Trends in Solid Waste Management: Issues, Challenges and Opportunities

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Surya Prakash CHANDAK
Deputy Director
UNEP DTIE IETC

United Nations Environment Programme
Division of Technology, Industry and Economics
International Environmental Technology Centre

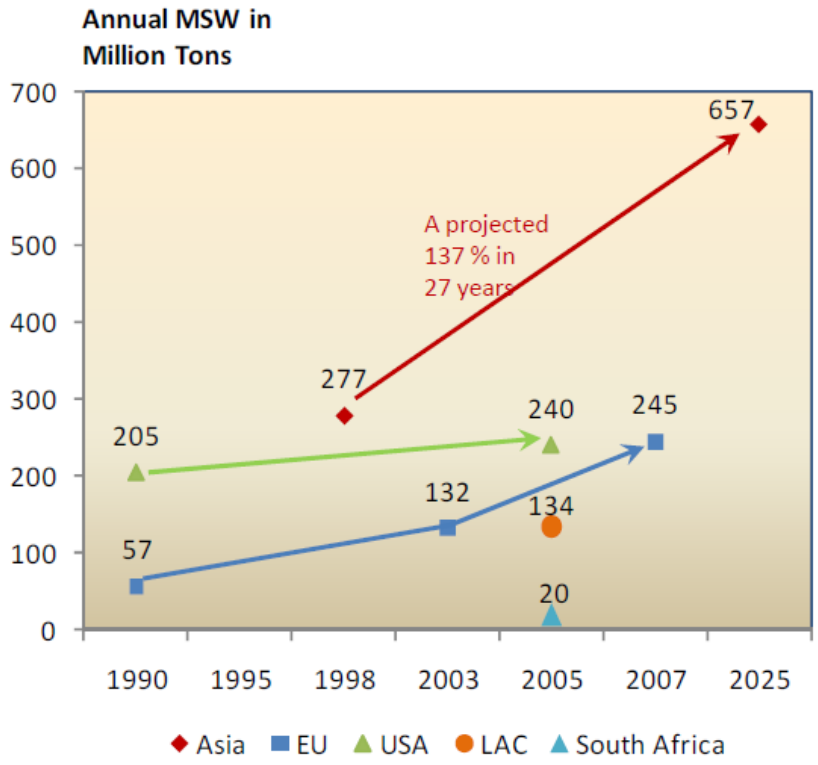
Trends

1. Trends in waste volume
2. Trends in waste recycling
3. Trends in waste disposal

1. Trends in waste volume

Globally, 2.5 to 4 billion tons of waste was generated in 2006

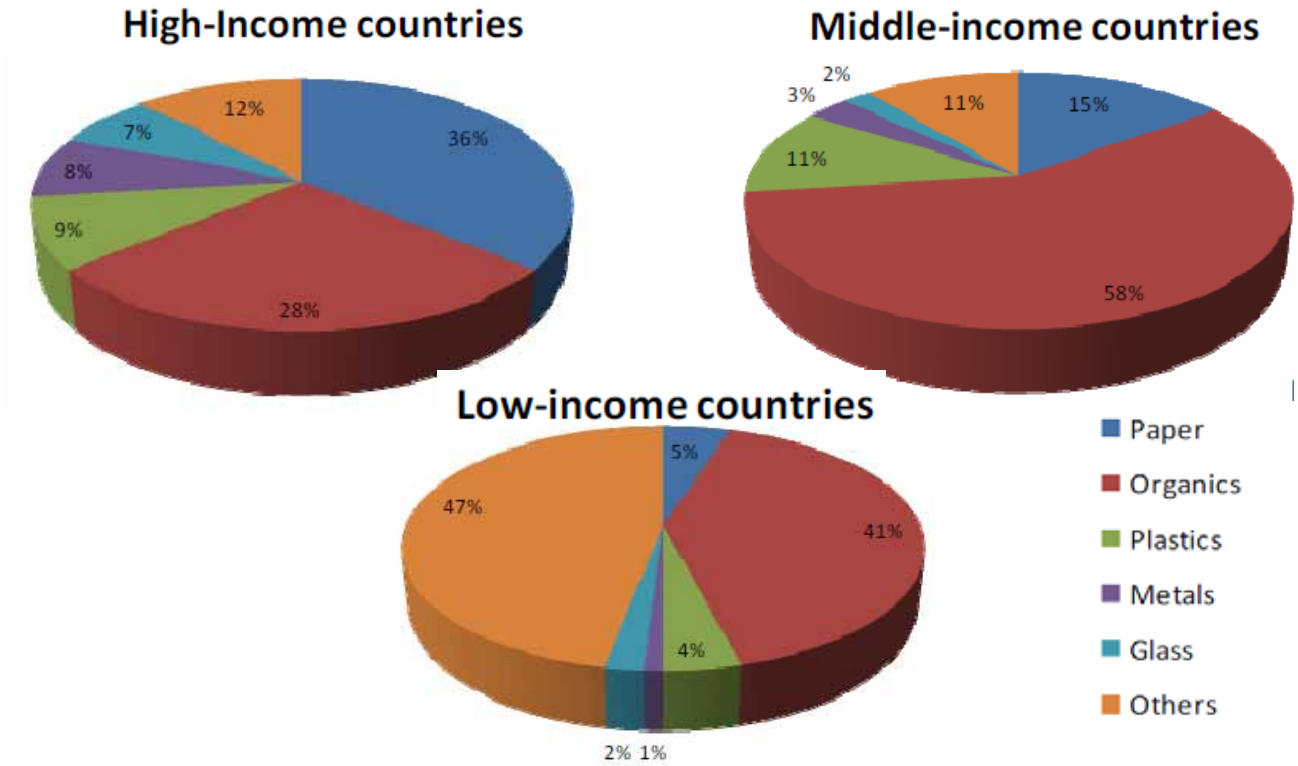
MSW	Worldwide: 1.84 billion tons (2004) 25 OECD countries: > 610 million tons (2006)
Industrial non-hazardous waste	Typically 1.1 – 1.8 billion tons in countries like EU, USA, China (2006)
C&D	10-15% of total waste in developed countries (2006)
Hazardous waste	338 million tons (2001)
E waste	20 – 50 million tons world wide (2005)
Automobile	8 – 9 million tons in EU (2006)



