Lusaka Clean City Project

LISWMC Continuous Professional Development Programme

Where are we now?

20 June 2025

JICA Expert Team

1st session:
Where are we now?

1. Basics of Municipal Solid Waste Management
2. What is the Waste Flow? What does the Waste Flow tell you?
3. How do we get the Waste Stream?
4. Financial Situation

2nd session: Where do we want go?
3rd session: How do we get there?

Basics of municipal solid waste management

2-1 The definition of municipal solid waste

Municipal solid waste is generally understood as "wastes generated by households and wastes that have common properties with household wastes" (European Commission, 2016). In reality, however, the kind of waste included or not included in municipal solid waste differs by country and city. Municipal solid waste is defined as "waste other than industrial waste" by the Waste Management and Public Cleansing Act in Japan. Other individual cities may apply different categorisations.

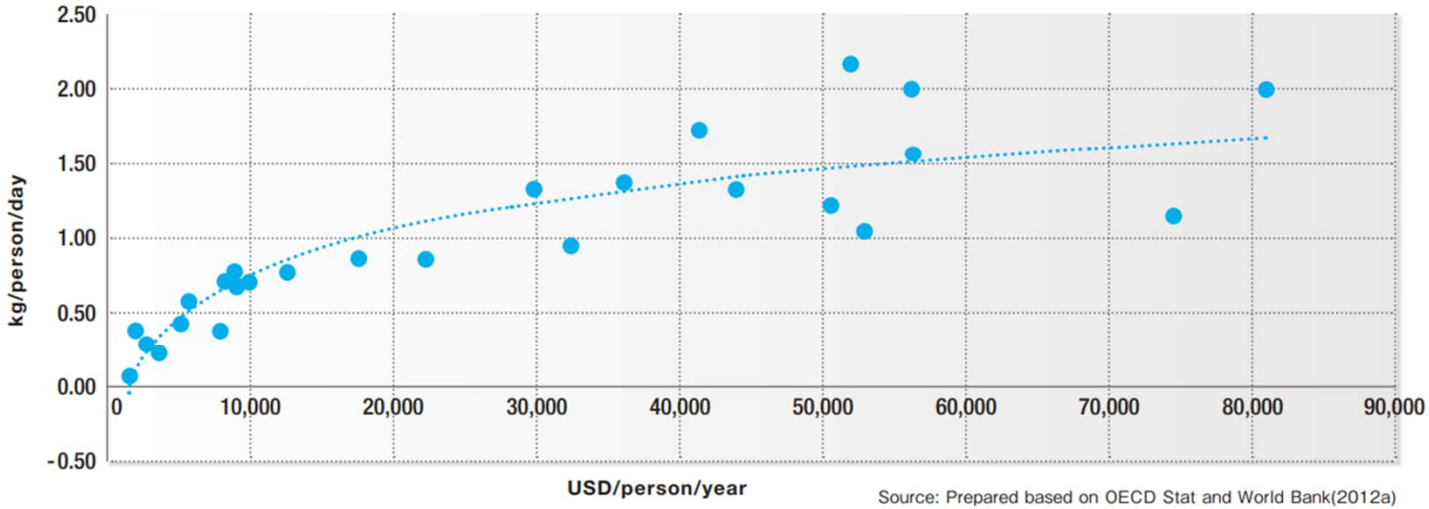
What are the municipal wastes in Lusaka?

- Household waste
- Institutional waste
- Commercial waste
- Industrial waste
- Hospital waste
- E-waste
- End of vehicles
- Bulky waste
- Construction waste
- Food waste
- Agricultural waste
- Non-hazardous waste
- Hazardous waste
  - Chemical waste
  - Infectious waste
  - Radioactive waste
  - Oils

Basics of municipal solid waste management

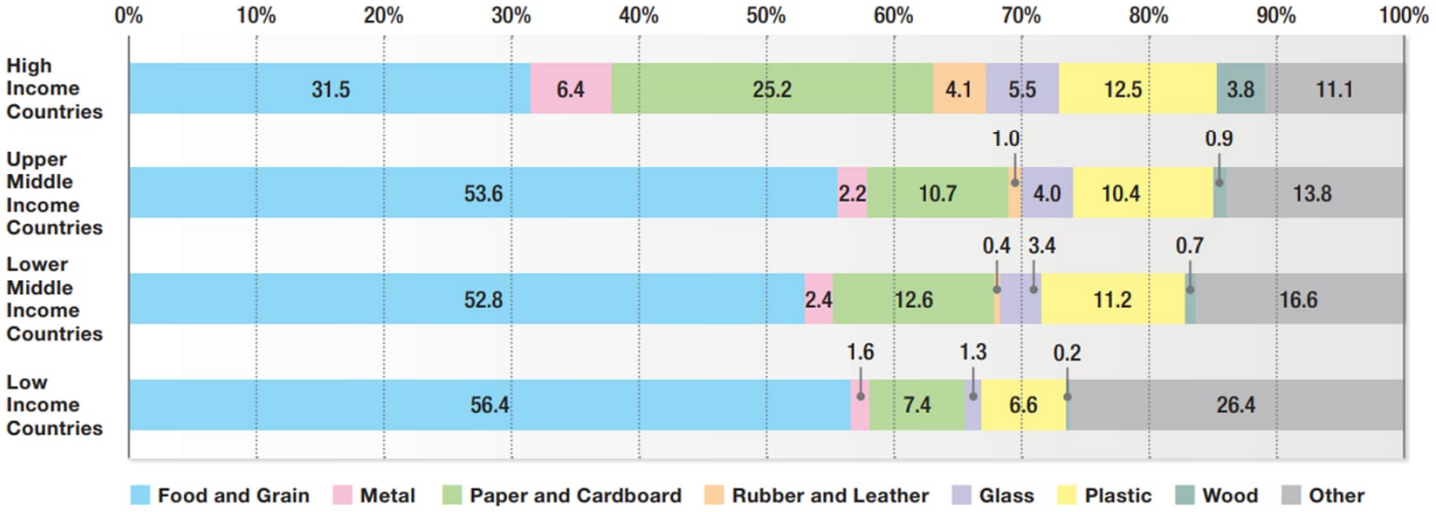
The waste generation rate and composition are characterised by the economic situation.

