

High-Level Seminar on Sustainable Cities
International Zero Carbon City Forum
ASEAN Working Group on Environmentally Sustainable Cities
Session 1 Synergies with circular economy

Municipal Solid Waste in Hanoi City, Vietnam Movements to Development of Circular Economy and Climate Change Adaptation

March 1st, 2023

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Chương 1. Quan điểm, mục đích và mục tiêu xây dựng Đề án

Quan điểm

- **Phù hợp** với quy định của pháp luật;
- **Giảm thiểu tối đa** lượng rác thải xử lý; xây dựng cơ chế thu giá dịch vụ mới phù hợp;
- Tăng cường công tác **tuyên truyền, nâng cao nhận thức, ý thức** của người dân

Mục đích

- Tổ chức triển khai có hiệu quả **Luật BVMT 2020** và các văn bản liên quan đến phân loại rác thải sinh hoạt tại nguồn (PLCTRSHTN)
- **Hướng dẫn** chuyên môn, kỹ thuật, truyền thông về PLCTRSHTN cho các cán bộ quản lý cấp quận/huyện, phường/xã, các tổ chức chính trị - xã hội và các đơn vị VSMT

Mục tiêu

Đến năm 2025:

- ✓ **100%** Q/H xây dựng kế hoạch và cụ thể các phương án tổ chức, lựa chọn đối tượng, địa bàn, mô hình thí điểm
- ✓ Xây dựng hướng dẫn chi tiết về tổ chức PLCTRSHTN; đảm bảo vận hành hệ thống hiện tại hiệu quả và rà soát hạ tầng đáp ứng công tác PLCTRSHTN.

