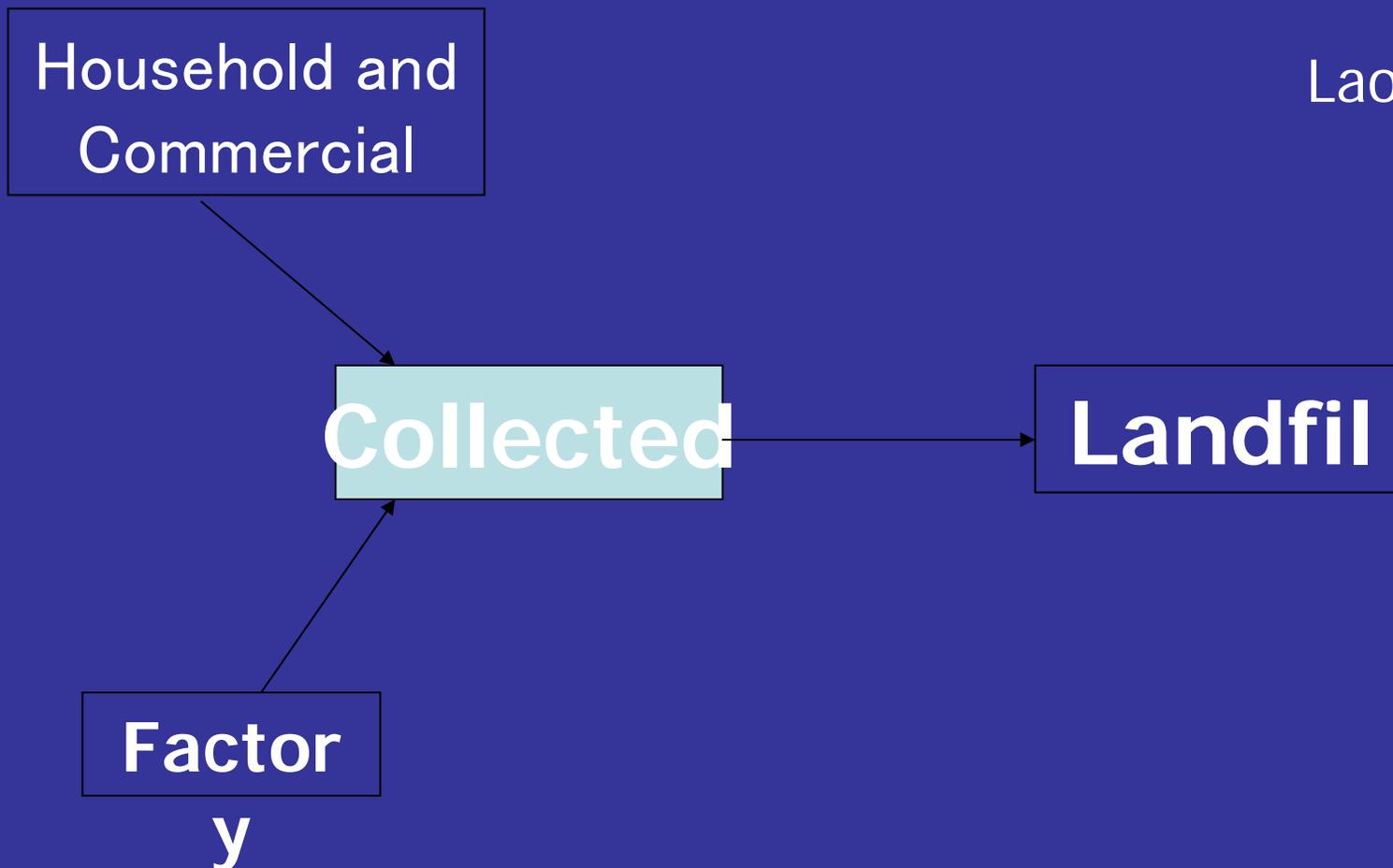
Philippines

FROM GENERATION TO DISPOSAL



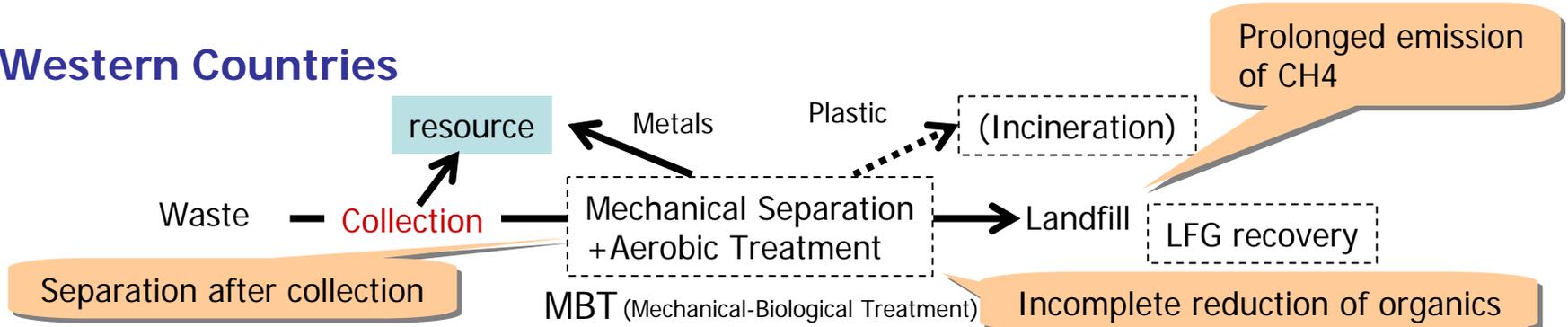
Capital and Industrial Waste Flow

Lao PDR



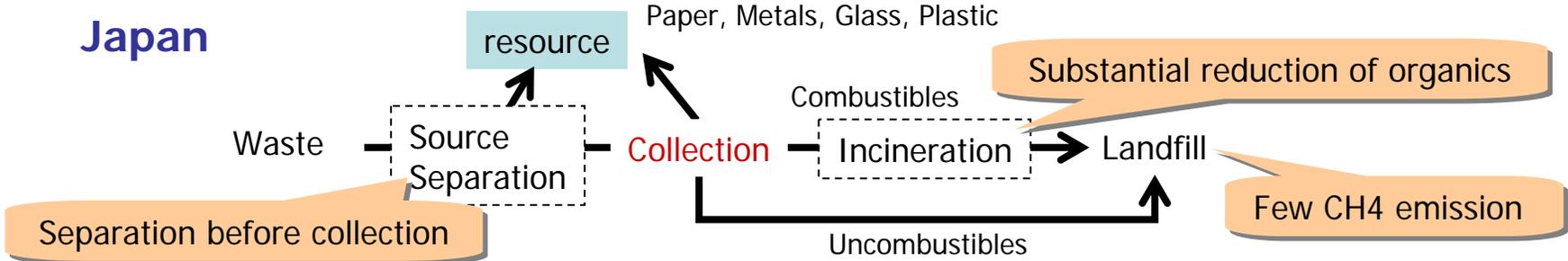
Structures of MSW Stream

Western Countries



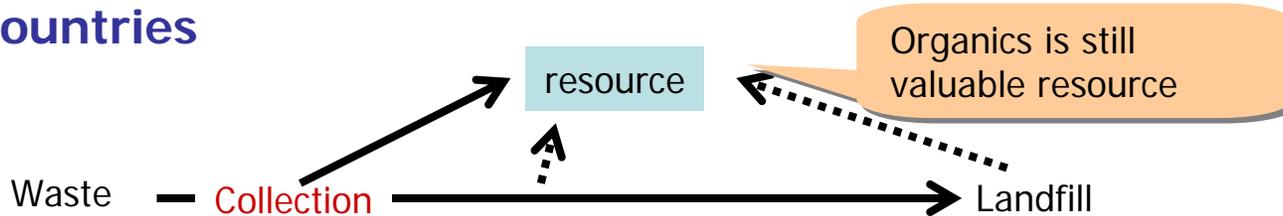
"Mechanical Separation" should be applicable to waste with low water content.

Japan



"Incineration" has been selected due to sanitation of waste with high water content.