Per capita GDP and municipal solid waste amount



Source: Prepared based on OECD Stat and World Bank(2012a)

Waste type and income level of country



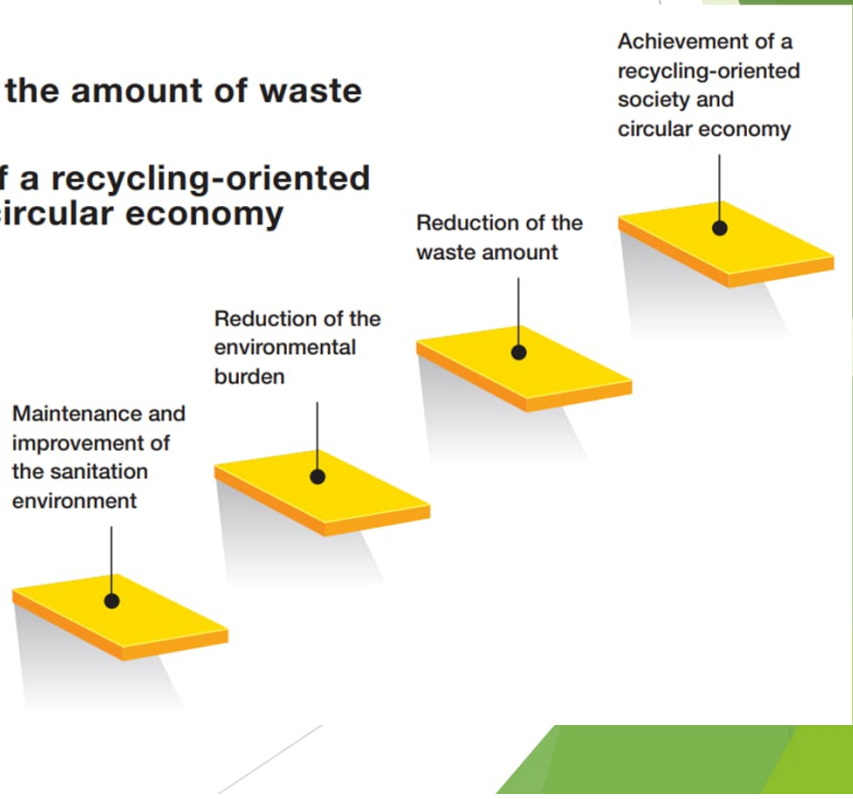
Source: Prepared based on World Bank (2018), p28

Basics of municipal solid waste management

3-1 The objectives of municipal solid waste management

Although the objectives of municipal solid waste management differ depending on the stage of development and conditions of a city, they generally include the following:

1. **Maintenance and improvement of the sanitation environment**
2. **Reduction of the environmental burden**
3. **Reduction of the amount of waste**
4. **Realisation of a recycling-oriented society and circular economy**



Waste Flow

What is the Waste Flow?