Đến năm 2030

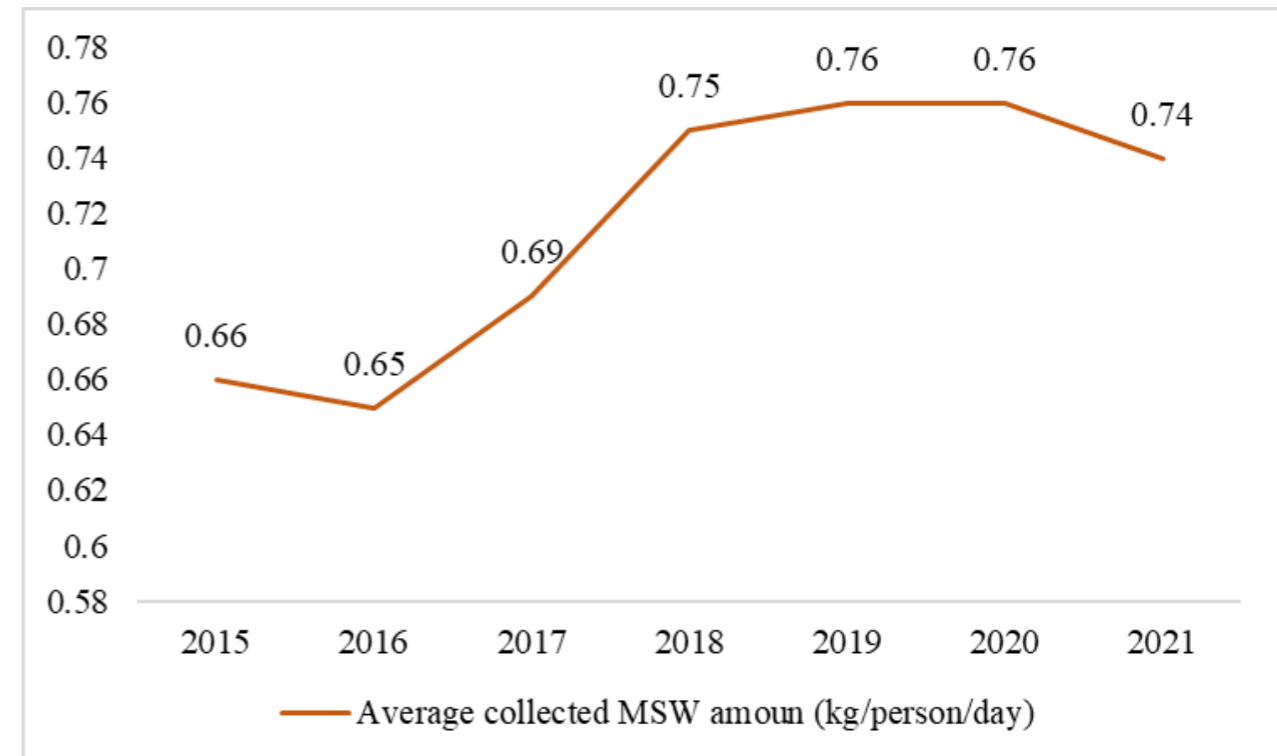
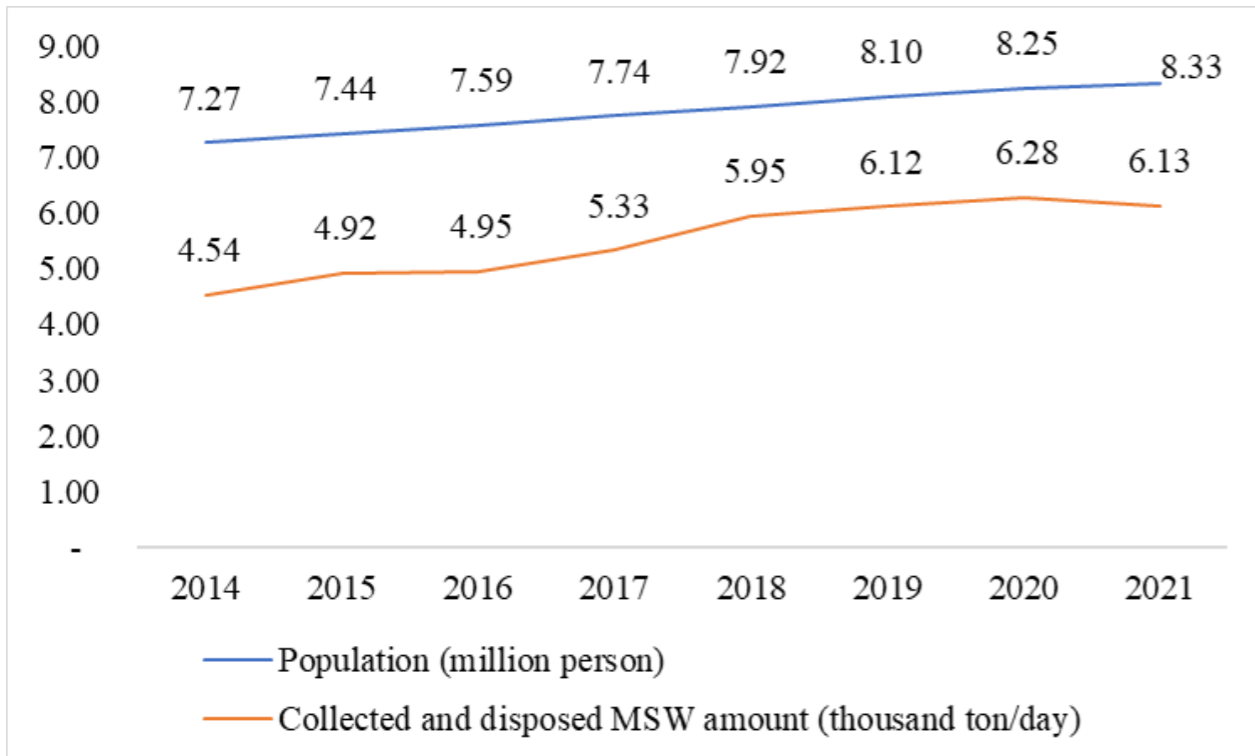
- ✓ Giảm **20%** tổng khối lượng CTRSH phải xử lý cuối cùng
 - Tại đô thị: PL chất thải thực phẩm **10%**, tái chế **30%** và chất thải nguy hại **40%**
 - Tại nông thôn: PL chất thải thực phẩm **40%**, tái chế **30%** và chất thải nguy hại **20%**

