Session 8: Waste statistics

Reena Shah

United Nations Statistics Division

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Waste Statistics

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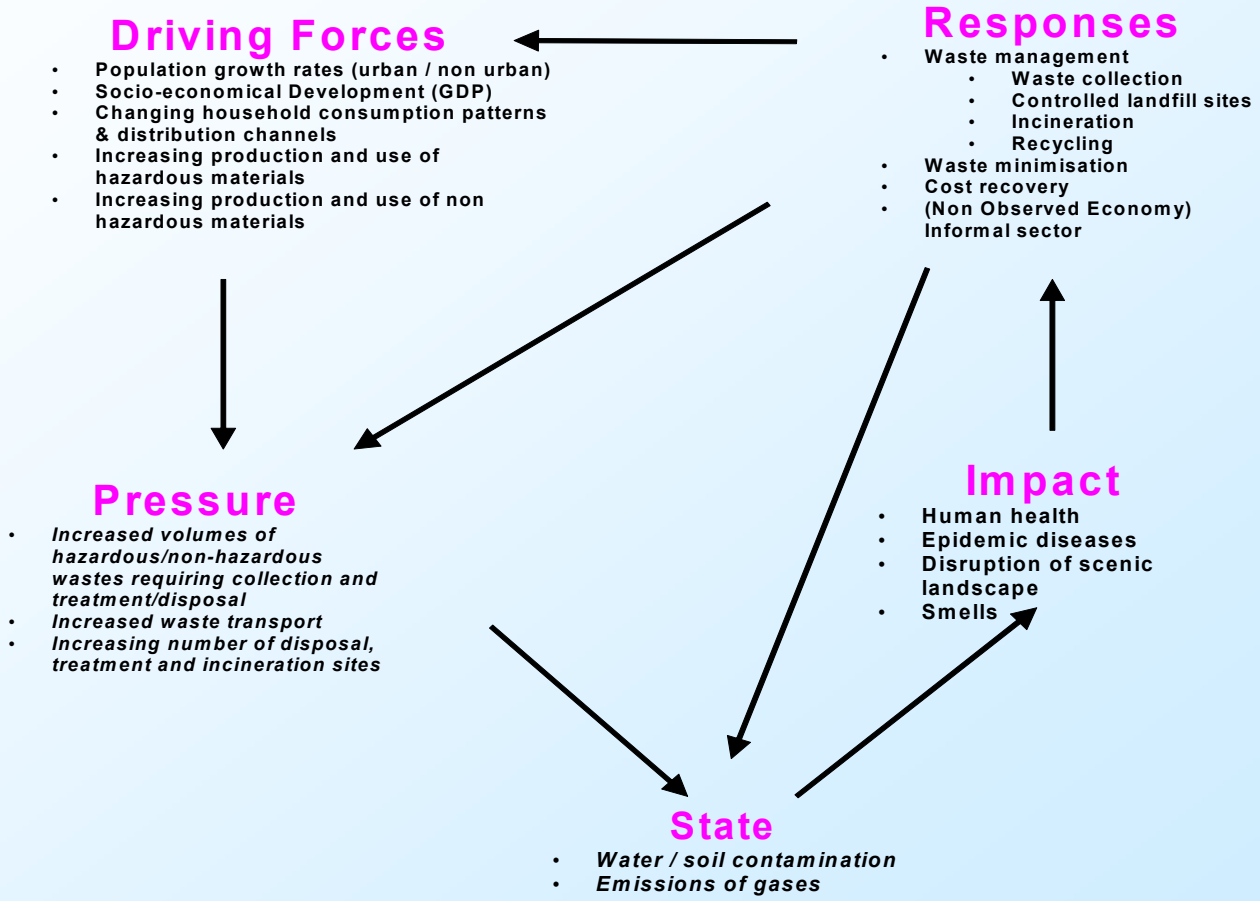
1. Environmental Impact of Waste



Driving Forces

- Population growth rates (especially urban)
- Socio-economic development (GDP)
- Changing household consumption patterns & distribution channels
- Increasing production and use of hazardous materials
- Increasing production and use of non hazardous materials

