

Burning of India's Garbage Landfills - Issues and Challenges

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Context - The Kochi landfill site has caught fire. This is a stark reminder that Indian cities need to be prepared for more such incidents as summer approaches.

About Landfills

- Garbage landfills, also known as waste disposal sites or dumps, are areas where waste materials are disposed of by burying them in the ground.
- They are designed to contain and isolate the waste from the surrounding environment, preventing the spread of pollutants and contamination of soil and water sources.
- Garbage landfills are commonly used for the disposal of non-hazardous municipal solid waste, such as household trash, construction debris, and yard waste.
- However, they can also be used for the disposal of hazardous waste and other types of industrial waste, depending on the regulations and restrictions in place.

Landfills in India

- Indian municipalities collect more than 95% of the waste generated in cities. The efficiency of waste processing is 30-40% at best.
- Indian municipal solid waste consists of about 60% biodegradable material, 25% non-biodegradable material, and 15% inert materials.
- Municipalities are expected to process wet and dry waste separately and have recovered by-products recycled.

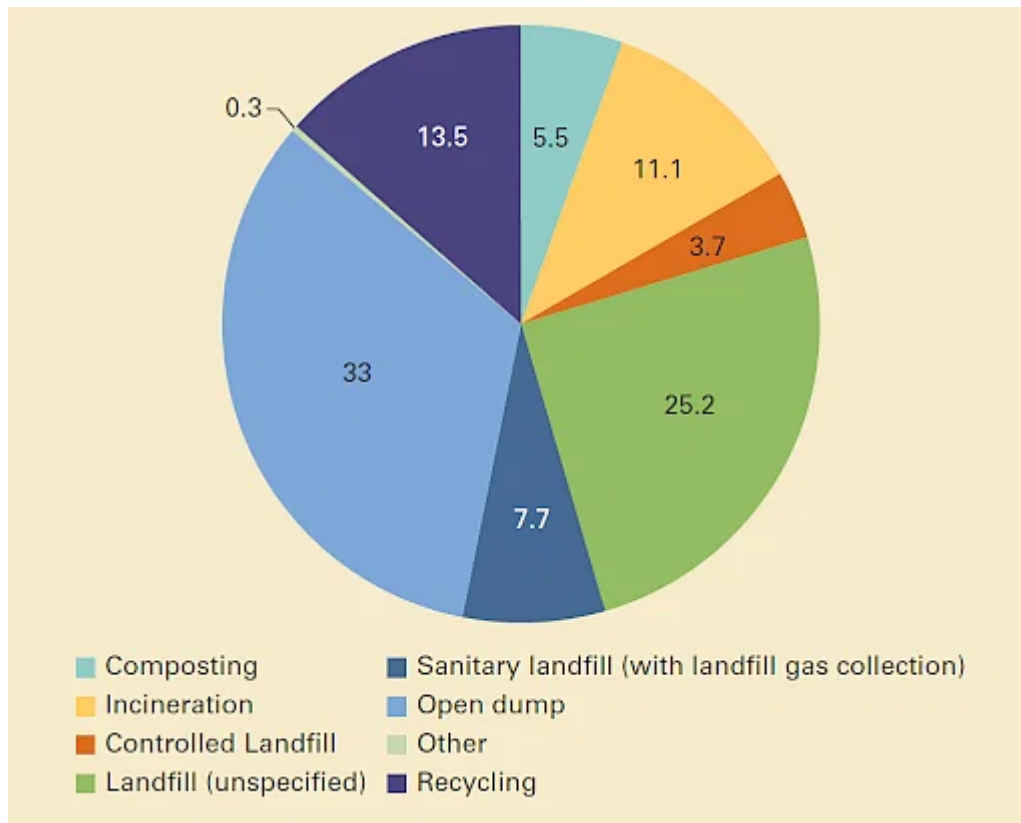
- The rate of processing in India's cities is far lower than the rate of waste generation. Unprocessed waste remains in open landfills for long periods.
- Openly disposed waste includes flammable material like low-quality plastics and rags and clothes. In summer, the biodegradable fraction composts much faster, increasing the temperature of the heap.
- Higher temperature and flammable material increase the chance for the landfill to catch fire. Some fires have been known to go on for months.

Is Landfilling the best way for Waste Management?

Landfilling is not considered the best way for garbage disposal, as it can have negative environmental impacts.

1. Landfills take up space
2. Release harmful gases such as methane and carbon dioxide.
3. Contaminate groundwater and soil not properly managed.

Landfills can emit odors and create noise pollution, which can impact nearby communities.