2. Current status of MSW generation

Amount of DSW collected and treated :

- 6,128 tons/day in 2021, with a growth rate of 5-10%/year
- 0.74 kg/person/day (2021)

Mainly based on the amount of DSW collected and treated (it is not known how much treatment is done at households: animal feed, composting; selling to informal waste workers, illegal dumping, and uncontrolled burning...)



Source: Department of Construction (Department of Construction)

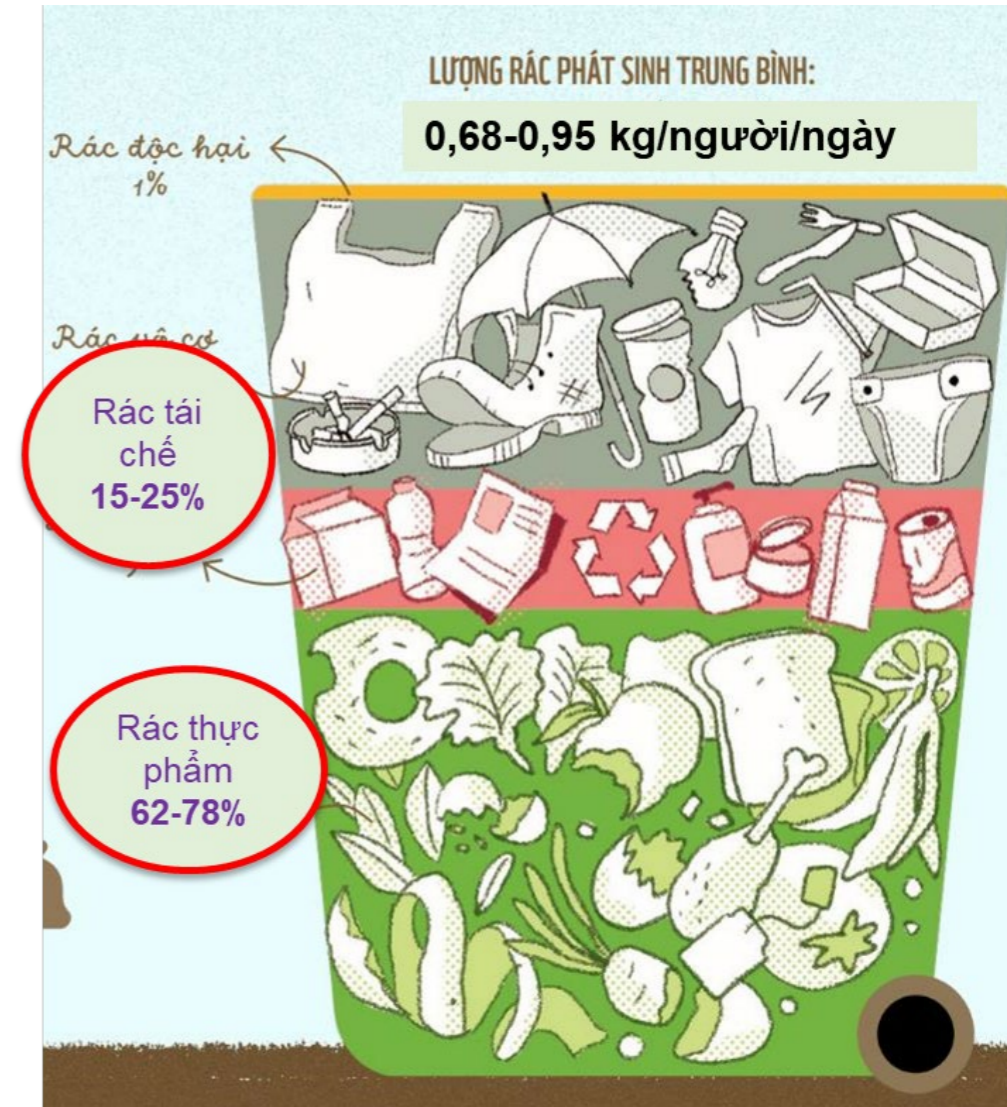
2. Current status of DSW generation

Average DSW generated per capita:

- The DSW generated is **1.23** and **0.98** kg/person/day, respectively, **before** and **after** separating the recovered and recycled components (Source: INEV, 2019)
- Household:
 - urban: **0.75-0.95** kg/person/day;
 - rural: **0.68** kg/person/day (Source: SNV, 2022)

Source (in 2022)	Households (kg/person/day)	Schools (kg/person/day)
Urban	0.75-0.95	0.18 - 0.43
Rural	0.68	

Source: SNV(2022)



2.Current status of DSW generation

Composition of DSW

From household:

- **Food/organic waste** : high rate **62% - 78%**
- **Recyclable DSW** : 15-25% (8-13% plastic)
- **Dangerous waste**: <0.2%

From other sources: schools, offices, restaurants, shopping centers:

- **Recycled waste**: very high rate

At the landfill

- **Food and organic waste** : 37.9%
- **Recyclable DSW**: plastic 18.27%, paper 6.5%.

Bulky waste: illegal dumping, larger than the collection vehicle (hand push gabbage trolley) -> causing damages to equipment

Type/ Sources	Household (%)	Restaurant (%)	Local Market (%)	Schools (%)	At the landfill (%)
Food waste	62-78	50.8	78	9	37.9
Plastic	8-13	26.7	13.06	58	18.27
Paper	6-10	14.99	7.08	21.6	6.5
Metal	0.5- 1.5			1.08	
Hazardous	<0.2				

Source: Synthesized from studies of SNV(2022), Live&Learn (2022), Phuong et al.(2021), JICA Vietnam (2021)

2. Current status of DSW generation

Characteristics of DSW

- **DSW has high moisture:** average 47.9%, organic waste: 80.1%;
- **Rate of combustible waste:** the average rate by volume is 41.4%; the rate of synthetic ash is 10.1%; and the average low calorific value is: 1,000-2,000 kcal/kg.

Average rate of combustible waste by volume (%)	Ratio of synthetic ash (%)	Average waste weight (Household) (kg/m ³)	Low calorific value (kcal/kg)
41.4	10.1	310	1,000-2,000

The source: JICA Vietnam (2021), SNV (2022)

Components	Moisture content (%)
Organic	68-80%
Paper	52.5%
Carton cover	36.2%
Plastic	53.2%
Glass	1.0%
Metal	2.3%
Wood	23.5%
Cloth	49.7%
Rubber	5.8%
Mixture	47.9%

