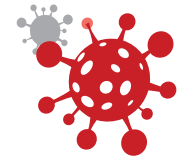


A Guide on Waste Management in Indian Cities During & After COVID-19



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Introduction

The COVID-19 pandemic has affected the world including India. Due to the highly infectious nature of the disease, most countries resorted to social distancing as a public norm and imposed lockdowns. Lockdowns allowed only essential services. Waste management as an essential service continued. While municipal waste management still remained operational, waste like construction and demolition (C&D) waste and bio-medical waste disposal remained a major concern. The crisis due to the pandemic has also altered the ways and forms of waste generation. The unexpected fluctuations in waste composition and quantity, necessitate modifications in the conventional waste management systems. In the last 6 months of lockdowns and restricted movements, numerous obstacles and challenges have been witnessed in the waste management sector especially C&D waste management around the world. The systems are trying to adapt to the new requirements.

This guide tries to capture the disruptions caused in the sector due to the pandemic during the entire span, and the mandatory requirements and response to the waste management crisis as of now. Further, the study also presents the nature of the disruptions- permanent or temporary and accordingly provides some practical solutions.



Disruptions in the Waste Management Sector Due to COVID-19

Before the pandemic, bio-medical waste stream used to be separate and had a clear value chain, emerging from hospitals and ending at the hazardous waste disposal facilities. After the outburst of COVID-19, the value chain is scattered and there has been a significant rise in the quantity of bio-medical waste generated. According to a report submitted by Central Pollution Control Board (CPCB) to National Green Tribunal (NGT) in July' 20, India generated 101 TPD of bio-medical waste due to COVID-19. This is in addition to the regular generation of 609 TPD¹. The increase has two reasons:

- **Increase in waste generation from medical facilities** as they battle the virus through extensive testing and treatment of corona patients. Therefore, all cotton swabs, samples, injections among other medical inputs necessary to test and treat these patients become highly contagious.
- **Households add to bio-medical waste generation** as home quarantining is one of the effective strategies used in COVID-19. Due to which, the waste coming out of the households is infected in nature. Also, the amount of infected waste becomes even more due to in-efficient segregation practices.

Impact of COVID-19 pandemic

1.1 Rise in Bio-Medical Waste - Inadequate Collection and Disposal Infrastructure



Overall, the waste management system in Indian cities was not equipped to handle large quantities of bio-medical waste (BMW). There are approximately 200 bio-medical waste treatment facilities (BMWTF) which are currently working at 70-75% capacity, much higher than the pre-pandemic times. Below are few instances of issues/challenges faced by cities:

- West Bengal has six BMW treatment and disposal facilities, all running at their threshold capacities. The operators have flagged this issue to the government. They also suggested that if the current high quantity of mixed waste is effectively segregated, then it can surely reduce quantities going into BMW facilities. In fact, about 70% of the waste coming as BMW is actually municipal solid waste (MSW) which impacts the performance of the facilities.²
- In Hyderabad also, hospitals have run out of treatment capacity and piling bio-medical waste.

¹ <https://swachhindia.ndtv.com/coronavirus-pandemic-exposes-broken-system-of-bio-medical-waste-management-experts-discuss-the-issue-and-solutions-49427/> accessed on 19th October 2020



- In Delhi, 2 BMWTF are grappling with increased load of bio-medical waste and demanding that the waste to energy plants should also help in disposing the surplus waste.
- In Chennai, collection and transportation of bio-medical was a big challenge until a separate contractor was appointed in July'20. Due to lack of infrastructure for collection & transportation, they resorted to deep pit burial technique.³
- In Kerala, BMW Facility Operator are also burdened by the burgeoning COVID-19 waste and demanding financial support from government for increased operational expenditure and expansion of capacity.⁴

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Kerala – Home Waste Management Practices proving worthwhile during testing times

Majority of the households traditionally practice segregation at source and household composting. Due to the lockdown imposed during the pandemic the burden of dry waste on many municipalities has reduced as it led to lesser waste being collected. Their existing practices of managing waste at source proved to be beneficial during this crisis.

Households in cities like Thiruvananthapuram, Kochi and Alappuzha are processing wet waste at source (by means of aerobic bins, biogas, pipe composting), and only dry waste is being collected by municipality. Local self-help groups, informal sector and volunteers are playing a crucial role by providing support to municipalities.

