# THE PROBLEM OF WASTE ACCUMULATION AND ITS PROPER DISPOSAL IN INDIA

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**ABSTRACT**

Problem of waste accumulation in India is very crucial to deal. It is the need of the hour to have a proper assessment of the problems that is hindering the disposal of waste. (MSW) municipal solid waste and E-waste is one of the major problems of urban environment but the major challenge lies with its management the solution must be technically Feasible, socially, legally acceptable and environmentally friendly but issue with its proper management is the biggest challenge to the authorities of both small and large cities. Inspirations can be taken from across the world, not only across the world but also it can be seen in India. Indore has changed its situation in past few years becoming India's cleanest city[1]. There are various solutions for this, if implemented and enacted efficiently by the government and the society the streets of India can also look like those in London. The method of research used in this paper is Library method.

[1] Bureau, p. i. (2020). *New performance category- "Prerak Dauur Samman*" *NEW DELHI: Ministry of Housing & Urban Affairs*.

## Introduction

Waste is an unwanted or unusable material, substance, or by product which are produced by each and very organisms. Every organism one way or the other produces waste. Flora produces oxygen as a by-product of photosynthesis and fauna uses it to produce carbon dioxide which are at the end used up by flora thus creating a balance in the system. Similarly, all organisms are related to each other creating a healthy and life sustaining balance in the environment. Humans i.e., homo sapiens are considered as the smartest animal on earth yet we are continuously are on a run to harm the environment by our development and advancements. Waste accumulation and its proper disposal by humans can be seen in various civilizations and one prominent example is the Indus Valley Civilization, most of it had a properly engineered drainage system about 5000 BCE to 5500 BCE. With the passage of time the problem of waste management has also increased. Modern techniques have also proven to be effective against the waste accumulation. It includes the process of segregation of waste and treating it according to their nature. The modern systems of waste management are effective in the developed countries but due to lack of proper infrastructure, government planning and the attitude of the people towards waste and its proper disposal in the developing and under developed counties has led to mass waste accumulation on the land and in the water bodies.

## Waste management around the world

If we look around the world, an American or a European produces significantly higher municipal solid waste and E-waste as compared to India. Still those countries look neat and clean and on the other hand many cities in India looks dirty. If we see the cities in west, we can easily see that the administration has planned out their waste management and disposal very effectively. There are various studies which shows that the behavioral changes in people are important for a hygienic society but it does not mean that Indian administration cannot learn from the cities of west. In many European cities, the streets are filled with waste thrown by the people in the areas near pubs and stadiums during weekends which looks ever dirtier than the Indian streets, but the streets are cleaned by vacuum machines and the city wakes up with clean streets.

We can argue that the European and American cities are developed and are far ahead of the Asian counties in the matter of technology and resources, but Asia there is a country that has dealt with the problem of waste accumulation quiet efficiently. During the late 19$^{th}$ century,

Japan faced from problem of waste due to the modernization and rapid industrialization. After the world war, Japan saw a rapid urbanization and economic development, along with this the percentage of urban waste also rapidly increased. In the 20th century, nearly 35 million tons of waste was increased in 20 years and in the year 2005 the overall waste generation was gradually reducing. This was possible because of early planning and effective implications of the policies to ensure improve public health and fulfillment of better living conditions. the economic structure of Japan was all mass production, consumption and dumping causing mass waste production. So, the government promoted the concept of a sound material cycle society, and aims to reduce the consumption and recycle waste based on 3R (Reduce, Recycle and Reuse). Still the problem of proper waste management is present in Japan but the policies and the attitude of the community towards a clean society will definitely help in a better waste management[2].

**India, the waste management crisis**

In India, people do not take the problem of waste management very seriously, which fuels India to produce 40 million tons of garbage every year, which is 13%[3] of the total waste produced in the whole world. The second largest populated country faces various hurdles to its development. Solid waste Management is of an alarming concern and need an immediate attention. The present waste management system of India involves collecting waste from source through a community collective bin system which is then dumped in a low-lying landfill system with immediate processing of Municipal Solid Waste (MSW). The open dumping of the waste is leading to various effects like pollution including both surface and groundwater in fact, groundwater in many areas are at critical state. Current system of waste management is not ideal for the current situation[4].

With increase in number of industries and other sources of waste there are various problems and effect from this improper waste disposal.

- Land Pollution: the waste from any source ends up in soil or other land that should be

[2] How Strict Waste Management in Japan Alleviated Its Environmental Impact, By Kathy Luk, September 13th, 2021.
[3] Guidelines for preparation of detailed project reports and selection of technologies for processing and final disposal of municipal solid waste using 12th finance commission grants
[4] Challenges and opportunities associated with waste management in India, by Sunil kumar, Stephen, Geoff, Costas, S. Jyoti, Shashi arya, Rena, Rakesh and Cheeseman, Royal Society Open Science Journal.

recycled or processed. the garbage gets broken down with passage of time or rotting. This causes the micro particles get absorbed in areas and become a hazard for the people and animals.

