



Session 2: Municipal Waste Generation and Management

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Management of Waste (Tables R2, R3, and R5)

Activities include:

- collection
- transport
- treatment and disposal of waste.



Municipal Waste (in R3, R4, and R5)

Municipal Waste: waste collected by or on behalf of municipalities, by public or private enterprises

- 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.



Municipal Waste (in R3, R4, and R5)

- **Municipal waste covers the waste that is collected and removed by municipal waste collection. It contains household and similar waste, the origin of which can be households... (see definition in previous slide).**
- **Household and similar waste can be generated by any economic activity, not only by households. Therefore, municipal waste removal also covers waste from different economic activities, not only from households.**



Treatment and Disposal of Waste

- Recycling: Any reprocessing of waste material in a production process that diverts it from the waste stream, except reuse as fuel. Both reprocessing as the same type of product, and for different purposes should be included. Recycling within industrial plants i.e., at the place of generation should be excluded.
- Composting: A biological process that submits biodegradable waste to anaerobic or aerobic decomposition, and that results in a product that is recovered and can be used to increase soil fertility.
- Incineration: The controlled combustion of waste with or without energy recovery.
- Landfilling: Final placement of waste into or onto the land in a controlled or uncontrolled way. The definition covers both landfilling in internal sites (i.e., where a generator of waste is carrying out its own waste disposal at the place of generation) and in external sites.



Management of Municipal Waste

- Municipal waste collected from households (1)
- Municipal waste collected from other origins (2)
- Total amount of municipal waste collected ($3=1+2$)
- Municipal waste imported/exported for treatment/disposal (4,5)
- Municipal waste managed in the country ($6=3+4-5$)
 - of which:* Recycled (7)
 - Composted (8)
 - Incinerated (9)
 - Landfilled (11)
 - Other (13)
- Total population served by municipal waste collection (14)
- Urban population served by municipal waste collection (15)
- Rural population served by municipal waste collection (16)



Table R3: Management of Municipal Waste

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 (=1+2)	1000 t	
4	Municipal waste imported for treatment/disposal	1000 t	
5	Municipal waste exported for treatment/disposal	1000 t	
6	Municipal waste managed in the country (=3+4-5)	1000 t	
7	<i>Amounts going to:</i> Recycling	1000 t	
8	Composting	1000 t	
9	Incineration	1000 t	
10	<i>of which:</i> with energy recovery	1000 t	
11	Landfilling	1000 t	
12	<i>of which:</i> controlled landfilling	1000 t	
13	Other, please specify in the footnote	1000 t	
14	Total population served by municipal waste collection	%	
15	Urban population served by municipal waste collection	%	
16	Rural population served by municipal waste collection	%	



Table R3: Data Validation and Main Issues

- Compare “municipal waste collected from households” (R3, line 1) with “generation of waste by households” in R1, line 7. $R3, \text{ line } 1 \leq R1, \text{ line } 7$.
- If $R1, \text{ line } 7 = R3, \text{ line } 1$ then $R3, \text{ line } 14$ (total population served by municipal waste collection) = 100%.
- Municipal waste collected per capita should be within reasonable range (100 - 1000 kg per capita).
- The relationship between Total, Urban, and Rural population served by municipal waste collection is normally: $P_{\text{rural}} < P_{\text{total}} < P_{\text{urban}}$



Table R3: Data sources

Waste amounts:

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

Population served:

- Municipalities: coverage of waste collection, population, etc.
- National statistics: rural and urban population
- Population and housing censuses



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Thank you.

Any questions?