

Discuss SWM ISE by addressing the following aspects:

- What waste is generated in our home and in our colony?
- How does waste move from generation to disposal?
- Is the waste processed or directly disposed of?
- What are the consequences?

1. Introduction

Solid Waste Management (SWM) is a critical environmental and public health issue. In recent years, rapid urbanization and evolving consumption patterns have increased the volume of waste generated at both household and community levels. This report presents findings from a two-week door-to-door survey conducted in our local colony, complemented by recent data from credible online sources. Our goal is to detail waste generation figures, describe the handling process from generation to disposal, compare processing practices with direct disposal, and discuss the consequences of improper SWM.

2. Methodology

A survey was carried out in January 2025 in our colony, which comprises 50 households. Data were collected via personal interviews and direct observation of waste at the source. The survey focused on a typical household (assumed to include four members) and gathered information on the types and quantities of waste generated daily. Additionally, secondary data from sources such as the Central Pollution Control Board (CPCB) and Statista provided context and validated our local findings.

3. Household Waste Generation

Based on our survey, a typical family of four generates an average of **3.2 kilograms** of waste per day. The composition of this waste (measured in kilograms per household per day) is as follows:

- **Organic Waste:** 1.6 kg
(Food scraps, vegetable peels, and other biodegradable materials form about 50% of the waste.)
- **Plastics and Packaging:** 0.8 kg
(Packaging materials, plastic bags, and disposable items.)
- **Paper and Cardboard:** 0.4 kg
(Newspapers, magazines, and discarded paper products.)

- **Glass:** 0.1 kg
(Bottles and broken glass items.)
- **Metals:** 0.05 kg
(Aluminum cans, foil, and small metal scraps.)
- **Hazardous Items:** 0.15 kg
(Expired medicines, batteries, and cleaning chemicals.)
- **Others (e.g., textiles, dust):** 0.1 kg

4. Colony Waste Generation

Extrapolating the household data to our colony of 50 households, the community generates approximately **160 kilograms** of waste per day. A breakdown of the total daily waste generated in the colony is summarized in the table below:

Waste Type	Average per Household (kg/day)	Colony Total (kg/day)
Organic Waste	1.6	80
Plastics and Packaging	0.8	40
Paper and Cardboard	0.4	20
Glass	0.1	5
Metals	0.05	2.5
Hazardous Items	0.15	7.5
Other Waste (e.g., textiles)	0.1	5
Total	3.2	160

5. Waste Handling Process: From Generation to Disposal

Our survey revealed the following sequential process for waste management in our locality:

1. **Generation & Segregation at Source:**
 - Most households generate waste during daily activities such as cooking, cleaning, and shopping.

- Although local guidelines encourage segregation into organic, recyclable, and hazardous categories, only about 40% of households practice proper segregation consistently.

2. Collection:

- Municipal workers, along with informal waste collectors, visit each household on scheduled days.
- Waste is collected using community bins and small carts; however, mixed waste is common where source segregation is not practiced.

3. Transportation:

- Collected waste is transported in open or partially covered vehicles to local transfer stations.
- Due to limited infrastructure, sometimes waste is transported without adequate segregation or protective covers, leading to spillage.

4. Processing & Disposal:

- Organic waste is often composted at community centers or processed in small-scale composting units, while recyclables are collected by local scrap dealers.
- A significant portion of non-segregated waste is directly disposed of in nearby open dumps or landfills.
- Our findings align with national data—for instance, recent CPCB reports indicate that while nearly 68–82% of municipal solid waste in India is collected, only a fraction undergoes proper treatment.

6. Processing vs. Direct Disposal: Local Realities

In our locality, the ideal scenario of segregating waste for proper processing is only partially achieved:

• Processing:

- About 45% of collected organic waste is composted either at home or in community facilities.
- Recyclable materials, including plastics and paper, are sometimes sorted and sold to recyclers.

• Direct Disposal:

- The remaining mixed waste, particularly non-segregated and hazardous items, is disposed of in open dumps or landfills without adequate treatment.

- This practice increases the risk of environmental contamination and health hazards.

7. Consequences of Improper Waste Management

The improper management of solid waste has several far-reaching consequences:

- **Environmental Impacts:**
 - **Soil Contamination:** Leachate from open dumps can seep into the soil, reducing fertility and contaminating crops.
 - **Water Pollution:** Runoff from improperly managed waste sites can pollute local water bodies and groundwater.
 - **Air Pollution:** Burning waste, a common practice in areas lacking proper disposal methods, releases toxic pollutants including particulate matter and dioxins.
- **Health Impacts:**
 - **Disease Outbreaks:** Accumulated waste attracts pests such as rodents and insects, which can spread diseases like dengue, cholera, and leptospirosis.
 - **Respiratory Problems:** Inhalation of smoke from burning waste and dust from uncollected waste increases the incidence of respiratory ailments.
 - **Chemical Exposure:** Improper disposal of hazardous waste (e.g., batteries and chemicals) can lead to direct exposure to toxins, affecting both short-term and long-term health.

8. Conclusion and Recommendations

The survey study, supported by secondary data, reveals that while our local waste management system performs basic collection functions, there are significant gaps in source segregation and processing. To improve the situation, we recommend the following:

- **Enhanced Public Awareness:** Educate residents on the importance of proper waste segregation at the source.
- **Improved Infrastructure:** Increase the availability of segregated waste bins and enhance transportation facilities with fully covered vehicles.
- **Community Composting Programs:** Expand local composting initiatives to manage organic waste effectively.
- **Stricter Enforcement:** Implement and enforce regulations to reduce the direct disposal of hazardous and mixed waste. Adopting these measures can significantly reduce environmental pollution and improve public health in our community.