- Water Pollution: when waste doesn't go into landfills or other disposing areas, the waste usually ends up in ocean or other water resources. It slowly breaks into the ocean and contaminates the water making it toxic and hard for the aquatic animals. The little fraction of fresh water also gets contaminated and is very unsafe for consumption. Studies shows that microplastics have ended up in the bloodstreams of humans because of it, being dissolved in water.

- Climate Change: the major problem arising out of waste is its impact of the global climate. The global warming caused by the gasses released worsens the weather and melts the ice caps, raising the level of sea and impacting native habitats of many animals and billions of people. The change in the climate can be noticeably seen from recent abnormalities in the weather in India with extreme heat and extreme rains in various areas causing flood.

- Disease: Non processed waste is a large breeding ground for critical disease. Places like landfills and contaminated water can host all kinds of fatal disease. They can affect animals, plant and people.

- Plant Death: Pollutants from both the air and water have critical effects on plants, as soil with pollutants and contamination kills most plants. Even in a contamination free soil, the water brought by the rain can be toxic enough for plants and kill them.

- Animal and Marine Death: Both land and sea animals die from the contaminated waste from around. Fishes and sea turtles are dying cause of plastics in sea. Animals are getting affects cause of dangerous substances lying around in the open. This leads to extinction of many species every day, opening a major hole in the ecosystem across the globe.

- Loss of habitat: there are range of areas where a particular animal can survive. That is why we see some particular animals at only specific part of the continent. However, waste generated contributes to changes in the global climate, which in turn changes the

size of habitats animals which they need survive. This can be seen in the case of decreasing habitat of the polar bears to extinction as they attempt to migrate out of these areas

- Lower Biodiversity: the increase in extinction of species and death of crops means the biodiversity across the world is slowly falling apart. This is fatal for the health of nature.

- Radiation and Hazardous Material: Improper handling of the radioactive waste can lead to radiation poisoning in area near the waste. If these wastes are mishandled and this gets into the local waste and are not processed properly can lead to fatality by radioactive exposure.

- The "DEAD" zones: the areas of landfills can be considered nothing but dead space. The more the waste seeps in the fills and the bigger they grow they create a place where nothing can exist, as the area will be only better for waste and garbage, thus creating an area that serves no other purpose.

- Human Impact: the humans are not immune to the impact caused by the improper waste created by themselves. The degrading environment is the result of mistreatment of the waste and ending this practice can result in extra waste cam help to reduce the problems caused by the waste and have a healthy environment[5.]

**The capital city, waste management conundrum**

The waste management conundrum of Delhi is not new. The high rate of dumping of waste has created waste mountains in Delhi i.e., in Ghazipur, Bhalswa and Okhla landfills. The height of mountain in New Delhi in on the course to rise higher than the Taj Mahal, on the route to become what UN considers the world's most polluted capital. Birds hover around the Ghazipur landfill on the eastern side of New Delhi, stray animals like cows, dogs and rats wander about the huge accumulation of filth.

According to the East Delhi superintendent engineer Arun Kumar, it is already more than 65 meters (213 feet) high and increasing with 10 meters per year. The supreme court has also warned about a stop on the dump in this landfill. The Ghazipur landfill was not meant to be

[5] How Improper Waste Disposal Affects the Environment, clean management environmental group.

this way, it was opened in 1984 and reached its peak capacity in 2002 and should have been closed at 20 meters. But cause of the pressure of waste generation the waste kept arriving out in hundreds of trucks[6].

In 2018, a part of the hill collapsed cause of heavy rains killing two people. Dumping of waste was banned after the causality, but this lasted a few days as the municipal corporation could not find alternative[7].

A study by researchers at IIT – Delhi in 2019, published in the Journal of Hazardous Toxic and Radioactive Waste, pointed out the hazardous nature of the landfills. Samples were collected from three different landfills all over India including Okhla were tested, the study detected the presence of dangerous levels of toxicity in the dark colored liquid produced when water seeped through the garbage[8].

Resident claims that the landfill makes their life difficult. "The poisonous smell has made our lives hell. People fall sick the time", says a 45-year-old local, Puneet Sharma. He also added that the plant setup to recycle the waste increases their misery more as the smoke by it is also poisonous[9].

In July 2020, former cricketer and East Delhi BJP MP Gautam Gambhir said that the mountain would be cleared when he received lots of complaints from the residents about the biomedical waste related to the Covid dumped in the landfill form various hospital in and about Delhi[10].

**Indore, India's cleanest city**

Indore has been named the cleanest city in the country for the fourth time in a row. The main pivotal reason for this achievement for Indore is the combined efforts of city's people, the public representative and government officials. The journey of Indore is very inspiring and the steps taken by it are now followed by many cities in India and across the globe.