Source: Arunprasad, Swati. (2009) "Waste Management as a Sector of Green Economy," Presentation at International Forum on Green Economy, Beijing, China, November 2009.

1. Trends in waste composition

- Shift from high organics to higher plastic and paper corresponding to increase in relative standard of living



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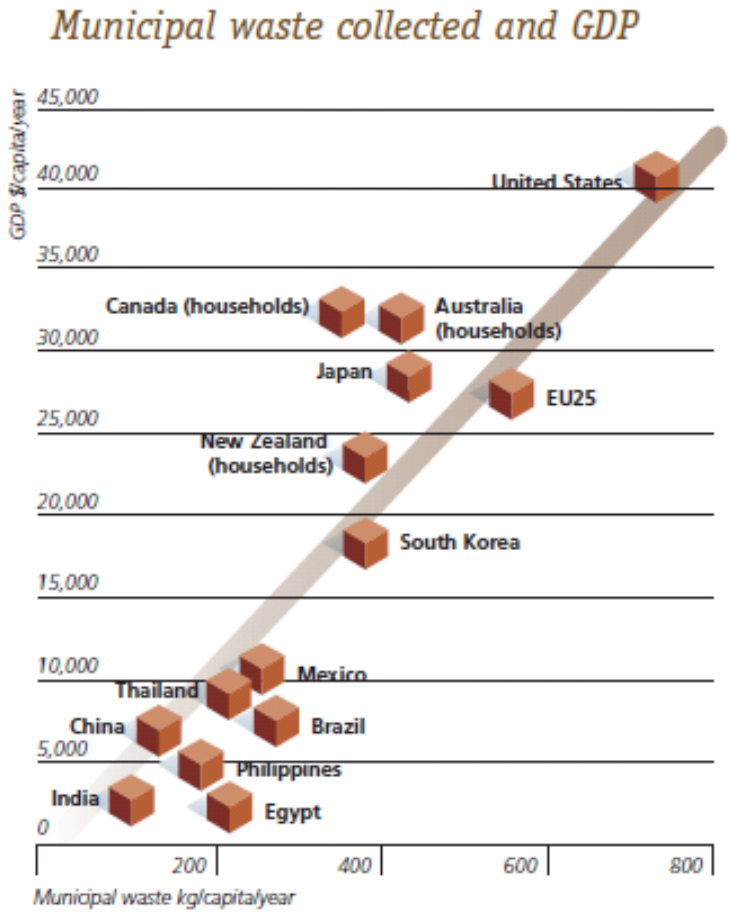
1. Trends in waste and GDP relationship



Sources: National Environmental Agencies, OECD, FAO, CyclOpe

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2. Trends in waste recycling

Estimated size (for 2004) of main world secondary material

Material	Market Size million tons
Recovered fibers (paper)	170
Recovered ferrous metals (scrap metals)	405
Recovered non-ferrous metals	24
Recovered plastics	5
TOTAL	Approx 600

