



Overview Of Challenges in Plastic Waste Management In India

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ABSTRACT :

As per Annual report of Central Pollution Control Board (CPCB) India generates approximately 3.46 million tons of plastic waste annually, which is about 26,000 tons per day.

In terms of plastic waste generation India is behind the US and the European Union. Experts estimate that India's plastic waste generation could be much higher than the official numbers reported by states. This inconsistency is due to a lack of waste collection and disposal infrastructure, and in many places the waste is collected by the informal sector, which is mostly unregistered and unreported.

There are various challenges such as no pickup, littering, the cost of pickup, and most important is the disposal of the waste. The most challenges are interlinked and some of the solutions are also implemented but they are marred with problems in implementation and enforcement.

Keywords: Challenges in PWM, Solutions for PWM

Introduction :

Plastic waste background in India

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Source : CPCB

Major Challenges

No pickup of waste – There are many areas in various cities from where the waste is not picked up and this is due to many reasons. One of them is limited staff for collection of waste. The Municipal corporations and Nagar palika or parishad do not have enough staff for collection. To combat that problem many states have started collecting a user fee from the residents. But many residents are still not paying the same and in such instances the waste is not collected.

1. **Cost of Collection** - Municipal solid waste expenditure is between 15 to 25 per cent of the total municipal revenue expenditure in large cities and mid-size towns. While the cost of primary collection is between 25 to 40 per cent and that of transportation between 15 to 25 per cent of the total cost of solid waste management. The rest is spent on salary costs in almost all cases. A major portion as high as 45 to 60 per cent of total cost of SWM in large and mid-size cities goes into the salaries of employees and workers. But in small hilly towns and cities it could go up to 90 per cent.
2. **Failure to pick up from open areas** – when there is no regular pickup of waste most people tend to throw the garbage in open areas, which creates a hot spot that attracts more waste, that piles up. There is inconsistency of pickup from such hot spots, which creates eye sore but also becomes a health hazard.
3. **Littering** – many public places are covered with empty food packets, bottles and other waste simply because of the human habit of littering. Citizens prefer to throw the waste in open rather than carry it home. Sometimes it could be because there are no dustbins available in the public places or they are overfull. The problem also occurs when there are no regular schedules for pickups.
4. **Non-biodegradable** - The disposal of plastics is one of the highly challenging areas of plastic's environmental impact. One of most essential traits: its strength and resistance to decomposition, is also the source of one of its greatest problems when it comes to the disposal of plastics. Most of the plastics are made from fossil fuel and it is not biodegradable creating problems for its disposal.
5. **Harmful effect of plastic waste on environment** - Plastic waste in India causes severe environmental degradation. It clogs waterways, leading to flooding in urban areas during monsoons. Natural organisms have a very difficult time breaking down the synthetic chemical bonds in plastic, creating a great problem of the material's durability. When plastic is buried in a landfill, it lies untouched for years. In the process, toxic chemicals from plastics seep into groundwater, flowing downstream into lakes and rivers. The leeching of plastic also causes soil pollution and effectively depositing micro plastics in soil.
The increased amount of plastic on the surface of the ocean results in more grim problems. Since most of the plastic debris that goes into the ocean remains floating for years as it does not decompose quickly, it leads to the declining of oxygen level in the water, which affects the existence of marine species.
The micro plastic that seeps into the ocean water is ingested by various marine animals which causes of death to larger birds, fish, and mammals, the plastic is swallowed by smaller and smaller creatures and finally it affects the humans also.
The burning of plastic waste, which is a widespread disposal method, releases harmful dioxins and furans, contributing to air pollution.
6. **Dangerous for human life** – When plastic is burned it releases various dangerous and harmful gases, that causes severe health problems such as cancer, endometriosis, neurological damage, birth defects and child developmental disorders, reproductive damage, immune damage, asthma, and multiple organ damage.
7. **Segregation problems** – The plastic waste that is collected is mostly mixed with organic waste which creates problem for recycling. The segregation cost of the material is very high. In India most of the segregation is done manually and mainly by informal sector which makes it difficult to segregate different types of plastic, which results in creating problem when recycled.
8. **Disposal of Plastic waste** – even though there is huge amount of plastic, the disposal somehow is lacking in many urban local bodies and small towns. The recycling of plastic is essential. As per plastic for change One ton of recycled plastic saves 5,774 Kwh of energy, 16.3 barrels of oil, 98 million BTUs of energy, and 30 cubic yards of landfill space. There are many mechanical, chemical recycling technologies available but are not widespread. If collected plastic waste is not disposed of, then it is going to remain in nature for hundreds of years.
9. **Lack of Infrastructure** – The lack of infrastructure in various ULB's causes problems in plastic waste management. Not having enough vehicles, employees for collection as well as not having technologies to recycle the waste creates problems. Many cities and towns lack modern waste segregation and processing facilities. Advanced recycling technologies for handling multi-layered plastics and other difficult-to-recycle materials are not widely available. The lack of a widespread waste tracking system makes it difficult to monitor the flow of plastic waste from generation to disposal or recycling. The difficulty in traceability mean problem when its needs to be used in products by various brands.
10. **Economic Argues** - According to a FICCI report, India could lose over USD 133 billion worth of material value used in plastic packaging by 2030. Uncollected plastic packaging waste accounts for USD 68 billion of this loss.

