

Solid waste management practices in Addis Ababa

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1. Background

➤ Ethiopia

- East African nation
- Population = about 120 million
- Areal size = 1.104 million km²
- Economy:
 - One of Low income countries
 - Dominated by agriculture
 - Fast expansion of urbanization

Background . . .

➤ Addis Ababa

- Capital of Ethiopia
- Areal size = 530.14 km²
- Population
 - about 5,228,000
 - **Density = more than 5,165.1 square km²**
- **Elevation = 2050 - 3355 meters above sea level**
- Political and economic center of the nation
- Seat of African Union
- Diplomatic hub

Background . . .

- Addis Ababa government
 - Mayor and its Cabinet – Executive
 - Speaker and city council – legislature
 - Administrative division
 - 11 Sub-Cities (the second administrative stratum)
 - 119 Woredas (the third administrative stratum)

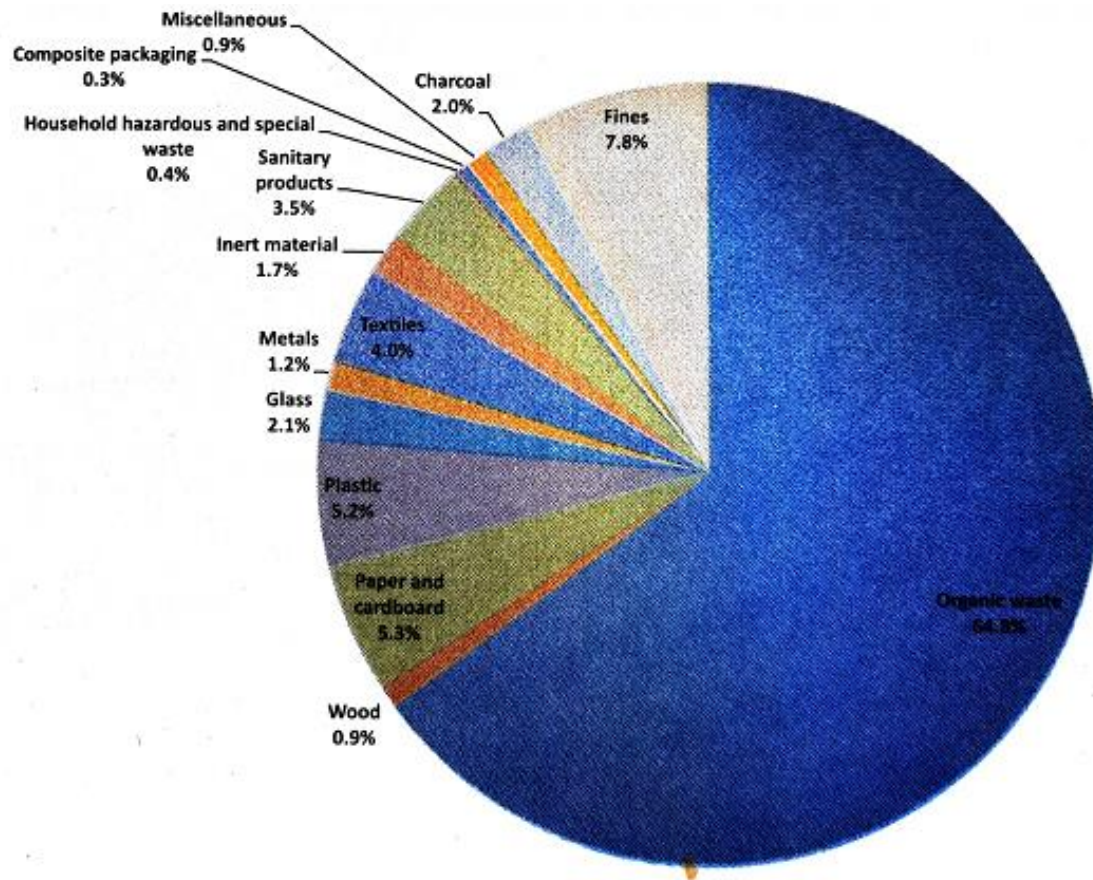
- Different departments are engagement in solid waste management
 - Addis Ababa Solid Waste Management Agency – implementer
 - Addis Ababa Beautification and cleansing Authority - implementer
 - Addis Ababa Environmental Protection Authority – regulatory
 - **Solid Waste Recycling& Disposal Project Office**

Background . . .

- Municipal solid waste generation rate
 - NOR consult, 1981 = 0.15 kg/cap/day
 - Gordon , 1995 = 0.252 kg/cap/day
 - IGNIS, 2012 = 0.34 kg/cap/day
 - Projected, 2022 = 0.45 kg/cap/day
- Total Municipal solid waste generation rate
 - Current daily [estimated] = 2,350 tons
 - Annual [estimated] = 858,000 tons

Background . . .

