

# Solid Waste Management of Cambodia

Regional Workshop of the GMS on "the National Strategy of Integrated Solid Waste Management/3R"  
28-29 July 2010, Hai Phong, Viet Nam

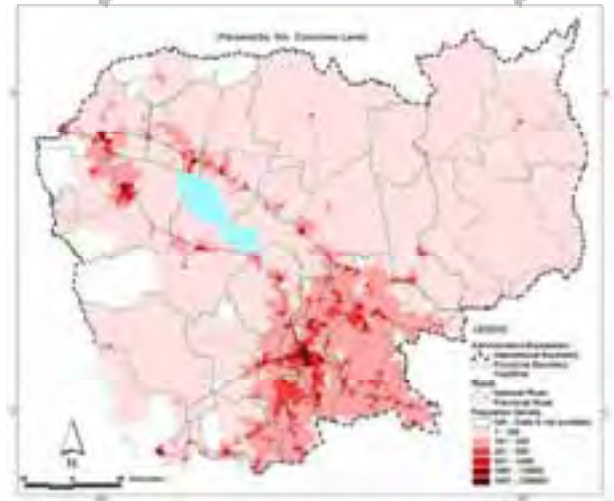
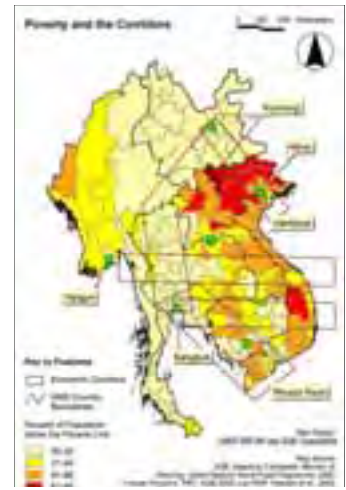
*Cambodian Participants  
Ministry of Environment, PNH,  
Cambodia*

## Outlines

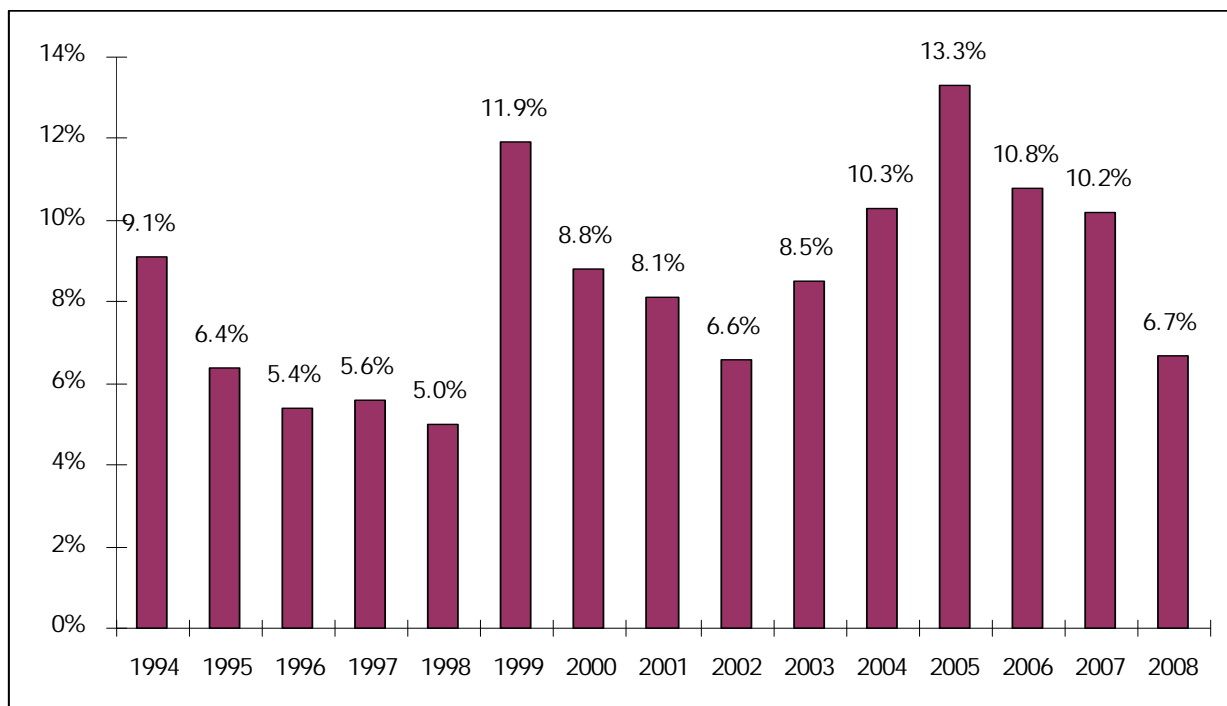
- Cambodia At A Glance
- Phnom Penh Population & Growth
- Municipal Solid Waste Management
  - Issues
  - Constraints & Challenges
- Waste Recycling Practices