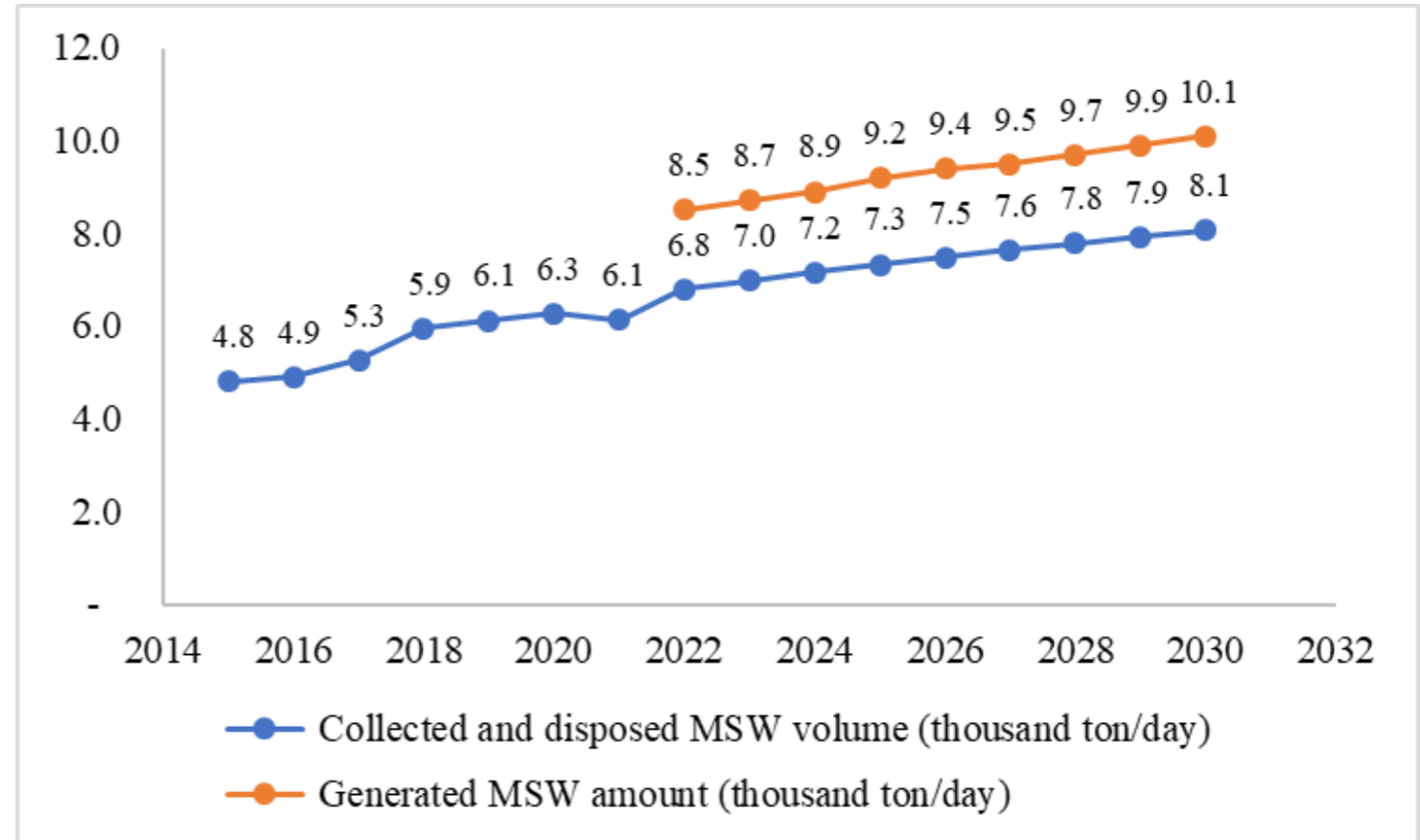


2. Forecast on the volume of DSW in the city till 2030

The volumes of DSW collected and treated (2025 and 2030) are: **7,328.3** and **8,061.9** tons/day

The volumes of solid waste generated (2025 and 2030) are: **9,160.4** and **10,077.3** tons/day

The difference between the two calculations (25%) is due to the incomplete statistics on the volume of waste treated at source and recycled from the informal sector.