➤ Municipal solid waste characteristics



2. Solid waste management proclamation

- Federal government proclamation No. 513/2007
 - Objective of the proclamation (article 3)
 - To enhance all levels of capacities to prevent the possible adverse impacts of solid waste on environment
 - To Create economically and socially beneficial assets out of solid wastes
 - General obligations of urban administration (article 4)
 - Urban administration shall create enabling conditions to promote investment on the provision of solid waste management services

Proclamation . . .

- Inter-regional movement of solid wastes (Article 6)
 - Solid waste may be transported from one Regional State or urban administration to an other regional state only if the recipient Region State or urban administration has notified the sender in writing of its capacity to recycle or dispose of it in an environmentally sound manner
- Plastic bags (Article 8)
 - As of the date fixed under a directive to be issued by authority, it has be unlawful to put on the market any plastic bag that is not labeled to how whether it is biodegradable or not

Proclamation . . .

- Management of Household Solid wastes (Article 11)
 - Each household shall ensure that recyclable solids are segregated from those that destined for final disposal and are taken to collection site designated for such wastes
- Civil Liability (Article 16)
 - The owner of any solid waste disposal site shall regardless of fault, be liable for any damage caused to the environment, human health or property in the courses of its operation and after its closure

3. Solid waste management actors

➤ Formal actors

- Addis Ababa solid waste management agency
- Sub-city solid waste management offices
- Woreda solid waste management offices
- Pre-collectors
- Private enterprises

➤ Informal actors

- Qurales
- Scavengers
- Middle men
- Informal recyclers

SWM actors . . .

- **Formal Responsibilities of Addis Ababa solid waste management agency**
 - direct, control and coordinate city wide solid waste management works;
 - carry out educational and awareness creation activities at different levels;
 - establish and cause the implementation of effective and customer oriented procedure to enable the collection, transportation, reuse/recycling, recovery and disposal of solid wastes;
 - Implement ISWM through modern technology transfer.

SWM actors . . .

- **Sub-city solid waste management office**
 - Responsible for secondary collection and
 - Manage transportation of wastes to disposal site
 - **Finance**
 - operation and maintenance of solid waste collection and transportation trucks
 - staffs working in the transport services

SWM actors . . .

➤ **Woreda solid waste management office**

- Smallest administrative unit in solid management office
- Responsible in organized and supporting primary solid waste collection
- Register waste collected by pre-collectors
- Pay compensation for pre-collectors based on the volume of waste they collected
- **Current payment rate/m³ = 1.5 USD**

SWM actors . . .

➤ Pre-collectors

- Private associations operating under private-public partnership scheme
- Perform primary collection by collecting door to door from households
- Undertake limited level of sorting solid wastes they collected from households
- Transport collected solid waste by push-carts to containers at transfer points

SWM actors . . .

➤ Households

- store solid waste they generated in sack or plastic bags
- carry out [Limited] Sorting solid wastes generated at their home
- pay for the service they receive from pre-collectors through the water tariff
- Payment rate by high income and low income households are proportional to their water consumption
- **Rate:**

SWM actors . . .

➤ **Private enterprises**

- Solid waste collection and transport service providers
- Collects institutional and street sweeping solid wastes
- Contracted by AAWSA or institutions
- Engaged in limited sorting of mixed solid waste collected by from institutions

SWM actors . . .

➤ Formal recyclers

- Companies use metal scraps, broken glasses and plastic wastes as inputs in their production
- Receive from middlemen collecting from kurales (informal recycling material collecting individuals)

SWM actors . . .

➤ Qurales

- Informal individual engaged in collection of reusable and recyclable materials from households and scavengers
- Buy the materials by negotiation
- Got their name from “Qorkoro Yalew” – literally means “do you have tins or metals?”
- Expanded their collection to plastics, rubber, bottles, woods, worn out shoes, clothes, etc.

SWM actors . . .

