Session 8: Waste statistics

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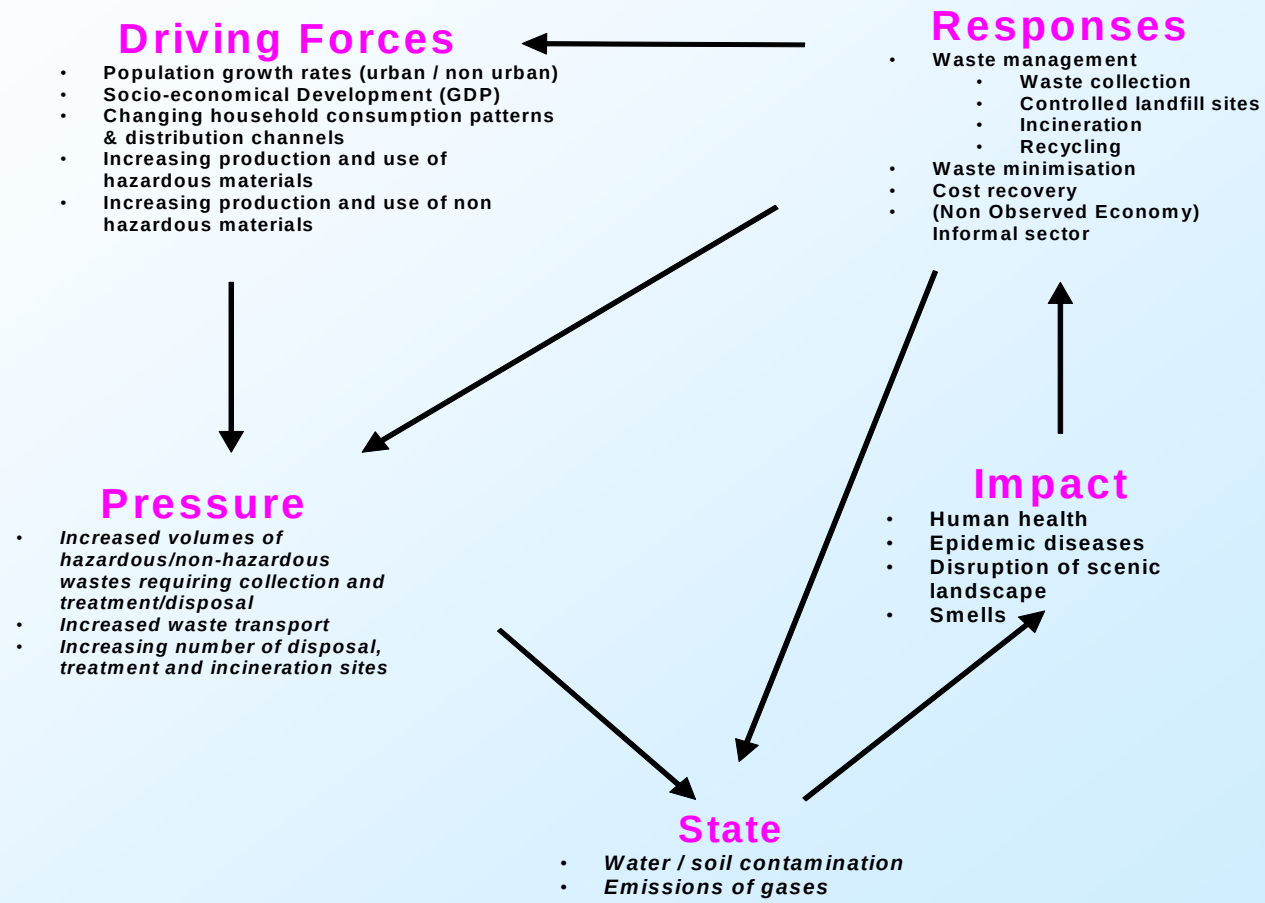
Waste Statistics

1. Environmental Impact of Waste
2. International Waste Indicators
3. Regional Waste Indicators
4. Waste Definitions and Classifications
5. Generation of Waste (R1)
6. Management of Waste
7. Municipal Waste (R2, R3, R6)
8. Hazardous Waste (R4)
9. Waste Treatment and Disposal (R5)