11. **E-commerce and increased Packaging Waste:** The rapid growth of e-commerce in India, accelerated by the Covid-19 pandemic, has led to a surge in packaging waste. According to India Brand Equity Foundation, India's e-commerce market is expected to reach USD 200 billion by 2026, up from USD 38.5 billion in 2017. This growth corresponds with increased use of plastic packaging materials, including bubble wrap, air pillows, and polybags. Many of these materials are difficult to recycle and often end up in landfills or as litter.
12. **Regulatory and Enforcement Challenges:** India has introduced various regulations to address plastic waste pollution, but the enforcement is still posing a major challenge. Some of the problems are
 - The Plastic Waste Management Rules 2016 (amended in 2024) ban certain single-use plastics, but implementation is not consistent across states.
 - The Extended Producer Responsibility system faces issues with fraudulent certificates and inadequate monitoring.
 - Most of the recycling sector in India is informal that makes it difficult to regulate and improve practices.
1. **Presence of microplastic in food and agriculture** - A recent study conducted by the environmental research organisation Toxics Link found that Indian salt and sugar brands, whether packaged or unpackaged, contain microplastics which is a worrying trend. Similarly, use of plastic mulch in agriculture is emerging as a new problem. Studies have shown that microplastics can accumulate in agricultural soils, potentially affecting soil health, crop yields, and food safety.
2. **Increased consumption-** As per Down to Earth India is one of the world's largest consumers of plastic, using almost 21 million tons in 2021. This is a 23-fold increase from 1990, when per capita consumption was just one kilogram per person. In 2021, per capita consumption reached 15 kilograms, but this is still less than half the global average.

Conclusion

Addressing India's plastic waste problem requires increasing the recycling system as well as focusing on reducing plastic production and promoting sustainable alternatives.

There is a need to adopt various measures to combat the problems and overcome the challenges faced in plastic waste management.

1. **Waste to wealth** – Implementation of circular economic approach wherein waste is used as a raw material. To increase the flow of raw material for better recycling there is need to Establish material recovery facilities in every major city to efficiently sort and process plastic waste by promoting 4R's: reduce, reuse, recycle, and recover.
2. **Better designing the products** – The products should be designed with keeping in mind the recyclability of the product at the designing stage.
3. **Tax breaks and Subsidy** – Incentivising the manufacturers who use the recycled plastic in their manufacturing. There is also a requirement to mandate companies to use certain percentage of recycled plastics which can increase demand.
4. **Smart Technology** - Integrate smart technology into waste management systems across urban India. Use of AI for better waste sorting and recycling processes
5. **Extending EPR to cover the informal sector** - providing social security and better working conditions for waste pickers while formalizing their crucial role.
6. **Awareness campaigns** – Need to introduce inclusive nationwide campaign which educated people about the harms of plastic waste and need to segregate plastic waste. Celebrities can be used to promote plastic free lifestyles.
7. **Investing in various technologies** – Technologies such as waste to energy, pyrolysis which takes care of end of life need to be promoted. At the same time there is need for strict emission control and monitoring is required to prevent air pollution.
8. **Encourage startups in waste management** - Launch a national incubator program specifically for waste management startups. Provide seed funding, mentorship, and networking opportunities for innovative recycling businesses.
9. **Plastic in Road Construction-** Need to Expand the use of plastic waste in road construction. Updating the guidelines and developing standardized guidelines for the optimal mix of plastic waste in road materials.

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