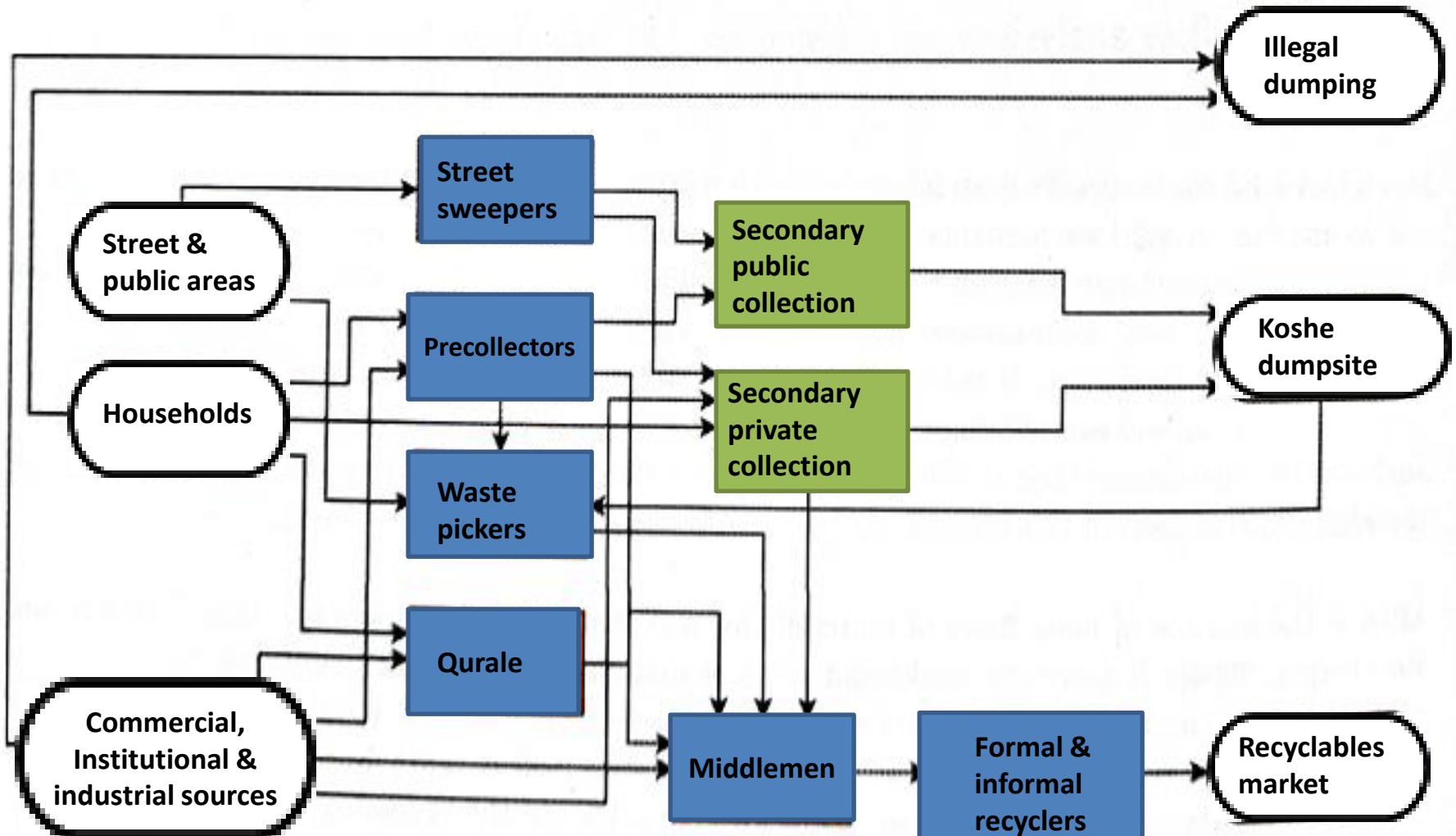
➤ **Middle men**

- People station at definite location and buy recyclable materials from qurale
- Transfer itemized recyclable solid wastes in big volume to recyclers
- Economically stronger than qurales

➤ **Informal recyclers**

- Producers of some kind of products by changing its form or making some kind of adjustment
- Products: households utilities, construction utilities, shoes, ropes, etc.

4. Addis Ababa solid waste management system



Adopted from IGNIS (2013) report

SWM system . . .

- The major components of management system
 - Primary collection
 - Secondary collection
 - Mixed solid wastes
 - Recyclable wastes
 - Transportation to recycling centers or disposal
 - Disposal site management