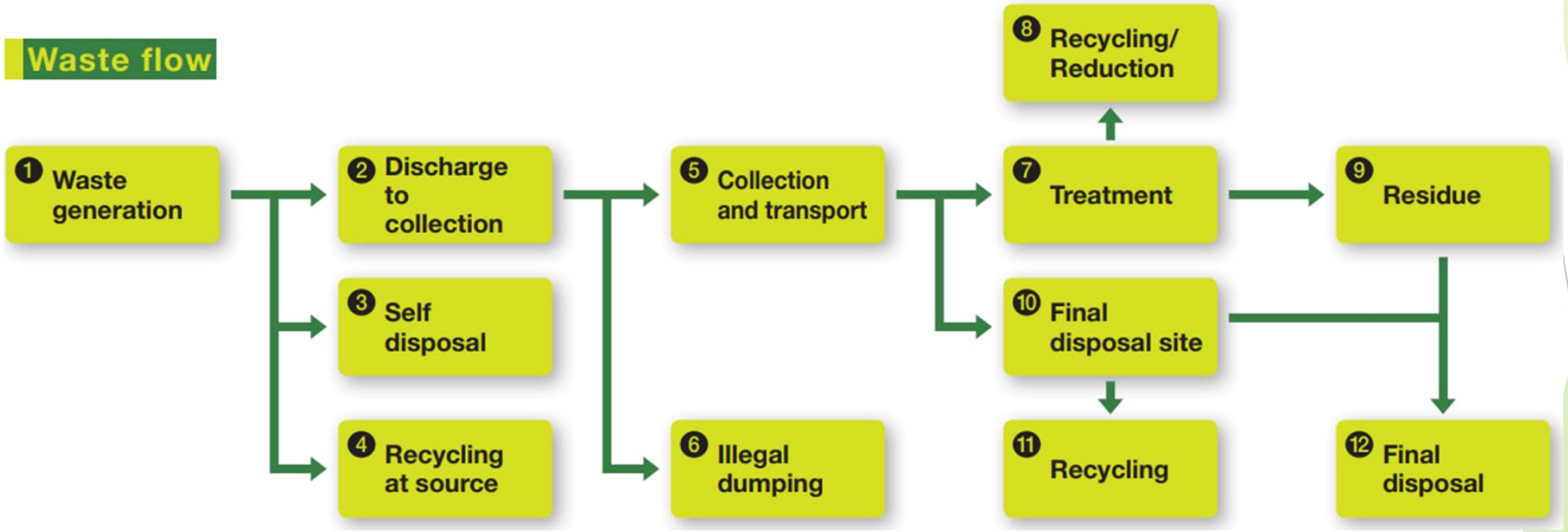
3-2 Waste flow

Materials or goods basically become ‘waste’ when they are no longer needed by their owners. From there, the waste goes through the stages of storage, discharge, collection, transport, treatment, and final disposal. This process is called the waste flow.

Waste management is a process of arranging human resources, materials, and financial capital to ensure that each stage is handled properly in order to achieve the overall waste management objectives.

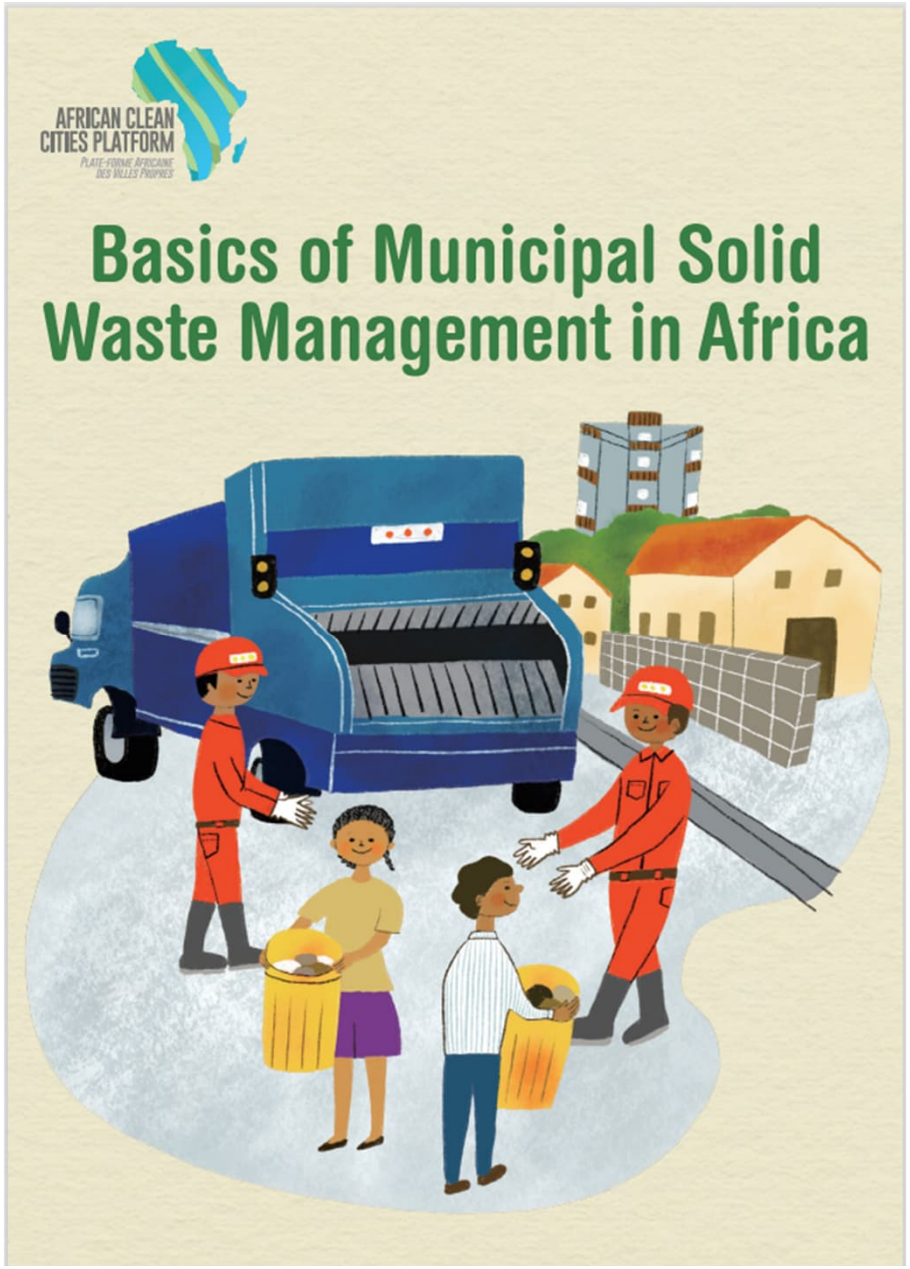
Waste Flow

What does the Waste Flow tell you?