Source: Lacoste and Chalmin 2007

2. Trends in waste recycling

Recovery of materials from municipal waste in Europe and the United States
(in thousand metric tons)

	Germany	France	United Kingdom	Italy	Spain	Remaining EU 15 (1) +NO+Switzlerand Estimate	Total Europe	Etats Unis
Paper and cardboard (2)	8,500	5,200	3,700	2,000	3,500	9,800	32,700	40,000
Plastics	3,850	350	450	350	310	1,200	6,500	1,930
Glass	3,300	2,000	1,500	1,000	510	1,690	10,000	2,350
Non-ferrous metals	1,204	1750	75	278	121	797	3,975	1,750
Total	16,854	9,300	5,725	3,628	4,441	13,487	53,175	46,030
Batteries	11.5	9.6					28	
End of life vehicles Ferrous Metals							11,000	17,000

(1) Estimate: 30% of paper, 20% of plastics, 20% of glass and 20% of non-ferrous metals are recovered in the remainder of the EU15.
(2) Paper and cardboard are recovered from municipal and industrial waste

Sources: National Environmental Agencies

2. Trends in waste recycling

- Waste reduction at source implies minimizing material and energy consumption including reduction in use of toxi/hazardous substances.
- Reducing material/energy intensity in production and consumption of goods and services has been widely recognized as preferred approach by many international organizations and national governments. Some examples are; UNEP/UNIDO Cleaner Production approach, China's circular economy approach, Japan's sound material recycling society and 3R approach, EU's waste prevention and recycling strategy, etc.