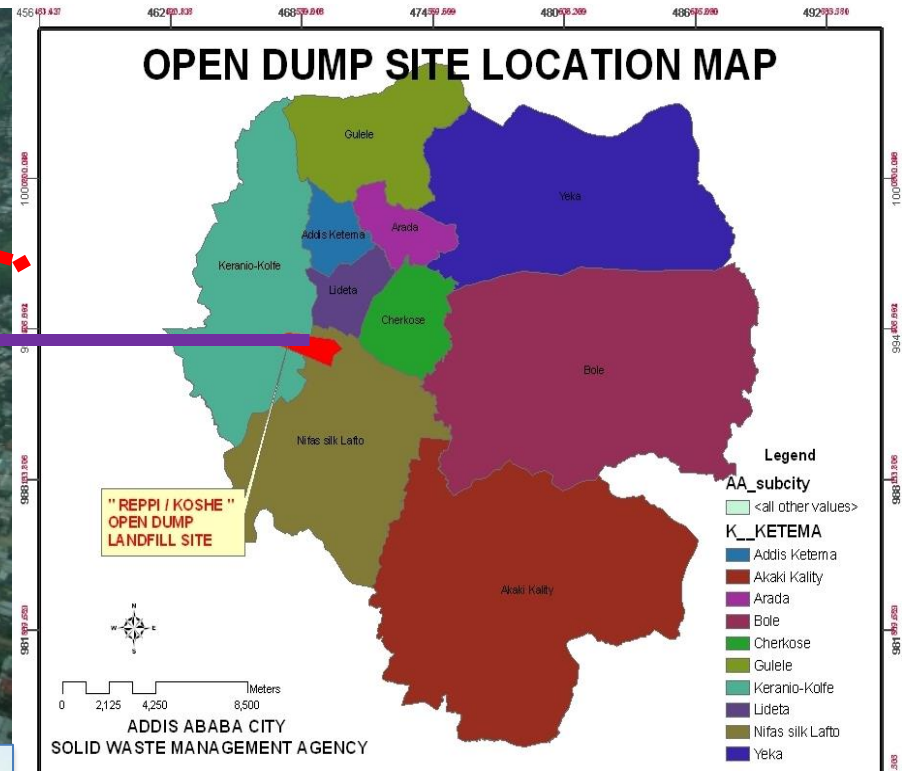
SWM system . . .

- Primary solid waste collection management
 - Residents are divided in to Zones
 - One zone constitutes about 1000 households
 - The city is divided in to 549 zones each zone
 - In each zone one MSE is assigned to work
 - The number of enterprises organized to work on solid waste collection is 520 with a total number of 5815 operators

SWM system . . .

- Secondary solid waste collection management
 - Engage public vehicles and private enterprise
 - Public trucks
 - Uses haul containers and stationary container system
 - Private enterprises
 - Uses stationery container system
 - Coverage: contracted households, institutions, street sweeping wastes
 - Destination:
 - landfill (open dump site)
 - recycling centers

SWM system . . .



LF = Open dump
Volume = 1000 tons/day



SWM system . . .

- The site is known as "Rappi" or "Koshe"
- It has been established 47 years ago
 - Then, it was outskirts of the city.
 - Now, it is in the center of settlement
- Located 13 km away from the city center.
- It has a surface area of 25 hectares.
- Disposal is crude open dumping:
 - hauling the wastes by truck
 - spreading and leveling by bulldozer and compacting by compactor

5. Good practices on SWM in Addis Ababa

- Decentralization of SWM Services to the lower tier of Administration
- Creating employment opportunities for Micro and small enterprises (Generates income for the poor)
- Primary collection from each household is done by Micro and small enterprises
- Attachment of collection and transportation service charge with water Consumption rate)

Good practices . . .

- Common SW diversion practices
 - Waste to energy facility of the solid Waste management
 - Recovering recyclable by sorting o
 - At household level
 - At transfer point by pre-collectors
 - At disposal site by waste pickers
 - Creating employment opportunities
 - 87 SMEs for collecting solid waste from households
 - 104 cooperatives for the production of compost.

Good practices . . .

Reppie waste to energy plant design



Planned

Mixed waste = 1400 ton/days

Generation = 50 MW

Actual

Mixed waste = 600 ton/day

Generation = 25 MW



Good practices . . .

➤ Recyclable waste separation

- Paper
- Plastics
- Metals

➤ Composting

- There is initiative to compost organic fraction of the solid waste generated in the city in 2020
- Amount = 326.2 tons waste from the city's largest vegetable, and fruit market has been collected
- supplied for 104 cooperatives for compost production

6. Challenges of solid waste management

➤ SWM Sector

- Low level awareness and environmental consciousness
 - Public
 - Policy makers
- unattractiveness of solid waste management for private sector
- scarcity of professional in the area

➤ Lack of segregation at source

- Low level of segregation
- Limited market for separated wastes
- Weak legal enforcement

- **Collection and Transportation**
 - Inefficient waste collection system
 - illegal dumping
 - community is not satisfied by the service delivery,
 - Some SSE still use manual carts to collect wastes;
 - Lack of modern vehicles for transportation from skip point to landfill;
- **Recovery of valuable solid wastes**
 - Very thin plastic are largely left unattended
 - Organic waste is largely dumped at the landfill
 - Weak strategy for recovery of biodegradable wastes

Thank you!