Pressure / State

- Increased volumes of hazardous/non-hazardous wastes requiring collection and treatment/disposal
- Increased waste transport
- Increasing number of disposal, treatment and incineration sites, adding competition for land use
- Water/soil contamination
- Emissions of gases

Impacts

- Human health
- Epidemic diseases
- Disruption of scenic landscapes
- Odours

Responses

- Waste collection
- Controlled landfill sites
- Incineration
- Recycling/reuse/composting
- Waste minimisation
- Cost recovery
- Informal sector (Non Observed Economy)

2. International Waste Indicators

(Commission of Sustainable Development)

Core Indicators

- Generation of Hazardous Waste
- Waste Treatment and Disposal

Other Indicators

- Generation of Waste
- Management of Radioactive Waste

3. African List of Environmental Indicators: Waste

Priority Areas	Agreed Set of ECA Regional Indicators
Development and population growth and urbanization	Generation of waste (CSD) Waste treatment and disposal (CSD) Municipal waste collected per capita (NOT AVAILABLE) Municipal waste collected as a % of the amount of waste generated (NOT AVAILABLE)
Appropriate and sound guidelines for waste management systems appropriate for the environmental conditions	% share of population served by municipal waste collection (NOT AVAILABLE)
Hazardous substances (as defined in the Basel Convention)	Generation of hazardous waste (CSD) Total hazardous waste imported (EECCA) Total hazardous waste exported (EECCA) Number and capacity of facilities for the disposal of hazardous waste (NOT AVAILABLE)

4. Waste Definition

- Materials that are not prime products (i.e. products produced for the market) for which the generator has no further use for his own purpose of production, transformation or consumption, and which he discards, or intends or is required to discard.
- It excludes residuals directly recycled or reused at the place of generation (i.e. establishment) and waste materials that are directly discharged into ambient water or air.

Approaches to waste classification

Activity-oriented breakdown

- For example according to the International Standard Industrial Classification of all Economic Activities (ISIC)

Material-oriented breakdown

- Paper, metal, glass, wood may come from various activities. However, a waste material, e.g. a solvent, can be produced from one activity only.

Ideal situation is the cross-classification of the two breakdowns

Waste Classifications

- Draft Economic Commission for Europe (ECE) standard statistical classification of wastes (1989)
- Regulation (EC) No 2150/2002 of the European Parliament and of the council of 25 November 2002 on waste statistics

5. Generation of Waste by Source (Table R1)

- Agriculture, forestry and fishing
- Mining and Quarrying
- Manufacturing
- Energy Supply
- Construction
- Other economic activities
- Households
- Total waste generation

Table R1: Generation of Waste by Source

Priority	Line	Category	Unit	1990		1995
	1	Agriculture, forestry and fishing (ISIC 01-03)	1000 t			
!	2	Mining and quarrying (ISIC 05-09)	1000 t			
!	3	Manufacturing (ISIC 10-33)	1000 t			
!	4	Energy supply (ISIC 35)	1000 t			
!	5	Construction (ISIC 41-43)	1000 t			
	6	Other economic activities (ISIC 36-39, 45-99)	1000 t			
!	7	Households	1000 t			
!	8	**Total waste generation (8 = 1+ ...+ 7)**	1000 t			

ISIC

- International Standard Industrial Classification of all Economic Activities - Rev. 4 (draft)
- Allows to link environmental pressure to economic activities

http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27

ISIC - Examples

- A (01-03) - Agriculture, forestry and fishing
- B (05-09) - Mining and quarrying
- C (10-33) - Manufacturing
- D (35) - Electricity, gas, steam and air conditioning supply
- E (36-39) - Water supply; sewerage, waste management and remediation activities
- F (41-43) - Construction

6. Management of Waste

Activities include:

- Collection, transport, treatment and disposal of waste
- Control, monitoring and regulation of the production, etc.
- Prevention of waste production through in-process modifications, reuse and recycling