- Waste amount at each stage
- Collection rate
- Recycling rate
- Final disposal rate

- Strength and Weakness
- Cost and Revenue
- Priority order for improvement
- Right decision making



https://www.africancleancities.org/node/50

How do we get the waste flow?

1. Waste Amount Survey
   - Waste generation rate (waste generation amount per capita)
2. Public Opinion Survey
   - Collection rate
   - Recycling at home
   - Rates of self disposal (home-composting, bury, burn, etc.)
3. Recycling Survey
   - Amount of recycled
4. Weighbridge Data Survey
   - Waste disposal amount

Results of the Surveys

- Estimation of Waste Generation Rate -

According to the waste amount survey, the average household waste generation per person was 0.49 kg/person/day for the high-income group, 0.59 kg/person/day for the middle-income group, and 0.49 kg/person/day for the low-income group. These figures were weighted by economic class population ratios to obtain an average household waste generation rate of 0.53 kg/person/day for Lusaka City residents. Furthermore, assuming a 7:3 ratio of household waste to commercial waste in municipal waste, the average municipal waste generation rate per resident was calculated as 0.76 kg/person/day. Further investigation is recommended to improve the accuracy of the results.

Table: Estimated Waste Generation Rate

Category	Percentage (%)	Kg/person/day
Households	70	0.53
Businesses	30	0.23
Municipal waste	100	0.76

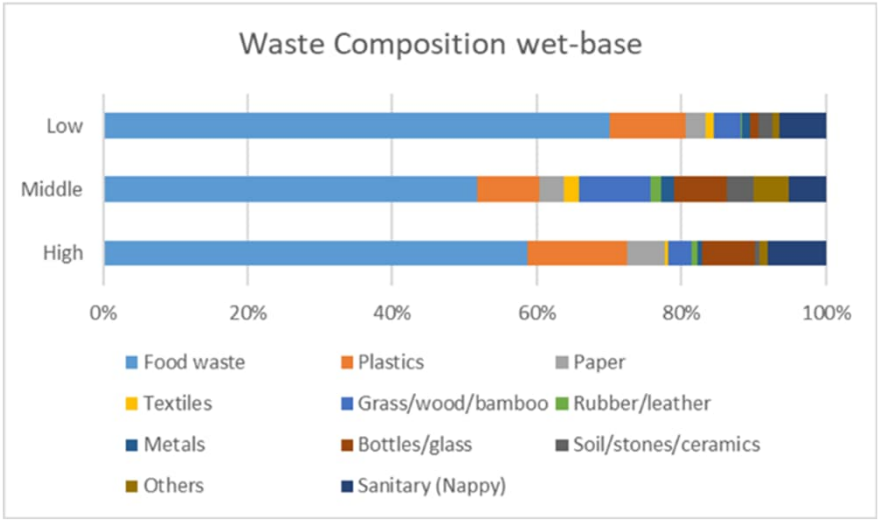
Municipal waste = Households waste + Business waste

Results of the Surveys

- Waste Composition -

Food waste exceeded 50% in all economic classes, with low-income households showing the highest rate at approximately 70%. Plastic accounted for approximately 15% in high-income households and approximately 10% in middle- and low-income households. Disposable nappies accounted for a significant proportion (5-8%) in all economic classes.

Figure: Waste Composition (wet-base) by income level



Results of the Surveys

- Public Opinion Survey -

A survey was conducted to assess residents' awareness of waste management in urban and peri-urban areas, which differ significantly in terms of economic conditions and infrastructure.

- Is the waste problem?
  - In urban areas, awareness remained at just over 10%, whereas in peri-urban areas, waste was perceived as the most serious problem alongside drainage, with approximately 25% of people citing it as such.
- Are you subscribed to the waste collection service?
  - In urban areas, 86% of people use collection services, whereas in peri-urban areas, this figure is 55%. Less than 1% of people in urban areas use illegal operators despite knowing they are illegal, whereas 61% of people in peri-urban areas use illegal operators despite knowing they are illegal.
- Recycling
  - 34% of people in urban areas and 27% of people in peri-urban areas reported sorting recyclable waste. Among these respondents, 63% in urban areas reported handing waste over to the informal sector, while 48% in peri-urban areas reported burning it.
- Home composting
  - 31% of people in urban areas and 10% of people in peri-urban areas reported composting. Additionally, all households that answered 'Yes' reported using the compost for vegetable gardening or other gardening activities at home.