Source: SNV (2022) and VWP (2022) calculated using the statistical data of DOC

2. Current status of management

Collection, transportation and treatment of DSW

Collect

- Urban: **96%**, frequency: daily
- Rural: **77%**, frequency: 2-3 days to collect to temporary gathering place, once a week

Transport

- Pickup truck -> Gathering location -> Compression truck -> Landfill/Incinerator
- Average distance: **50 - 90** km
- There are only 4 small and medium-sized transit stations

Treat

- Before 7/2022: **Landfill (98.5%), incineration (1.5%)**
- From 7/2022: Operate Thien Y treatment plant, **burn rate increases to 16.4%**



2. Current status of management

Collection and treatment of recyclable waste

- **Rate of recyclables collected:**
 - About **10%** (informal waste workers (IWW): 4-6%, envi & sanitation workers: 4%, and resell to IWW/waste aggregators/dealers).
 - The highest percentage of recycled waste sold to IWW can be up to **20.51 %**.
- **Mostly informal sector participates:** there are nearly **1,000** aggregator establishments, more than **85,000** participants (IWW, waste pickers, craft village workers ...)
- **Recycling craft villages:**
 - Hanoi (plastic recycling in Xa Cau, Trung Van, Trieu Khuc...), Hung Yen (plastic recycling), Bac Ninh (paper, metal recycling...).
 - Outdated technology, often fail to meet environmental and occupational safety standards.



2. General comment

- **Data/Statistics** on the total volume of all and each source: incomplete and not specific, only able to count the volume collected, transported and treated;
- The above analysis shows the **necessity to sort DSW at source**:
 - ◆ **Food waste**: accounts for the highest proportion, ***will be very valuable if it is classified well to make compost, biogas, animal feed, etc.,***. High humidity, if mixed, will result in difficulties for combustion technologies, recycling ...
 - ◆ **Recycled waste**:
 - A very high percentage comes from organizational sources (schools, offices, restaurants, shopping centers...): ***need to prioritize the classification as well as establishing centralized collection points at these sources.***
 - At the landfill, recyclable waste still accounts for a high proportion (especially plastic): ***need to do absolute waste sorting at source.***
 - ◆ **Groups of hazardous, bulky and inert waste**: ***need to be classified and preliminarily processed to have an appropriate treatment plan***

2. General comment

- It is necessary to consider the infrastructure system, set up centralized collection points, transit stations, vehicles and workers as well as re-route the collection routes in accordance with the new regulations;
- The landfill is overloaded, and the energy generating incineration will reduce the pressure on landfills. However, it is necessary to invest in technology for centralized composting in accordance with the trend of sustainable management.
- Informal forces play an important role in the collection, sorting and treatment of recyclables.



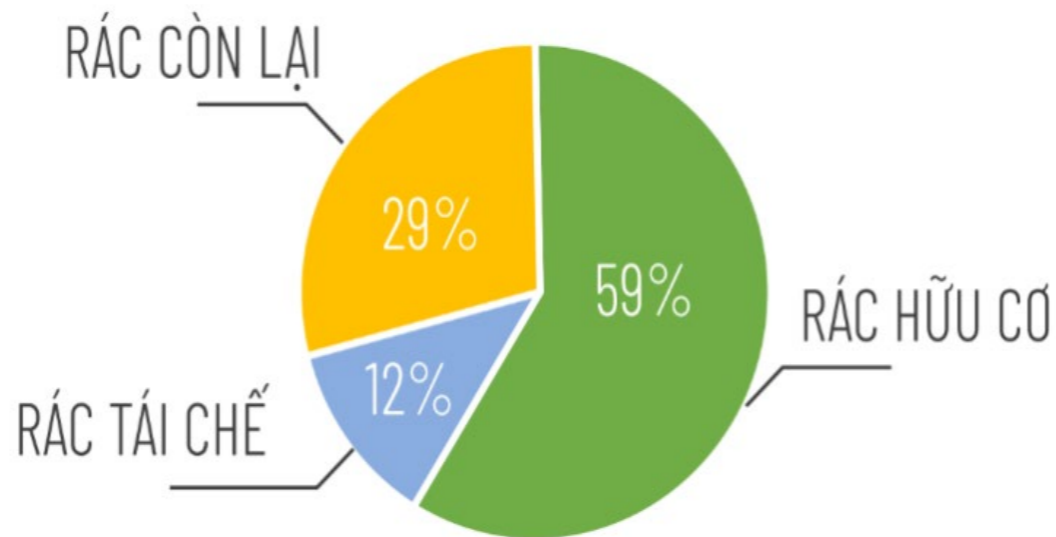
3. MOVEMENTS TO CIRCULAR ECONOMY AND CLIMATE CHANGE ADAPTATION OF MSW MANAGEMENT