7. Generation and Recycling of Selected Waste Materials

- Recycling materials
  - Paper, paperboard and paper products
  - Glass
  - Aluminium
  - Ferrous metal (including stainless steel)
  - Plastic
- Regulated materials
  - Construction/ Demolition waste
  - Sewage sludge (dry weight)
  - End- of life vehicles
  - Used tyres
  - Electric and electronic scrap
  - Other, specify

Table R2: Generation and Recycling of Selected Waste Materials

Line	Material	Category	Unit	1990		1995
1	Paper, paperboard and paper products	Waste generated	1000 t			
2		Waste collected for recycling	1000 t			
3	Glass	Waste generated	1000 t			
4		Waste collected for recycling	1000 t			
5	Aluminium	Waste generated	1000 t			
6		Waste collected for recycling	1000 t			
7	Ferrous metal (including stainless steel)	Waste generated	1000 t			
8		Waste collected for recycling	1000 t			
9	Plastic	Waste generated	1000 t			
10		Waste collected for recycling	1000 t			
11	Generation of other selected waste materials	Construction/Demolition waste	1000 t			
12		Sewage sludge (dry weight)	1000 t			
13		End-of life vehicles (a)	1000 t			
14		Used tyres	1000 t			
15		Electric and electronic scrap	1000 t			
16		Other, specify _____	1000 t			

8. Hazardous Waste

- Waste, that because of their chemical reactivity, toxic, explosive, corrosive, radioactive or other characteristics, cause danger, or are likely to cause danger, to health or the environment. Hazardous waste refers to the categories of waste to be controlled according to the Basel Convention on the control of transboundary movements of hazardous waste and their disposal.

Basel Convention

- Basel Convention on the control of transboundary movements of hazardous wastes and their disposal
- Adopted in Basel in March 1989
- Entered in force on 5 May 1992
- Today - 170 parties

http://www.basel.int/text/con-e-rev.pdf (English)

Table R3: Management of Hazardous Waste

- **Hazardous waste generated**
- Hazardous waste imported
- Hazardous waste exported
- **Hazardous waste managed in the country**

  of which: Recycled

  Incinerated

  Landfilled

  Other, specify

Table R3: Management of Hazardous Waste

Priority	Line	Category	Unit	1990		1995
!	1	**Hazardous waste generated (a)**	tonnes			
	2	Hazardous waste imported	tonnes			
	3	Hazardous waste exported	tonnes			
!	4	**Hazardous waste managed in the country** (4 = 1 + 2 - 3)	tonnes			
!	5	*Amounts going to:* Recycling	tonnes			
!	6	Incineration	tonnes			
!	7	Landfill	tonnes			
	8	Other, please specify in the footnote	tonnes			

Table R4: Data sources

- National inventory of hazardous waste producers
- Regular reporting by these producers
- National inventory of treatment facilities
- Regular reporting by these treatment facilities
- Reporting on import/export of hazardous waste

9. Municipal Waste

Waste collected by or on behalf of municipalities

- Includes waste originating from:
  - Households
  - Commerce and trade, small businesses
  - Office buildings, institutions (schools, hospitals, government buildings)
- Also includes:
  - Bulky waste (white goods, old furniture, mattresses)
  - Waste from selected municipal services
  - Waste from street cleaning services
- Excludes waste from
  - Municipal sewage network and treatment
  - Municipal construction and demolition waste.

Table R4a: Management of Municipal Waste

- Municipal waste collected from households
- Municipal waste collected from other origins
- **Total amount of municipal waste collected**
- **Municipal waste managed in the country**

  of which: Recycled
  Composted
  Incineration (with energy recovery)
  Landfill (controlled landfill)
- Percentage of total population served by municipal waste collection
- Urban population served by municipal waste collection
- Rural population served by municipal waste collection

Table R4a: Management of Municipal Waste

Priority	Line	Category	Unit	1990	
!	1	Municipal waste collected from households	1000 t		
	2	Municipal waste collected from other origins	1000 t		
	3	**Total amount of municipal waste collected (3 = 1 + 2)**	1000 t		
!	4	**Municipal waste managed in the country (a)**	1000 t		
!	5	*Amounts going to:* Recycling	1000 t		
!	6	Composting	1000 t		
!	7	Incineration	1000 t		
!	8	*of which:* with energy recovery	1000 t		
!	9	Landfill	1000 t		
!	10	*of which:* controlled landfill	1000 t		
	11	Other, please specify in the footnote	1000 t		
	12	Percentage of total population served by municipal waste collection	%		
	13	Percentage of urban population served by municipal waste collection	%		
	14	Percentage of rural population served by municipal waste collection	%		