# Cambodia At A Glance

- Cambodia is more than Angkor Wat – covers 181,035 sq. kms
- Population
  - 13.4 mil. as of March 2008 Census
  - 14.1 mil. projected in 2010
- Annual Pop. Growth Rate
  - 1.54% in 2008 and
  - 1.35% in 2010



## Annual Economic Growth Rate: 1994 -2008



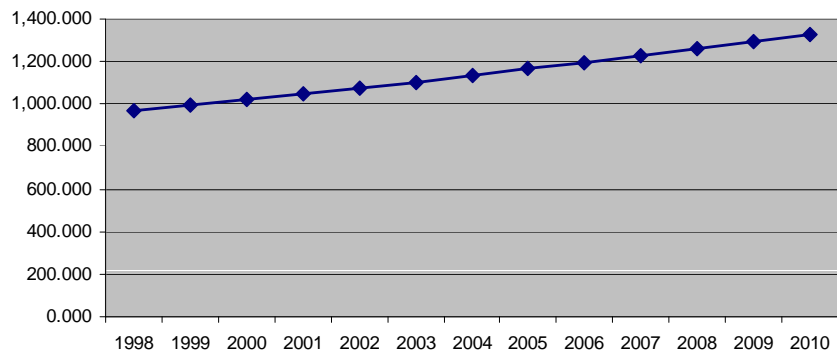
Source: National Institute of Statistics, Ministry of the Economy and Finance, National Bank of Cambodia, IMF

# Phnom Penh/Municipal Population

Population in '000' (March 2008 Census)	
1998	967.192
1999	993.219
2000	1,019.946
2001	1,047.392
2002	1,075.578
2003	1,104.521
2004	1,134.244
2005	1,164.766
2006	1,196.109
2007	1,228.297
2008	1,261.350
2009	1,295.292
2010	1,330.149

## Phnom Penh Municipality

Land Area in Km2	290
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## Urban Solid Waste Management

- Solid waste is classified into three categories:
  - *Domestic,*
  - *Industrial, and*
  - *Hospital wastes.*
- Different procedures set to practice for waste management, esp. the collection, transportation & disposal.
- Current mangt. practice yet to be good as negative impact to the environment (water, soil and air), biodiversity and human health seen.

# Issues in Solid Waste Management

- Piles of solid wastes are found, left decayed at public, residential, channel & low-land areas in some places in cities.



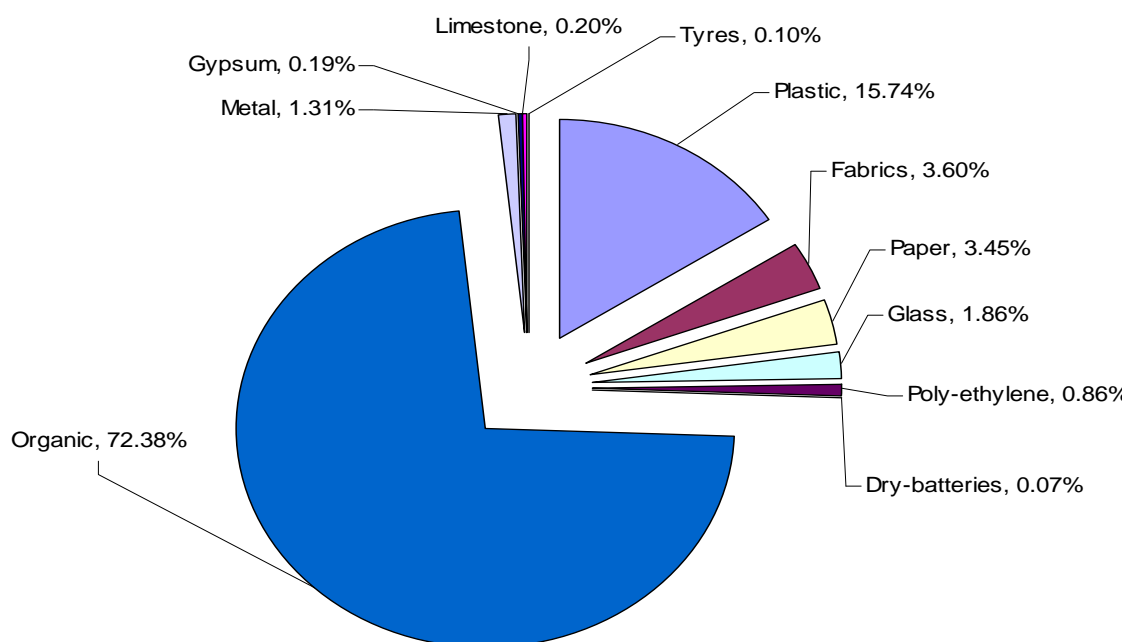
- Similarly, the solid wastes generated from houses, commercial centers, hospitals, industrial handicrafts, etc. are disposed of and burnt at the dumpsite, while some is found to be decomposed of under weather conditions.