Asian Countries



"Resource" includes organic materials with high water contents for composting.

Discussion (5): Comparison of Solid Waste Stream in Asia and Others

- **Database on mass and quality (or composition) of waste and its continuity is important.**
 - This can be also used for future improvement of management with incineration, RDF, Waste to Energy or so on...
 - Composition will be change due to growing recycling activities.
 - Data acquisition is important. **Guideline could be helpful.**
- Main co-benefit in improvement of waste management such as waste recycling and energy recovery depends on country's situation.

Philippines

SOLID WASTE COMPOSITION/SOURCES

Residual (Non-Biodegradable)	
Tin Foil	Shells
Rubber Tires	Plastic Wrappers
Broken Ceramics	Rubber Bands
Broken Bottles	Twine
Broken Glasses	Cups
Cigarette Filters	Toothpaste Tubes
Hair	Shampoo Sachets
Straws	Sanitary Napkin
	Diapers
Weight in kilograms = 2.30 kgs.	
Percentage = 12%	

Biodegradable	
Food Leftovers	Leaves
Vegetable Peelings	
Flowers	
Roots of Plants	Egg Shells
Banana Stalk	Paper
Kitchen Waste	Barbeque
Animal Waste	Sticks
Weight in kilograms = 10.40 kgs.	
Percentage = 52%	

Capital and Industrial Waste

- Only 5 major town has was collection systems
- Disposal Method: Lao PDR
 - Disposal at the land field sites
 - Burning in open areas
 - Dumping on selected spots or water body
- Waste Production in urban areas 0.75 kg per capita per day.

Composition of Solid Waste:

- Organic Material (Compost) - 60 %
- Reuse waste (Glass,can...) - 10-15 %
- Recycle Waste (Plastic , Paper, Steel...) - 10-15 %
- Hazardous Waste - 10 %

(Urban and Commercial Waste has the same composition)