Table R4a: Data sources I

Waste volumes:

- Municipalities: Contracts and accounts with transport companies and landfills
- Transport companies: Volume of waste transported, number of trucks used,…
- Landfills: Volumes/weight of waste or number of trucks
- Trade statistics for import/export of wastes

Table R4a: Data sources II

Population served:

- Municipalities: coverage of waste collection, population, …
- National statistics: rural and urban population

Table R4b: Composition of Municipal Waste

- Paper, paperboard
- Textiles
- Plastics
- Glass
- Metals
- Organic material

  of which: food and garden waste
- Other inorganic material

Table R4b: Composition of Municipal Waste

Line	Category	Unit	1990		1995
1	Paper, paperboard	%			
2	Textiles	%			
3	Plastics	%			
4	Glass	%			
5	Metals	%			
6	Organic material	%			
7	*of which*: food and garden waste	%			
8	Other inorganic material	%			
9	TOTAL	%	100		100

Table R4b: Data sources:

- Usually, the composition of municipal waste is determined from the physical analysis of waste samples using surveying methods.

Table R4c: Local Management of Municipal Waste

- Percentage of city population served by municipal waste collection
- Municipal waste collected from households
- Municipal waste collected from other origins
- **Total amount of municipal waste collected**

of which: Recycled
Composted
Incinerated
Landfilled

Table R4c: Local Management of Municipal Waste

Priority	Line	Category	Unit	1990		1995
!	1	Total population of the city	**1000 inh.**			
!	2	Percentage of city population served by municipal waste collection	%			
	3	Municipal waste collected from households	1000 t			
	4	Municipal waste collected from other origins	1000 t			
!	5	**Total amount of municipal waste collected (5 = 3 + 4)**	1000 t			
		Amounts going to:				
!	6	Recycling	1000 t			
!	7	Composting	1000 t			
!	8	Incineration	1000 t			
!	9	*of which:* with energy recovery	1000 t			
!	10	Landfill	1000 t			
!	11	*of which:* controlled landfill	1000 t			
	12	Other, please specify in the footnote	1000 t			

10. Waste Treatment and Disposal

- Waste treatment: physical, thermal, chemical or biological processes that change the characteristics of the waste in order to reduce its volume or hazardous nature, facilitate its handling or enhance recovery
- Waste disposal: waste management operation serving or carrying out the final treatment and disposal of waste (landfill, incineration, dumping at sea)

Table R5: Waste Treatment and Disposal Facilities

- Landfill sites
  - Controlled landfill
  - Uncontrolled landfill
- Incineration plants
  - with energy recovery
  - without energy recovery
- Composting plants
- Other waste treatment/disposal facilities

Table R5: Waste Treatment and Disposal Facilities

Priority	Line	Category	Unit	1990		1995
		Landfill sites:				
!	1	number	number			
!	2	annual inputs	1000 t			
		of which: controlled landfill				
	3	number	number			
	4	annual inputs	1000 t			
		of which: uncontrolled landfill				
	5	number	number			
	6	annual inputs	1000 t			
		Incineration plants:				
!	7	number	number			
!	8	annual capacity	1000 t			
		of which: with energy recovery				
	9	number	number			
	10	annual capacity	1000 t			
		of which: without energy recovery				
	11	number	number			
	12	annual capacity	1000 t			
		Composting plants:				
!	13	number	number			
!	14	annual capacity	1000 t			
		Other waste treatment/disposal facilities, please specify in the footnote:				
	15	number	number			
	16	annual capacity	1000 t			

Table R5: Data sources

- Municipal, regional or national inventory of waste treatment and disposal sites
- If necessary, additional information directly from the most important sites