- Solid waste collected from various sources are not separated, then disposed of at the open dump site.

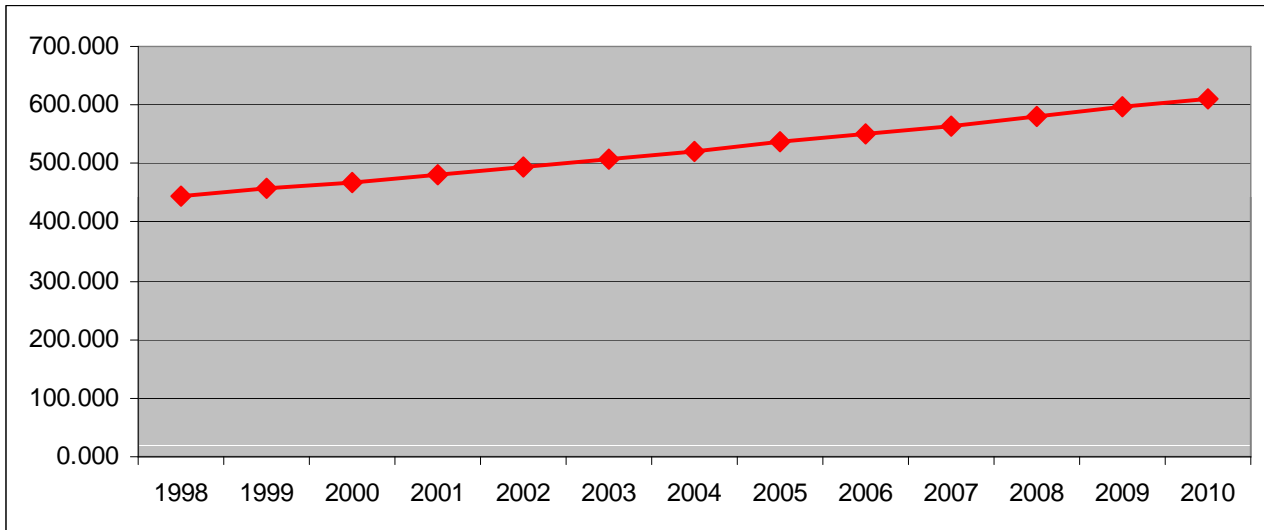


## Composition of Solid Waste Disposed of at the Dump Site

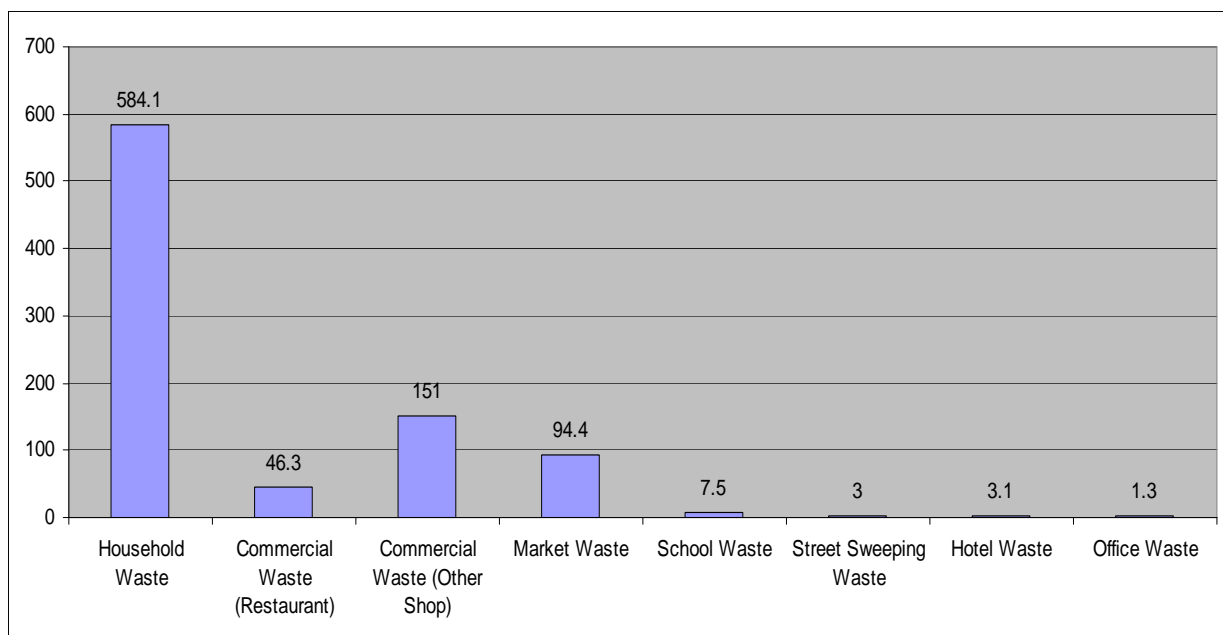


# PNH Solid Waste Generation

- **From Household:** PNH waste daily generated is about 0.46 kg/capital/day. Presently, the max. amount of waste generated is more than 600 tons/day.



## Daily Generated Amount of Solid Waste in the Municipality



Data Source: Municipal Solid Waste Study by JICA in 2005

# Daily Generated Amount of Solid Waste in the Municipality

Generation Source	Unit	Number of Generation Source	Generation Ratio			Daily Generation Amount (ton/day)		
			Dry season	Rainy season	Average	Dry season	Rainy season	Average
Household Waste	g/person/day	1,199,414	498	476	487	597.3	570.9	584.1
Commercial Waste (Restaurant)	g/table/day	27,808	1,940	1,387	1,664	54	38.6	46.3
Commercial Waste (Other Shop)	g/shop/day	33,524	4,566	4,437	4,502	153.1	148.8	151
