



# Solid Waste Management in India

*A look at the problem of hills of garbage in megacities of India.*

One of the most serious issues arising out of the wave of rapid urbanization and the subsequent lifestyle changes is the management of domestic and industrial solid wastes generated domestically and well as in various industries adjoining or inside the cities. Not just the amount, but the nature of the solid waste is also changing with increasing share of plastics and packaging materials. Municipal laws governing the urban local bodies are unable to devise adequate provisions to deal effectively with the burgeoning problem of solid waste management. One of the most critical aspects of Solid Waste Management is dealing with the garbage dumpsites of the cities- most of them being open and nearby to residential areas.

## Hills of Garbage - The Present Scenario

### The Extent

- Most of the dumpsites of megacities have reached way beyond their capacity and permissible height limit of 20 meters. It is estimated that more than 10,000 hectares of urban land are locked in these dumpsites in India.
- The per capita waste generation in Indian cities ranges from 200 grams to 600 grams per day.
- Only about 75-80% of the municipal waste gets collected and only 22-28 % of this waste is processed and treated.
- The impact
  - The proliferation of airless open dumps of garbage leads to emissions of methane, which absorbs the sun's heat, warms the atmosphere and contributes to global warming.
  - Leachate, which is a black liquid oozing out from the waste as it slowly decomposes over a period of 25 to 30 years, contaminates soil and groundwater.
  - Foul odour from the waste rotting in airless heaps, and smoke from the fires that routinely erupt in them, are other consequences of dumping waste in the open.
  - The earlier landfills are without bottom liners and sideliners, which allows the Leachate to seep into the ground causing groundwater and land pollution.
  - The dumpsites being open and easily accessible, have become a site for further dumping by the public aggravating the situation.

### Legislation in India

- *Solid Waste Management Rules 2016:*
  - These rules replace the Municipal Solid Wastes (Management and Handling) Rules, 2000, are now applicable beyond municipal areas and have included urban agglomerations, census towns, notified industrial townships etc.
  - They focus on segregation of waste at source, responsibility on the manufacturer to dispose of sanitary and packaging wastes, user fees for collection, disposal and processing from the bulk generator.
  - It has also been advised that the bio-degradable waste should be processed, treated and disposed of through composting or bio-methanation within the premises as far as possible and the residual waste shall be given to the waste collectors or agency as directed by the local authority.

- The rules promote the use of compost, conversion of waste into energy, revision of parameters for landfills location and capacity.
- The government has also constituted a Central Monitoring Committee under the chairmanship of Secretary, MoEF&CC to monitor the overall implementation of the rules.
- The Rules for the Safe Treatment of Legacy Waste prescribe bio-remediation and bio-mining in all open dumpsites and existing operational dumpsites in India.
- Apart from this, **Article 51 A (g) of the Constitution** of India makes it a fundamental duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers, and wildlife, and to have compassion for living creatures.

## Capping- An Ineffective Solution

Many of the Urban Local bodies are opting for capping i.e. covering up the landfill sites as a solution to this problem. However, this may prove to be an ineffective solution as it leaves methane and leachate to form for decades within the cosmetically covered heap. The disastrous effects of building on and around a “closed landfill” were so clearly demonstrated at Malad in Mumbai, where trapped landfill gases seeped sideways through the soil into the basement of the adjoining complex, wreaking havoc on every other electronic equipment and causing ill health for residents nearby.

### NOTE

- **Bioremediation:** Bioremediation uses natural as well as recombinant microorganisms to break down toxic and hazardous substances in a solid waste by aerobic and anaerobic means.
- **Biomining:** Biomining is the process of using microorganisms (microbes) to extract metals of economic interest from rock ores or mine waste. Biomining techniques may also be used to clean up sites that have been polluted with metals.

## Way Ahead

- **Laying down clear technical norms:** It is important that Bio-mining and Bio-remediation is made compulsory for areas wherever it can be applied. It shouldn't be left to the discretion of municipalities to decide whether there are geographical constraints that prevent the use of the aforementioned techniques.
- **Biomining and Bioremediation** are superior as well as simple methods which are not only cost-effective but also environment-friendly. The best part is that the land which was a landfill is fully available for alternate uses.
- **Scientific Capping:** Capping, if it is inevitable, should be done scientifically with underground pits that have a good bottom and sideliners, and proper piping and gas extraction systems to prevent the escape of leachate and gases.
- **Decentralization of waste management:** It is important that waste management is decentralized. Ambikapur in Chhattisgarh and Vellore present a very good example of the same where the waste was collected in a decentralized manner, composted naturally and is planted.

It is important that the decision-makers at all levels of government opt for more innovative and green approaches rather than falling for the technology-extensive costly methods of waste disposal which are normally being lobbied for by the manufacturers of such technologies.