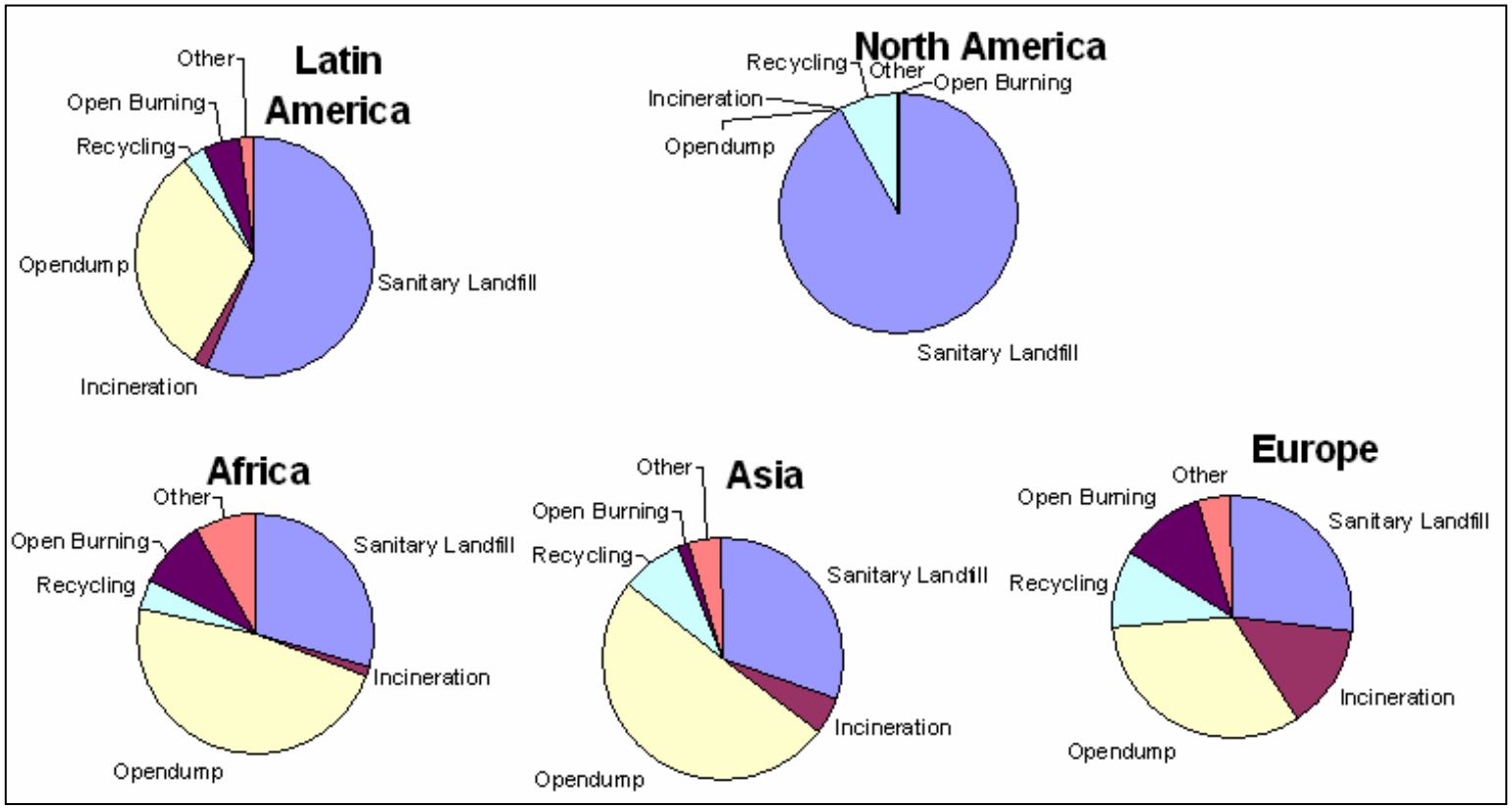
2. Trends in waste recycling

- Huge recovery potential both due to financial attractiveness and technology development
- Main materials recovered include; plastic, paper, glass, metals, textiles, etc.
- Waste to energy conversion is rapidly increasing. Several technology routes now available, e.g., biomethanation (for organic waste, direct incineration with energy recovery, pyrolysis, etc.)

2. Trends in waste recycling

- Levels of material recovery vary widely – from 8% in Greece to 62% in Austria.
- Material recovery in developed economies is in the organized sector, whereas in developing countries through informal/unorganized way.
- Various policy instruments and approaches have been developed, e.g., Extended Producer Responsibility, deposit systems, segregated waste collection systems, support for cleaner production, support for recyclable products etc.

3. Trends in waste disposal



Source: UNEP

Increasing severity of impacts

Payatas, Philippines

- Severe health impacts particularly on community in vicinity of dumpsites.
- Pollution of surface and sub-surface water bodies due to leachate contamination.

Nairobi, Kenya

- Air pollution from emissions of spontaneous combustion in dumps.
- Adverse impacts on fauna and flora.

Increasing cost of waste management

OECD countries:

Municipal waste – USD120 billion/year

Industrial waste – USD150 billion/year

Developing countries:

20-50% of recurring budget of municipalities is spent on solid waste management although only 50% of urban population is covered. In low-income countries collection alone drains 80-90% of total waste management budget.

Issues for waste management

General issue - types of solid waste

Main issue – change of perspective

20th CENTURY	21st CENTURY
WASTE MANAGEMENT	RESOURCE MANAGEMENT
"How do we get rid of our waste efficiently with minimum damage to public health and the environment?"	"How do we handle our discarded resources in ways which do not deprive future generations of some, if not all, of their value?"

Source: Dr. Paul Connett, Zero Waste, Power Point

Issues for waste management

As per waste management chain

- Source segregation, collection
- Treatment and disposal
- Resource generation

Issues for waste management

As per action category

- Policy issues
- Technology issues
- Financing issues
- Trans-boundary movement related issues
- Others

Opportunities from waste management

- Waste minimization – Key to enhancing resource efficiency and competitiveness – several initiatives already in place, e.g., UNEP/UNIDO Cleaner Production approach, China's circular economy approach, Japan's sound material recycling society and 3R approach, EU's waste prevention and recycling strategy.

Opportunities from waste management

- The waste market – High economic value being attributed to "waste"

  OECD municipal waste market – USD125 billion
  Emerging economies (Brazil, China, India) – USD25 billion
  Increase in global MSW market (2007-11) – 37.3%

- Waste a latent resource – recovery of materials and energy from waste

  World secondary materials market (million tons)

Fibers	170
Ferrous metal	405
Non-ferrous metal	24
Plastics	5
Total	600 approx.

Opportunities from waste management

- Waste to energy – organic waste, non-recyclable plastic and paper – UNEP estimates that global potential of energy generation from waste agricultural biomass (crop residue assessed to be 140 billion tons) is about 50 billion tons of oil equivalent.
- Employment generation and economic development

Key questions for discussion

1. How to enhance the political support and make the policy framework more conducive to promote environmentally sound waste management?
2. How to enhance access to and availability of technologies for waste management particularly in the field of 3R and treatment/disposal of waste?
3. What are gaps in skills and capacities of human resources in developing countries and how to bridge these gaps?

Key questions for discussion

4. How to enhance access to finances for implementing environmentally sound waste management?
5. What are information gaps and how to bridge them?
6. How to curb illegal trans-boundary movement of waste particularly hazardous waste?
7. What are some specific issues on waste management and how to address them?

THANK YOU

For further information:
http://www.unep.or.jp

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