Thailand

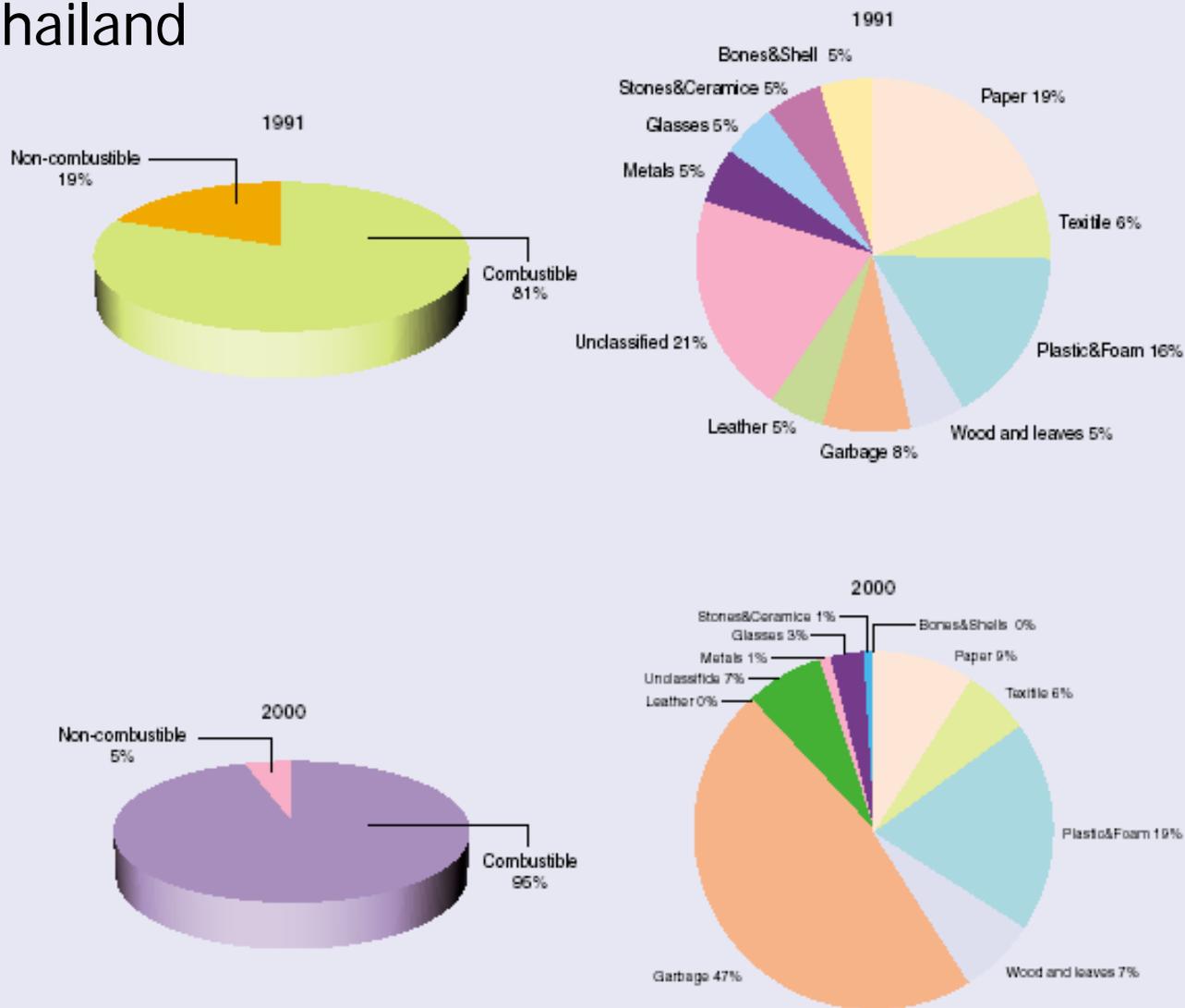
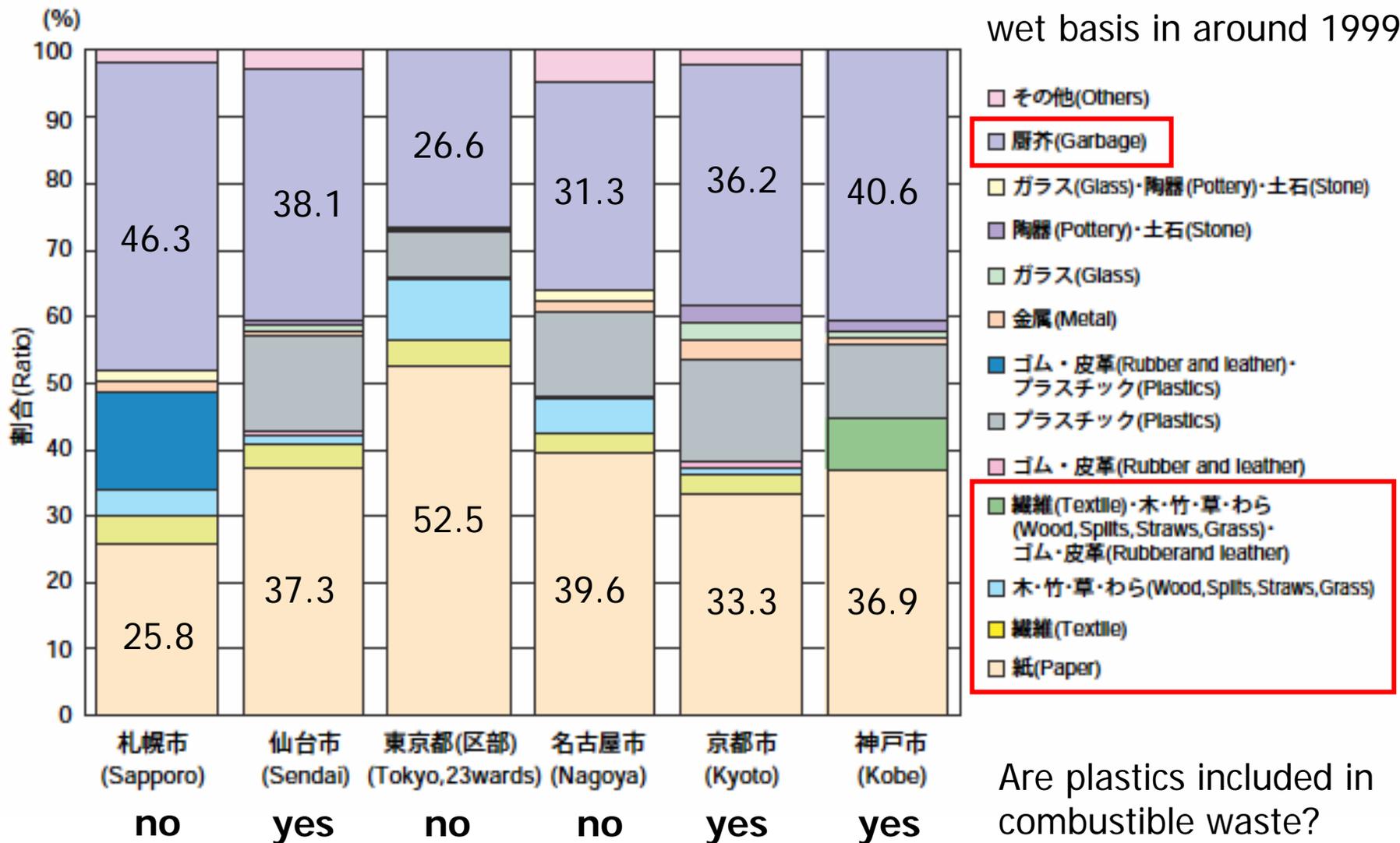