Results of the Surveys

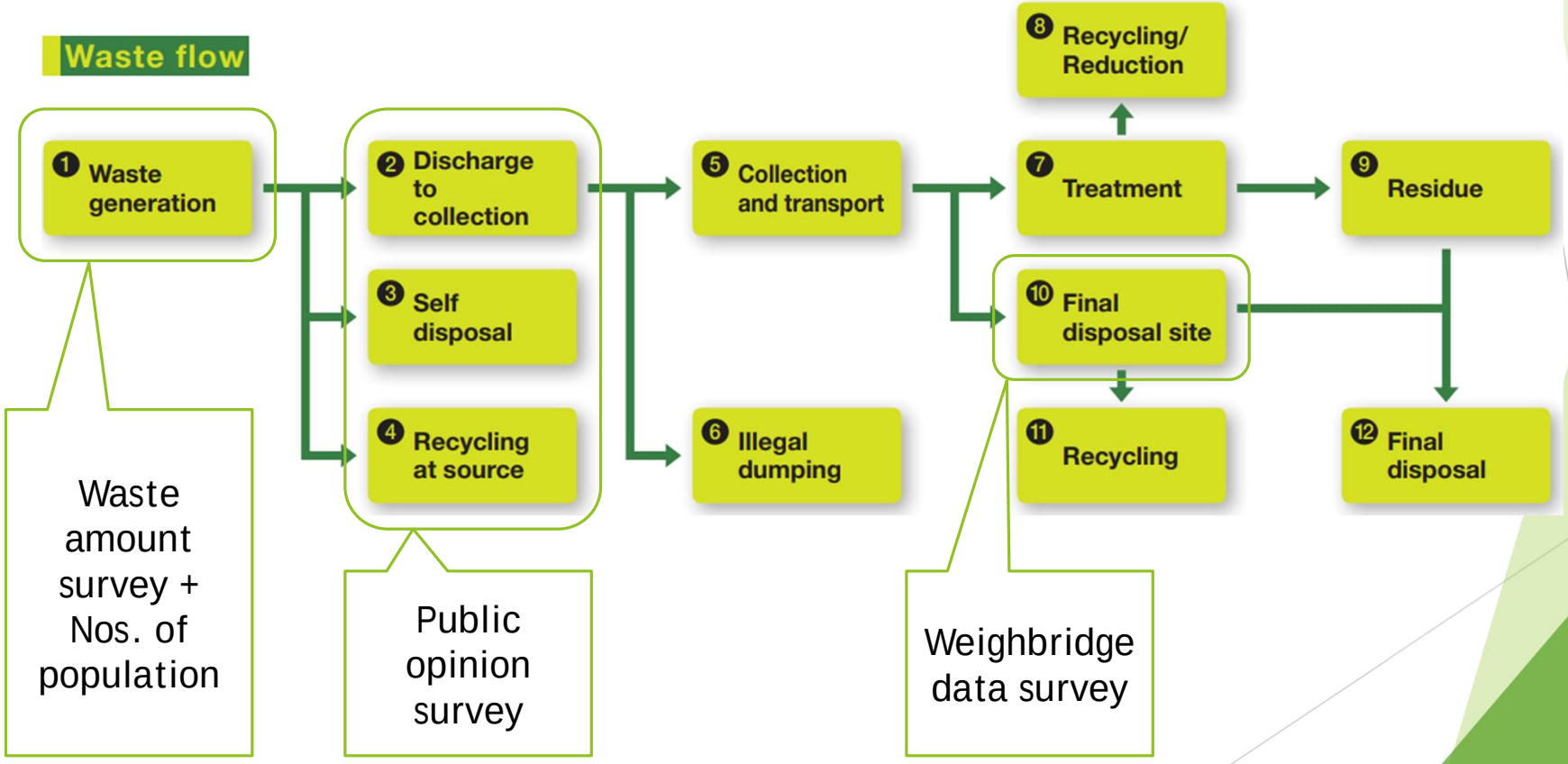
- Disposed Waste Amount -

- The weighbridge data at the Chunga Landfill was analysed. The results are shown in the table below. A total of 338 tonnes of waste was delivered daily. The breakdown was as follows: CBE (Community Based Enterprise), FC (Franchise Company), and LCC (Lusaka City Council) each accounted for approximately 30%, and Private accounted for 10%.

Table: Amount of Waste Disposed at Chunga

Item	ton/year	ton/day	%
CBE	32,491	89	26%
FC	41,869	115	34%
LCC	35,356	97	29%
Private	13,456	37	11%
Total	123,172	338	100%

How do we get the waste flow?



Results of the Surveys

- Waste Flow in 2023-

- The current waste flow was estimated using data from Waste Amount and Composition Survey, Public Opinion Survey, and Weighbridge Data at Chunga Landfill. Total waste generation was estimated at 1,667 tonnes per day. Of this, 244 tonnes per day were self-disposal at source (including recycling), 1,423 tonnes per day were disposed of, 1,023 tonnes per day were collected, and 338 tonnes per day were disposed of at Chunga Landfill. Destination of 1,085 tonnes per day of waste is unknown.
- This high volume of unknown waste is estimated to include waste that has been illegally dumped in unauthorised sites or waterways within the city, as well as waste that has been disposed of at Chunga Landfill outside of operating hours or by vehicles that did not pass through the weighbridge.