Market Waste	g/stall/day	51,766	1,700	1,945	1,823	88	100.7	94.4
School Waste	g/student/day	385,013	18	21	20	6.9	8.1	7.5
Street Sweeping Waste	g/km/day	56	47,235	59,510	53,373	2.6	3.3	3
Hotel Waste	g/room/day	13,385	199	263	231	2.7	3.5	3.1
Office Waste	g/office/day	368	2,946	4,174	3,560	1.1	1.5	1.3
Total						<b>905.7</b>	<b>875.4</b>	<b>890.6</b>

Data source: Municipal Waste Study by JICA in 2005

## PNH Waste Generation Based on JICA Study in 2007

	2003	2004	2005	2006	2007
<b>Daily Waste Generation (T/day)</b>	928	986	1,043	1,101	1,159
<b>Annual Waste Generation (T/year)</b>	338,647	359,717	380,786	401,856	422,926
<b>Solid Waste Collected (T/year)</b>	240,859	227,910	266,781	324,159	343,657
<b>Solid Waste Uncollected (T/year)</b>	97,788	131,807	114,005	77,697	79,269
<b>% uncollected</b>	29	37	30	19	19

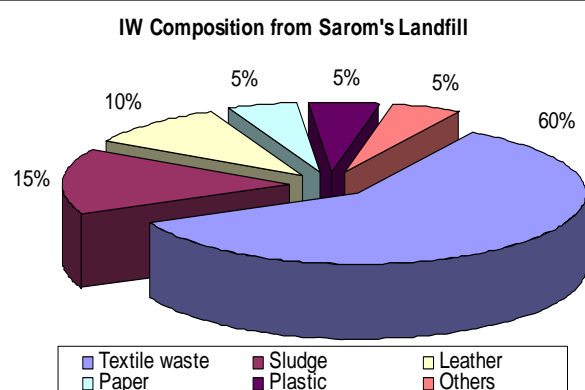
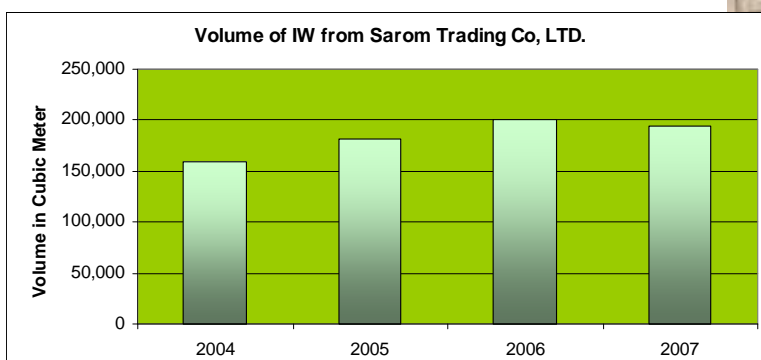
Sources: JICA, 2007; Waste transported to Steung Meanchey Dumping Site (MoE, 2008)