[6] Waste management: issues and solutions for rapidly growing satellite city in National capital region, India, by Naveen, Malik, Puri, Reserchgate
[7] Rizvi. U. h. (2019*). India rubbish mountain to rise higher than taj mahal*, New Delhi: phys. org
[8] Ever-growing garbage hills of Delhi, Richa Nigam
[9] Garbage mountain at Delhi's Ghazipur landfill to rise higher than Taj Mahal by 2020, by India News
[10] Delhi's solid waste: a systemic failure, by Swati Singh

In 2016, when Indore stared working towards being the cleaned city, it had to face many challenges. Municipal Waste Management systems and processes were not in order and there was no infrastructure. The had come out of this situation which needed the support of the citizens and community, the sanitation workers had lack of motivation due to lack of monitoring system and ineffective complaint system. Also, the lack of political awareness to achieve the goals[11].

Before the cleaning process, the waste from household would dump trash in and around big garbage can at the corners. Cattle, stray dogs and flies hovered around these dumpsites. In 2016 Indore municipal corporation started to collect the waste from household and gradually asked residents to give segregated waste.

"A lot has changed now. 95% of households give segregated waste," said Kaneria, the van driver.

Collected waste is taken to private enterprises aid waste processing units, 10 transfer station in the city where the staffs make sure the waste are segregated, which are then sent to the processing facility, where it is sorted by 300 workers and the recyclable waste is sold to either the recycling industry or to companies that use this material.

More than 550 tons of organic waste are produced daily. It is then converted into compost which is sold to farmers and others as manure. The non-recyclable waste is sent to a cement plant at Neemuch and to M.P. road development corporation to be used in road construction.

Construction waste is sent to a separate private facility where it is grounded and then used as raw material for bricks, paver tiles and footpath tiles which are procured by the government for its NREGA and other public programs[12].

From the processed waste form, the vegetable, fruit and flower market, the facility converts the waste into methane and about 20 tons of the wastes are converted to 750-800 kg of bio compressed natural gas. These fuels are used to run city busses and used as cooking oil in fuel in hotels and Management colleges at subsidized rate[13].

[11] How Indore Became India's Cleanest City (And How Others Can Follow), by Shreya Khaitan.
[12] These are the secrets to Indore's 5-year 'cleanest city' streak. And it's not rocket science, by Moushumi Das
[13] (primrose magama, 2022)

Roads are cleaned every night, about 800 km of main roads are swept by machines, footpath and dividers are washed by a water mist. The water used is also the waste water recycled by sewage plants. 2200 km of the roads are swept and the waste are stored in bags and then are processed in the processing facility.

*"The stark reality is that no one wants to pay for this. No one believes they are responsible for the garbage they produce even though India has always followed the principle that the polluter pays," said Shah of Swaha, the company making mobile composting vans.*

*But "the success of Indore shows that this is doable."* It's a lighthouse project for MP, and for other similar cities across the country, said Warsi, the consultant.

**Solutions of Waste Accumulation**

There are various problems that are needed to be tackled individually and its high time that these steps must be taken by the public and the government.

- Compost: organic waste in the landfills can produce harmful greenhouse gases that increases the global temperature of the earth causing changes in the weather cycle and level of oceans. The organic waste can be composted as it is the best and effective way to reduce the waste as it will be scraped in soil. Also, this can reduce methane emissions and lowers carbon footprint.

- Segregation of waste materials: mixing up waste can contaminate the whole recycling batch. Segregation saves time and energy. The materials which can be recycled can be easily separated from the segregated waste materials. This reduces the dependency on the resources and the older materials can be reused accordingly.

- Effective waste disposal and management: a efficient strategy of the disposal and management of municipal waste can provide for improved solutions for the various problems associated with the waste materials. It ensures there is smooth progression of new and cost-effective solutions which aims at higher environmental protection. This management strategy towards waste will also ensure that landfills are efficiently located so that there can be ease in the transfer and monitoring or recycling.

- Waste to Energy Incineration: this is the processes where the wastes are used as a fuel

to create energy. This allows the waste to be used and utilized by converting it into energy which can be used further in the society.

- Anaerobic Digestion: this is the process by which microorganisms like bacteria and organisms like beetle larva also known as mealworms can digest materials like Styrofoam, and soil bacteria can eat on polyethylene terephthalate drink- bottle plastic. It also releasees methane and that can be used to power engines. This process is relatively new process which has just started to gain traction and waste management and power creating process.

- Advanced technologies: Various new technologies are being developed. Pyrolysis is the processes where waste is subjected to higher temperature and it breaks the organic matter into smaller portions making it easier to be disposed. Various other processes like plasma arc gasification catalyzes organic matter into synthetic gases called as slag. These processes are in the development stages, are not seeing widespread use.

**Conclusion**

The waste accumulation and its proper disposal in India is a big problem that need to be curtailed. This problem can be sorted out with proper planning of a system that can deal with the huge waste production and also its recycle and proper storage. There are various cities that have moved towards this proper planning system to curb the problem of waste accumulation and has gotten good results too. Cities like Indore, Surat and Vijayawada has proven to be role models. The society has to get out of there comfort zone and put little efforts with the polices of the government that can help to create a cleaner and greener city. This can help in sustainable development and also will reduce the costs incurred in unearthing new materials from earth as they can be syphoned out if the wastes itself.

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