Figure 4.6 Type of Solid Waste composition 1991 and 2000
 (Source : Department of Public Cleansing, BMA,2000)

Japan

Composition of MSW (for combustible waste)



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Co-benefit in Waste Stream Management

Future economic development will change the level of applicable technologies.

Final Disposal Technology

Stepwise Introducing of Scheme/Technology appropriate to Host Countries

Resource Recovery Scheme

Real and substantial merit for developing countries are;

Generation

Mixed MSW

Landfill

Unauthorized Collector

Resource

Including Organics

Appropriate Treatment Technology

Sustainability of System

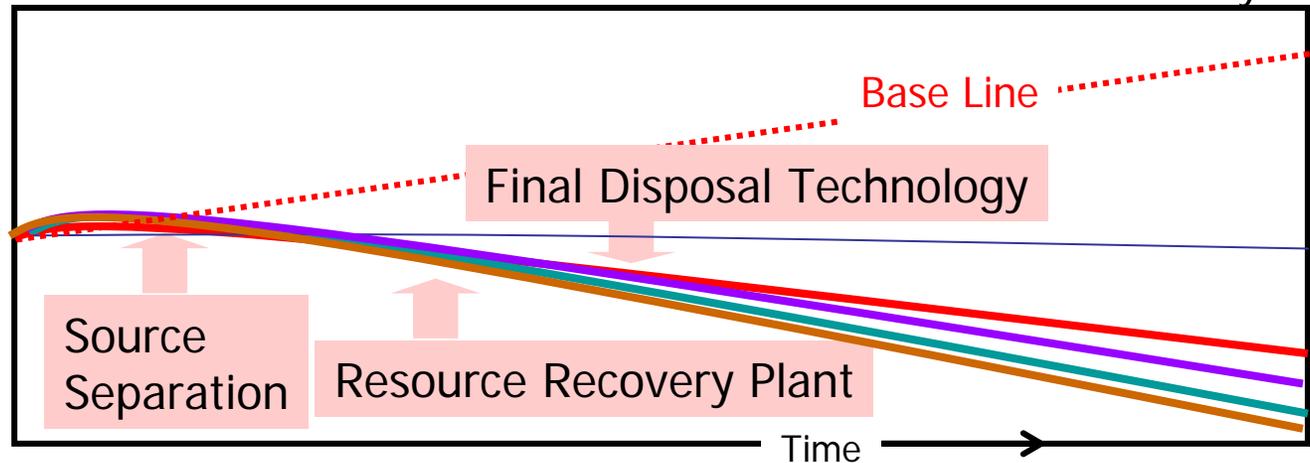
Win-Win Situation

Disposal Mass

Disposal Hazardous Materials

Load to water and air

GHGs Emission



Investment / Cost

Thank you for your attention