# Companies Licensed for Waste Collection and Disposal in PNH

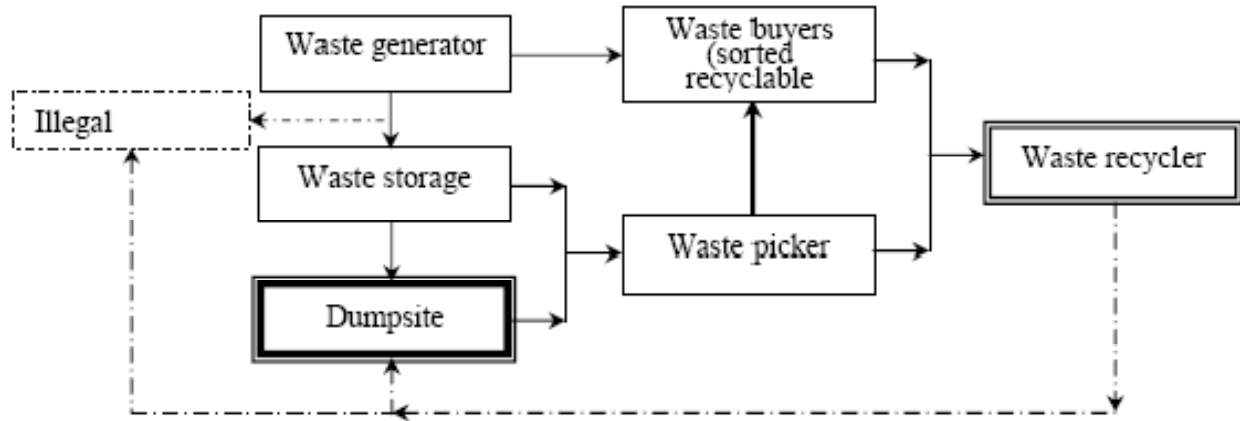
1. CINTRI was licensed in 2002 to collect the domestic waste;
2. Sarom Trading Co, Ltd. was provided license in 2002 to collect the General Industrial Waste; and
3. Solid Waste Management Authority of the municipality in charge of collecting the infected waste only from the hospitals.

(Companies --- poor performance, lack of experiences yet caused waste collection and management problems.)