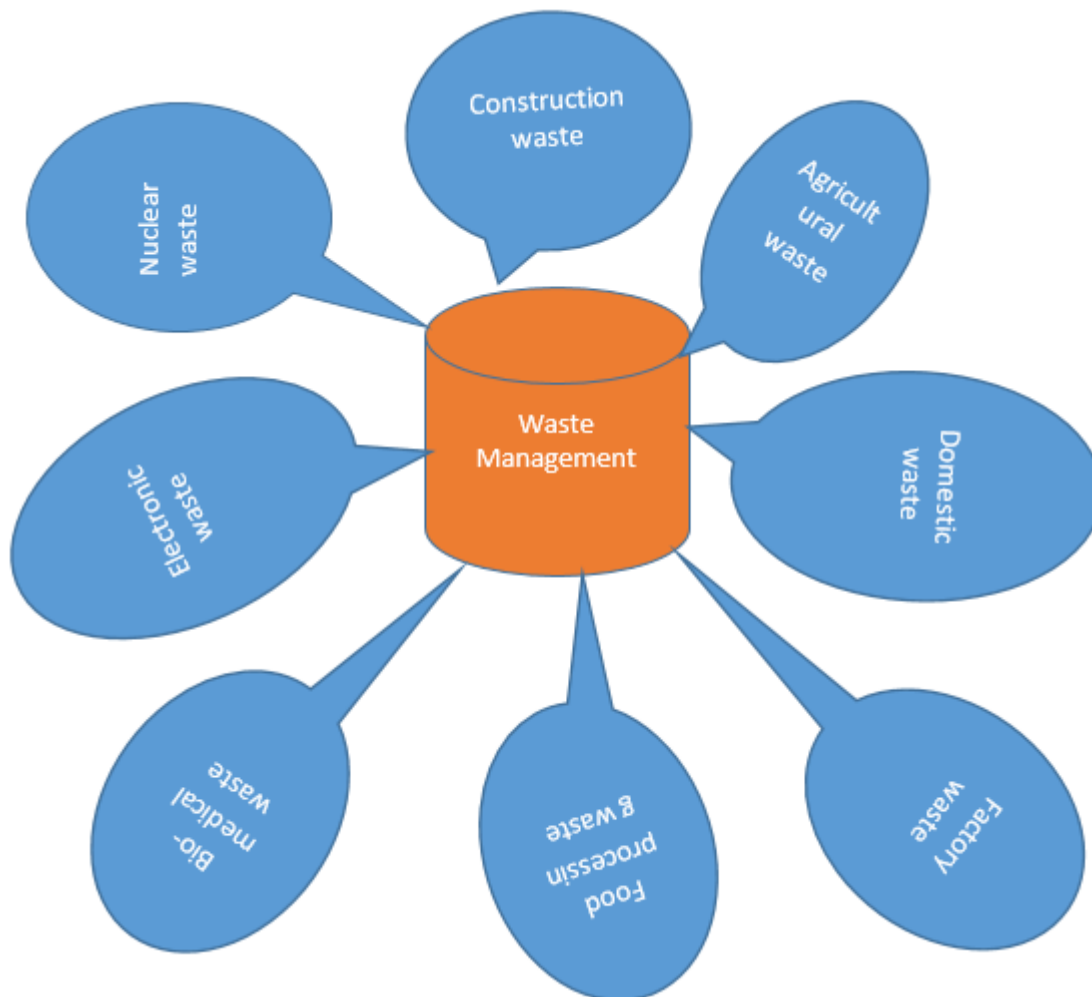


Alternative Methods

- **Recycling:** This involves the separation of waste materials such as plastics, glass, metals, and paper from the general waste stream, and processing them into new products.
- **Composting:** This is the process of breaking down organic waste materials such as food scraps, yard waste, and paper into a nutrient-rich soil amendment.
- **Waste-to-Energy:** This involves the conversion of waste into energy through incineration, gasification, or pyrolysis. The energy produced can be used to generate

electricity or heat.

- **Landfill Gas Recovery:** This involves the collection and use of methane gas produced by decomposing waste in landfills to generate electricity or heat.
- **Mechanical Biological Treatment:** This is a process that combines mechanical and biological processes to separate and treat waste materials, producing compost and recyclable materials.
- **Anaerobic Digestion:** This is a biological process that breaks down organic waste in the absence of oxygen, producing biogas and fertilizer.



Permanent Solutions for Landfills

- **Completely cap the material using soil and close landfills in a scientific manner:** This solution is unsuitable in the Indian context as the land can't be used again for other purposes. Closed landfills have specific standard operating procedures, including managing methane emissions.
- **Clear the piles of waste through bioremediation:** Excavate old waste and use automated sieving machines to segregate the flammable refuse-derived fuel (RDF), such as plastics, rags, clothes, etc., from biodegradable material. The recovered RDF can be sent to cement kilns as fuel, while the bio-soil can be distributed to farmers to enrich soil. The inert fraction will have to be landfilled.
- **Divide the site into blocks:** Based on the nature of waste, separate fresh waste from flammable material and capping portions with soil to reduce the chance of fire

spreading across blocks.

- **Cap the most vulnerable part of the landfill:** That contains lots of plastics and cloth, with soil.
- **Provide enough moisture to the fresh-waste block:** By sprinkling water and regularly turn the material for aeration to cool the waste heap.
- **Classify incoming waste:** On arrival and dispose of it in designated blocks rather than dumping mixed fractions.
- **Send to kilns on time:** Send already segregated and baled non-recyclable and non-biodegradable waste to cement kilns instead of allowing it to accumulate at the site.

Way Forward

- Sites should be equipped with water tankers with sprinklers for immediate action. The municipality should work with the nearest fire department and have a plan of action in advance.
- Waste-processing workers (plant operators, segregators, etc.) should have basic fire safety and response training. People around landfill sites should also be trained and equipped to safeguard themselves during fires.
- The municipality should have routine round-the-clock video surveillance of the most flammable portion of the landfill. Flammable material like chemical waste, match sticks, and lighters should not enter the site.
- Machines at the site, like sieves and balers, should be cleaned and moved away from the flammable material. On-site staff and security personnel should be housed away from the flammable portion.