3.1. Opportunities, advantages of legislation system and

- The Law on Environmental Protection was promulgated in 2020, effective from January 1, 2022 with aim to implement source separation at source and increase recycling waste, reduce landfill rate to mitigate GHG emissions.
- The Decision No.687/QD-TTg of the Prime Minister on June 7, 2022 approving the scheme for circular economy development in Vietnam;
- The perception of the Party committee, government and people has changed, with positive results from a number of pilot models.
- The technical infrastructure for solid waste management is getting more and more complete. The network of waste collection and transportation is increasingly mechanized and digitized, covering most of the districts.
- The solid waste management apparatus is gradually being synchronized and perfected.
- The city receives a lot of technical assistance and experience sharing from international organizations (JICA, AFD, IRD, USAID, UNEP...) and the participation of local NGOs in the field of solid waste management (Live&Learn, CECR...) and businesses

3.2 Sound practices in Hanoi

- **2006-2009** : Implemented pilot sorting in 4 wards: not effective and not maintained, people were still not satisfied
- **Recently (2020-2022)** :
 - Sorting recyclables: Pilot in Hoan Kiem and some schools (together with URENCO, Women's Union, schools, companies, NGOs, volunteer groups...)
 - Sorting food & organic waste: typically in Dong Anh (more than 20,000 people) and now more than 10 districts are promoting. *The percentage of waste reduction (including food waste and recyclable waste) is from 50% to 70% of the total waste generated by participating households.*



3.2 Guidance on the organization of MSW sorting and management

Classification principle

Type of waste	Before sorting	Sorting	Collection, Transport	Treatment
(1) Waste can be reused, recycled	<ul style="list-style-type: none"> - Encourage reduction in use and reuse. - Keep dry, clean and neatly pack into the available packaging 	Bring to centralized collection locations (in residential groups, schools, shopping malls, supermarkets ..)	Collect as per schedule	Recycling facility
		Handover to the collection unit on scheduled dates		
		Sell to IWW		
(2) Food and organic waste	<ul style="list-style-type: none"> - Drain water. - Tidy up tree branches, large garden garbage 	Self-treat to make compost or animal feed at home	Collect as per schedule	Centralized organic waste treatment
		If the locality applies centralized organic fertilizer treatment technology: Contain, put separately into specialized containers.		
		If the locality does not treat centrally organic fertilizers: Contain, put in the remaining waste bag *		Treatment using existing technology
(3) Hazardous waste	Do not mix with other wastes	Bring to the prescribed collection point (specified by People's Committees at all levels).	Functional unit shall collect	Treatment in accordance with rules
(4) Bulky waste	Compact, reduce size to be able to further classify	Self-transport or hire a unit with transport function to transport to the gathering point or to the treatment facility (specified by PCs at all levels).*	Units with the function of collecting or receiving	Treatment using existing technology
(5) Remaining waste		Contain, put separately in the package*	Collect as per schedule	Treatment using existing technology

3.3 Efforts for climate change adaptation in MSWM

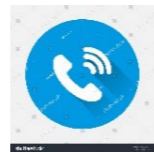
- Landfill restoration and rehabilitation nationwide to cutting down the GHG emission from landfill gas
- Joining the JCM mechanism with the Japanese government by introducing new environmentally friendly technology for waste disposal and manufacture
- Increasing MRF, and RDF facilities to save the materials ...



Thank you for your attention!



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