## Volume of Industrial Waste disposed in Sarom Trading Landfill from 2004-2007 (MoE, 2007)

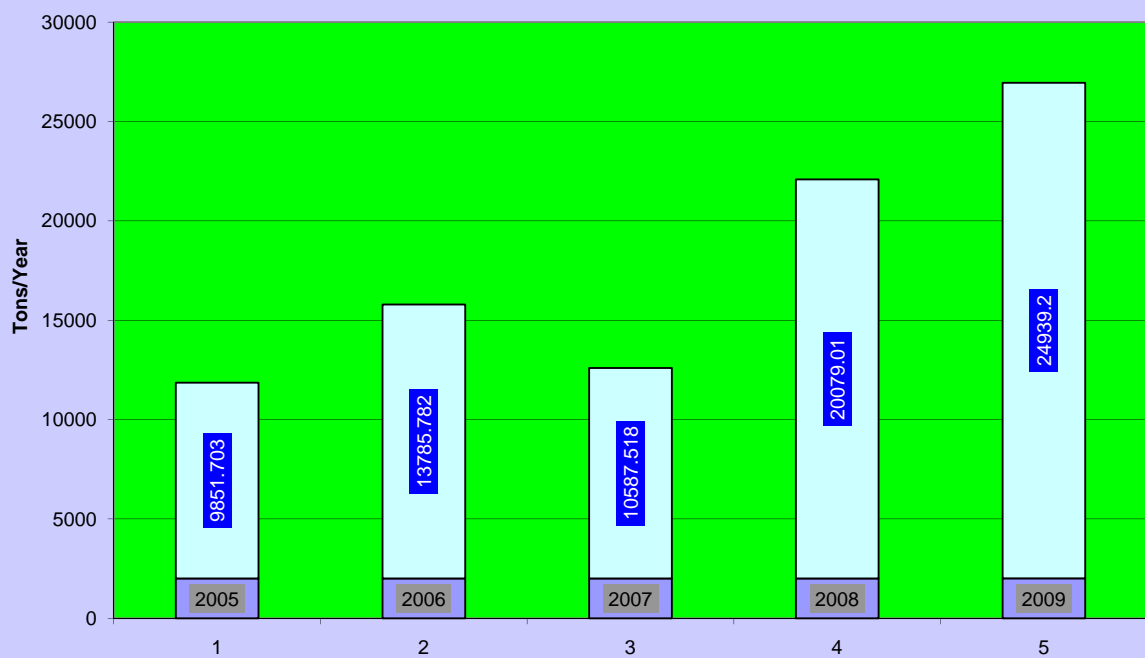


# Collection Process & Recycling: Domestic Waste Mangt Flow Chart





Volume of Scrap-Clothes Exported



# Composting

- Composting place is operate by Cambodian Education and Waste Management Organization. It can produce more than 200 t / year.

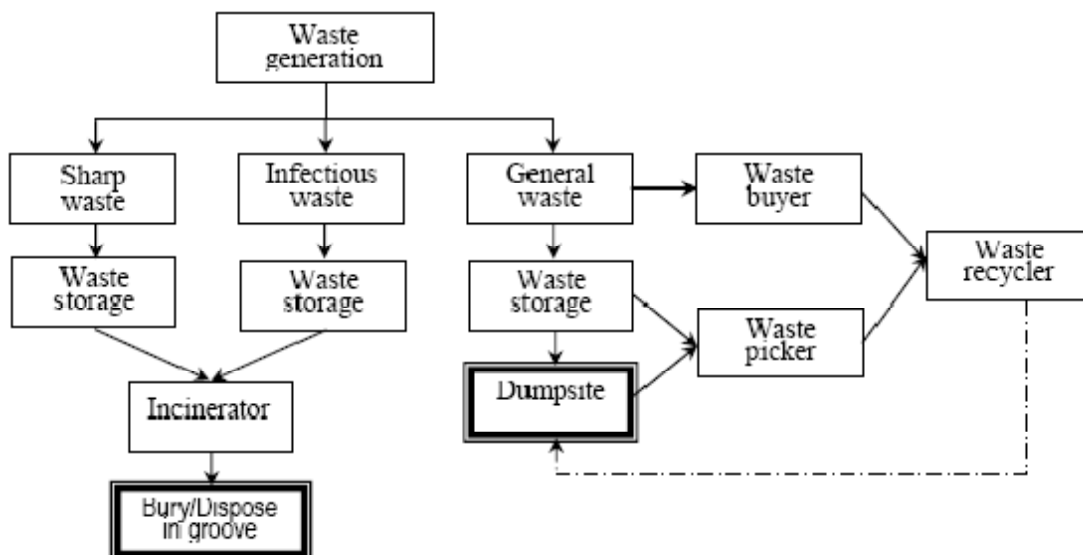


## Composting in Community





## Collection Process & Recycling: Medical Waste Mangt Flow Chart



# Existing Legislations

- Sub-decree on Solid Waste Management (MoE) approved in 1999;
- Directive on Industrial Hazardous Waste Management (MoE) -- May 26, 2000;
- Directive on Industrial Sludge Management (MoE) -- October 9, 2000;
- The Joint Prakas19 on Solid Waste Management in Cities and Provinces made between the MoE and the Ministry of Interior (Mol); and
- The "Directive on Managing Health Wastes in the Kingdom of Cambodia" approved in 2008 by the Minister of Health.

# Constraints & Challenges

- Effective solid waste mangt facilities, technology and sound management;
- Impacts to environment & human health;
- Waste separation by types & proper disposal;
- Waste recycling;
- Enforcement of existing laws/regulations;
- Additional binding instruments developed;
- Lack of capacity;
- Awareness raising program;
- Stakeholders' collaboration & public participation;
- Data collection & monitoring/evaluation; etc.

**Thank you so much!**