Figure: Estimated Waste Flow

Collection rate = 1023/1423 = 72%

Final disposal rate = 338/1423 = 24%

Financial Status

LUSAKA INTEGRATED SOLID WASTE MANAGEMENT COMPANY SUMMARY OF REVENUE AND EXPENDITURE YEAR ENDED 2024

DETAILS	APPROVED BUDGET 2024	ADJUSTED BUDGET 2024	ACTUAL CUMMULATIVE JANUARY 2024 - DECEMBER 2024	PERCENTAGE
Fees and Charges				
Annual Franchise Fees	1,944,000.00	1,944,000.00	177,198.96	9
Tipping Fees franchise companies,CBEs and Privaste como	4,618,892.00	4,618,892.00	3,969,700.87	86
Skip Bins/Containers Collection & Bin Rentals	955,200.00	955,200.00	646,366.11	68
Special Waste	107,040.00	107,040.00	402,243.11	376
Penalty Fees (Illigal Waste Disposal)	300,000.00	300,000.00	182,750.00	61
Central Business District- CBD (Collection Fees)	22,874,400.00	22,874,400.00	2,573,366.00	11
Bidding Documents for Franchise Contractors	-	-	1,000.00	-
Transportation licence for self service Solid Waste Provider/Recyclying Licence	-	-	42,500.00	-
Garbage Collection Fees- Markets/Bus Stations	-	-	1,210,312.40	-
Garbage Collection Fees- BH market	-	-	29,302.00	-
Sub Total	**30,799,532.00**	**30,799,532.00**	**9,234,739.45**	**30**
Assistance/Grant from LGRD	10,000,000.00	10,000,000.00	6,833,334.34	68
Special grant (Cholera Relief Funds)			100,000.00	-
Sub Total	**10,000,000.00**	**10,000,000.00**	**6,933,334.34**	**69**
Grand Total Income	**40,799,532.00**	**40,799,532.00**	**16,168,073.79**	**40**

Financial Status

LUSAKA INTEGRATED SOLID WASTE MANAGEMENT COMPANY SUMMARY OF REVENUE AND EXPENDITURE YEAR ENDED 2024

DETAILS	APPROVED BUDGET 2024	ADJUSTED BUDGET 2024	ACTUAL CUMMULATIVE JANUARY 2024 - DECEMBER 2024	PERCENTAGE
EXPENSES				
Personal Emoluments	11,466,235.00	8,120,300.48	1,199,295.16	15
Statutory Contributions	417,877.00	417,877.00	37,263.37	9
Office materials and utility Expenses	1,086,070.00	1,086,070.00	695,619.78	64
Building, Repair and Maitence cost	408,841.00	408,841.00	784,626.70	192
Petrol ,Oil and Lubricants	11,401,700.00	11,523,939.96	5,924,228.25	51
Servicing (Other consumables)	2,176,494.00	2,723,732.95	1,656,085.74	61
Spare parts	410,000.00	410,000.00	166,630.23	41
Tyres	2,982,000.00	3,639,761.05	602,275.00	17
Repairs	2,020,000.00	2,885,000.00	278,190.81	10
Insurance	659,157.00	984,591.52	502,353.85	51
Hire of plant and equipment/Motor vehicle			398,200.00	-
Administrative Operating costs	4,814,610.00	5,314,610.00	1,372,507.07	26
Public functions and ceremonies	451,084.00	451,084.00	165,837.60	37
Travel expenses outside Zambia	250,000.00	250,000.00	-	-
Trainning ,Workshops,Seminars and Conferences	515,000.00	515,000.00	11,730.00	2
Electronic and Electrical Equipment(Solar)	-	150,000.00	186,850.00	125
Office equipment	982,000.00	982,000.00	74,050.00	8
Computer Software	758,464.00	758,464.00	153,093.60	20
Grand total- expenses	**40,799,532.00**	**40,621,271.96**	**14,208,837.16**	**35**
Surplus			**1,959,236.63**	

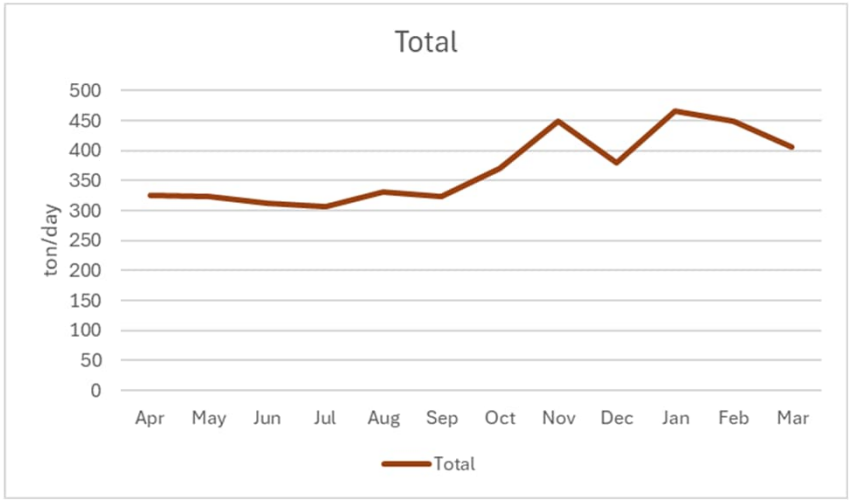
Weighbridge data, from Apr. 2024 – Mar. 2025