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
- Smells

Responses

- Waste collection
- Controlled landfill sites
- Incineration
- Recycling
- 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. Regional Waste Indicators

(Lead indicators - NEPAD/AEO-2 Themes-Issues Indicator-Data Matrix, May 2005)

- Solid waste collection by type (m^3, t) (industrial, domestic, medical, agricultural)
- Total hazardous waste generated
- (%) of population served by municipal waste collection
- (%) share of urban/rural population served by municipal waste collection
- Per capita waste collected (safe disposal)
- (%) of population with access to waste disposal service

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 Standards 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 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 Sector (Table R1)

- Agriculture and forestry
- Industrial activities: Mining and Quarrying, Manufacturing industries, Energy Production, Construction
- Other Activities
- Municipal Waste: households
- Total waste generation: hazardous waste

Table R1: Generation of Waste by Sector

Priority	Line	Category	Unit	1990		1995
	1	Agriculture and forestry (ISIC 01-02)	1000 t			
	2	Industrial activities	1000 t			
	3	*of which* : Mining and quarrying (ISIC 10-14)	1000 t			
	4	Manufacturing industries (ISIC 15-37)	1000 t			
	5	Energy production (ISIC 40)	1000 t			
	6	Construction (ISIC 45) (a)	1000 t			
	7	Other activities	1000 t			
	8	Municipal waste (b,c)	1000 t			
	9	*of which* : from households	1000 t			
!	10	**Total waste generation (10 = 1+2+7+8)**	1000 t			
	11	*of which:* hazardous waste (d)	tonnes			

ISIC

- International Standard Industrial Classification of all Economic Activities - Rev. 4
- 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. 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 R2: Management of Municipal Waste

- **Municipal waste collected**
- Municipal waste imported for treatment/disposal
- Municipal waste exported for treatment/disposal
- **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 R2: Management of Municipal Waste

Priority	Line	Category	Unit	1990		1995	
!	1	**Municipal waste collected** (a)	1000 t				
	2	Municipal waste imported for treatment/disposal	1000 t				
	3	Municipal waste exported for treatment/disposal	1000 t				
!	4	**Municipal waste managed in the country** (4 = 1 + 2 - 3)	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	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 R2: 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

Table R2: Data sources II

Population served:

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

Table R3: Composition of Municipal Waste

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

  of which: food and garden waste
- Other inorganic material

Table R3: Composition of Municipal Waste

Priority	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 3: Data sources:

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

Table R6: Selected Waste Variables at City Level

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

  of which: Recycled
  Composted
  Incinerated
  Landfilled

Table 6: Selected Waste Variables at City Level

Priority	Line	Category	Unit	1990		1995
!	1	Total population of the city	1000 inh.			
!	2	Persentage of city population served by municipal waste collection	%			
!	3	**Total amount of municipal waste generated (a)**	1000 t			
	4	Municipal waste collected from households	1000 t			
	5	Municipal waste collected from other origins	1000 t			
!	6	**Total amount of municipal waste collected (6 = 4 + 5) (a)**	1000 t			
!	7	*Amounts going to* : Recycling	1000 t			
!	8	Composting	1000 t			
!	9	Incineration	1000 t			
!	10	*of which:* with energy recovery	1000 t			
!	11	Landfill	1000 t			
!	12	*of which:* controlled landfill	1000 t			
	13	Other, please 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 R4: 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 R4: 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	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. 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

- Treatment plants
- Incineration plants
- Landfill sites (controlled)
- Other waste treatment/disposal facilities

Table R5: Waste Treatment and Disposal Facilities

Priority	Line	Category	Unit	1990		1995
!	1	**Treatment plants:** number	number			
!	2	annual capacity	1000 t			
!	3	**Incineration plants:** number	number			
!	4	annual capacity	1000 t			
	5	*of which:* with energy recovery number	number			
	6	annual capacity	1000 t			
!	7	**Landfill sites:** number	number			
!	8	annual inputs	1000 t			
	9	*of which* : controlled landfill number	number			
	10	annual inputs	1000 t			
	11	**Other waste treatment/disposal facilities, please specify:** number	number			
	12	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