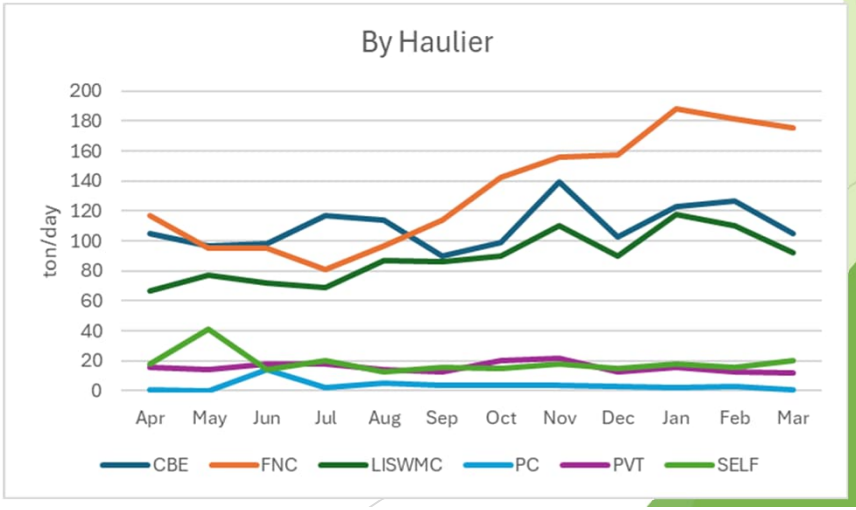
Unit: ton

	2024									2025			
Customer	4	5	6	7	8	9	10	11	12	1	2	3	Total
CBE	3148	3015	2930	3635	3535	2705	3082	4176	3180	3822	3542	3270	40,040
FNC	3523	2953	2860	2503	3020	3420	4417	4688	4860	5823	5058	5420	48,545
LISWMC	2021	2377	2162	2154	2694	2583	2805	3306	2789	3657	3091	2865	32,504
PC	32	0	422	61	154	131	115	134	94	77	75	27	1,322
PVT	468	427	543	556	434	392	618	652	396	482	359	374	5,701
SELF	547	1273	433	621	415	474	464	525	474	553	454	607	6,840
Total	9740	10045	9350	9530	10252	9705	11500	13481	11793	14413	12580	12563	134,952

Unit: ton/day

Customer	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
CBE	105	97	98	117	114	90	99	139	103	123	127	105
FNC	117	95	95	81	97	114	142	156	157	188	181	175
LISWMC	67	77	72	69	87	86	90	110	90	118	110	92
PC	1	0	14	2	5	4	4	4	3	2	3	1
PVT	16	14	18	18	14	13	20	22	13	16	13	12
SELF	18	41	14	20	13	16	15	18	15	18	16	20
Total	325	324	312	307	331	324	371	449	380	465	449	405





Starting point of financial analysis of LISWMC

Total revenue in 2024 = 16,168,073.79 KMW
Disposal amount from Apr. 2024 – Mar. 2025 = 134,952 ton
Revenue per ton of waste is approximately 120 KMW / ton

Total expenditure in 2024 = 14,208,837.16 KMW
Disposal amount from Apr. 2024 – Mar. 2025 = 134,952 ton
Expenditure per ton of waste is approximately 105 KMW / ton

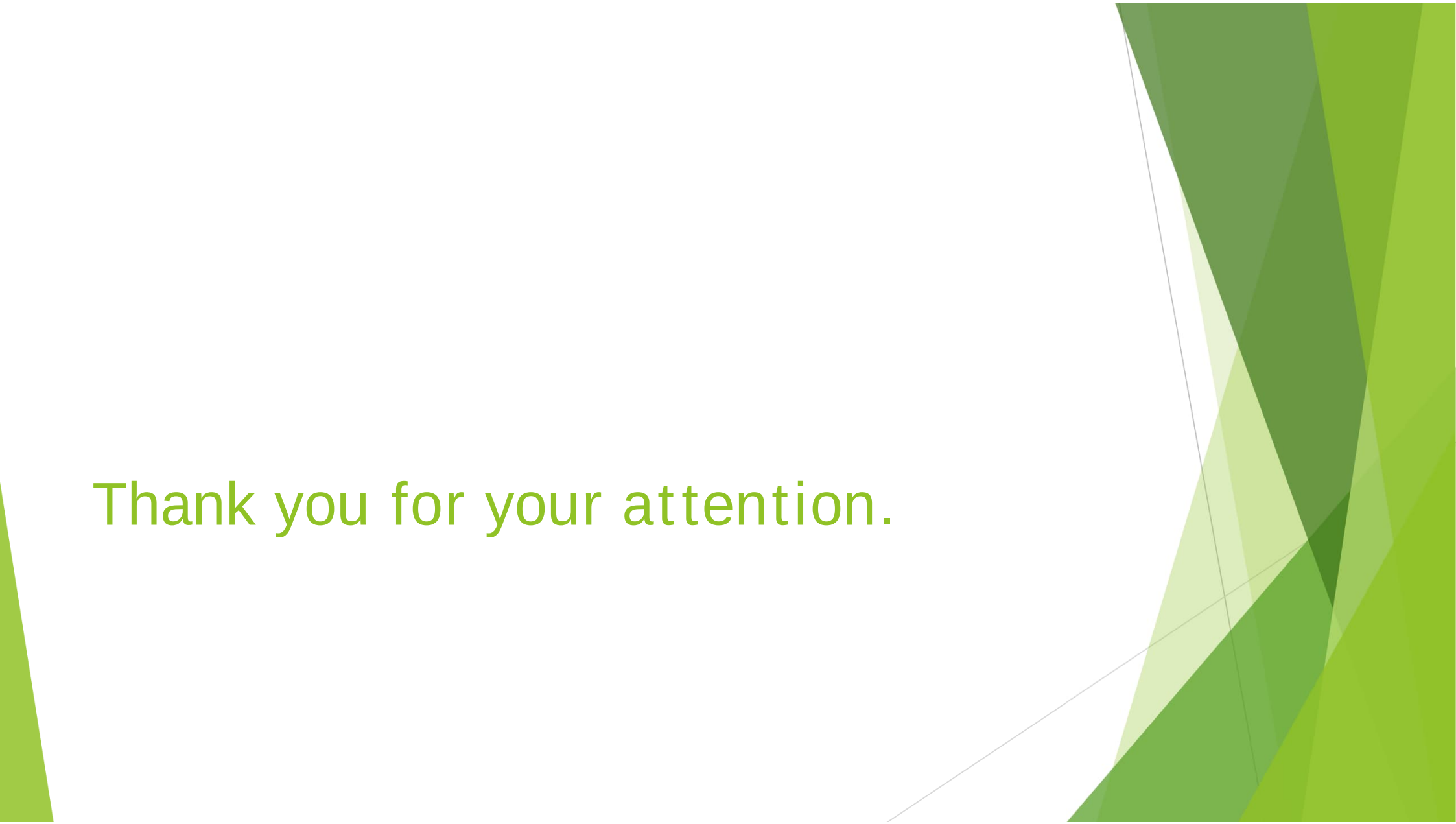
Next step is to realize Cost Accounting.

- How much are we spending for collection service?
- How much are we spending for final disposal?
- How much are we spending contract management? etc.

Summary of the 1st session

- While there is a general understanding of what municipal solid waste comprises, there are differences depending on the city or country in question.
- The generation and composition of waste are characterised by the economic situation.
- Waste management develops in stages.
- Waste flow analysis reveals the current state of municipal solid waste management.
- Estimates of waste flow can be obtained through surveys of waste amounts, public opinion (questionnaires), recycling and weighbridge data.
- A waste generation rate of 0.76 kg per person per day was obtained through a waste amount survey in 2023. However, further investigation is recommended to improve the accuracy of the results.
- The current waste flow indicates that there is a significant amount of unaccounted waste and that only 24% is disposed of at the official landfill site in Chunga.
- There are significant discrepancies between the planned budget and actual performance.
- It is important to establish a cost accounting system to evaluate the current waste management financially.

Thank you for your attention.



2nd session:
Where do we want go?

1. LISWMC's overall objectives
   - General objectives of Solid Waste Management
2. Achievement of 60% waste disposal at Chunga
3. Finance
   1. Cross-subsidy

3rd session
How do we get there (1)?
Required capabilities to archive the goals

- Collection and Transport
  - Contract management: Urban (FC), Peri-urban (CBE)
  - LISWMC's service delivery: CBD, Municipal markets, Bus stations
  - Clean-up clandestine dumping: Who is responsible, LCC or LISWMC?
- Recycling and Intermediate Treatment
  - Encouragement of establishment and operation of drop-off centres by the private sectors
  - Encouragement of home composting
  - Evaluation of WTE technology
- Final Disposal
  - Continuous efficient daily operation
  - Development of new cells

3rd session
- How do we get there (2)? –
Required capabilities to archive the goals

- Service User Communication
  - Ensuring payment and client (subscription) expansion
  - Complaint handling
  - Publicizing LISWMC and other SWM related bodies and activities
- Business Management
  - Data management:
    - Service user data (contracts, payments, complaints, etc.)
    - Waste amount at Chunga
    - Accounting data, revenues and costs
    - Integration of the above data

3rd session
How do we get there (3)?
Required capabilities to archive the goals

- Business Management, cont.
  - Financial Management:
    - Cost accounting, Invoicing
    - Collection of unpaid money
    - Preparation of financial report, Balance Sheet, Profit and Loss, Cashflow, etc.
    - Planning of budget
  - Human Resource Management
    - Maximizing employees' performance through recruitment, performance management, compensation, and employee relations
  - Top Management
    - Strategic decision-making, overall leadership, setting the direction for the company, building relationships with external organisaions

- Prioritize
  - Management and Operation Plan: annual review
  - Lusaka Solid Waste Management Improvement Plan