² <https://www.hindustantimes.com/india-news/wb-stares-at-COVID-19-biomedical-waste-crisis-as-disposal-facilities-reach-threshold-capacity/story-ZGSTqpCzBCtEnbZGAhhSYK.html> updated on 11 August 2020, accessed on 15th October 2020

³ <https://timesofindia.indiatimes.com/city/chennai/poor-handling-of-biomedical-waste-puts-chennai-under-threat/articleshow/77188710.cms> updated on 27th July, 2020 and accessed on 15th October 2020

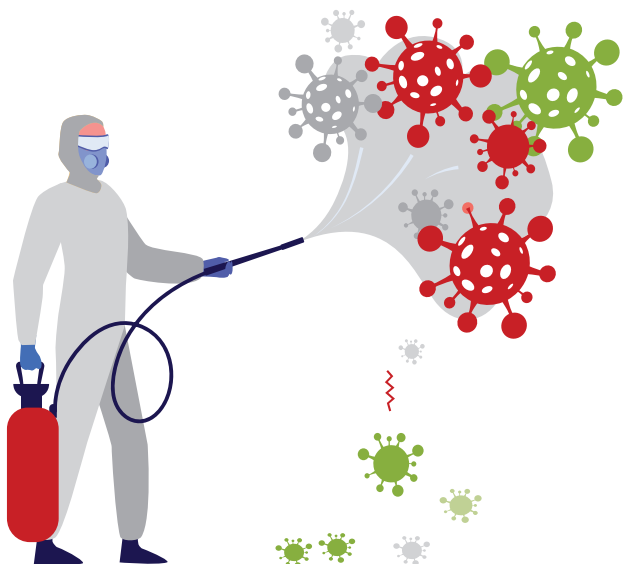
⁴ <https://timesofindia.indiatimes.com/city/kochi/image-facility-in-kerala-burdened-by-burgeoning-COVID-19-waste/articleshow/77078071.cms> updated on 21st July, 2020 and accessed on 15th October 2020

1.2 Expansion in BMW Generating Sources - Increased Exposure of Sanitary Workers



After the outbreak of COVID-19, the sources of waste generation now also include households, quarantine homes, quarantine centers apart from hospitals, clinics and labs. The collection of waste from hospitals, clinics and labs are usually done by the registered/authorized operator and their workers who are experienced in handling, collecting, and transporting the waste with optimal care so that infections are not transmitted. However, for collection of waste from households, quarantine centers and homes, general sanitary workers are deployed. The sanitary workers are directly exposed to the waste, and therefore are under extreme health risk. Also, a major chunk of workers have left cities for their villages thus creating a shortage of workers in cities now.

As reported in many cities, workers are not provided adequate PPEs. The quarantine homes and centers are not fully aware of the waste segregation practice and there are instances of mixing of household waste with COVID-19 infectious waste. This makes the task of sanitary workers even more difficult and dangerous for their life. With quarantine moving to lanes and floors rather than the whole community there is uncertainty on how the waste pick-up for neighboring homes of the affected is to be handled. Even the time lapse between occurrence of symptoms and declaring COVID-19 positive before the house is added to the quarantine list can be life-threatening for the sanitary worker engaged in daily collection of their waste.



1.3 Plastic Waste Generation on the Rise Due to Increased Use of Single-use Plastics



Over several years leading up to 2020, efforts were made to phase out single-use plastics. Slowly and steadily, the behavioral changes were observed in the consumption practices. After the COVID-19 outbreak, the world is leaning back to the old practices out of the health and hygiene concern. Since the pandemic, there has been a significant increase in single-use plastic waste, such as medical waste from protective equipment including PP masks, gloves and gowns, and increased purchases of disposables such as plastic cutlery, cups, containers, low-micron count carry bags, garbage bags and packaged drinking water as a safety measure to avoid contracting COVID-19. In addition to this, lockdown has also brought behavioral changes in purchasing practices, preference more towards online purchases- which also adds to the plastic waste.

1.4 Informal Sector Struggling - Plastic Waste Recycling Sector Disrupted



The waste-pickers provide a crucial role in the waste recycling sector and contribute to 60-70% recycling of the plastic waste in the country. When the lockdown was declared, the government did not include waste-pickers and *kabadivallas* in the 'essential services' category. This led to workers leaving cities and thereby, impacting plastic recycling informal practices. On the other hand, since the lockdown, many waste management's recycling facilities, including those working on the ground, halted their services. In April'20, a few recycling plants resumed operation due to lockdown relaxation by the central government with limited capacity (30%). Because of the manpower shortage and fear of coronavirus, secondary segregation was not happening at all. Due to broken supply chain, Aggregators/Scrap Dealers were not able to access their earlier capacity of plastic waste quantities. In Bangalore, most of the dry waste collection centers are flooded with non-recyclable items such as low-value plastic as the cement factories where these items are usually transported, have been shut since the start of the lockdown. The dry waste collection centers (DWCC) are now running out of space for storing waste. Similarly, many cities are facing the problems of waste overflow and disposal. All this adds to the impact on plastic recycling sector.

Priority Interventions

Waste can be a potential carrier of the virus and the waste collectors cannot be expected to maintain the status quo. On top of that, with rise of asymptomatic cases, the waste management systems cannot rely on one body (Municipal Corporation or service provider). All of us have to be party to the solution here.

Priority 1: Amendments in Waste Collection Mechanisms and Ensure Segregation of Infected Waste as a Fourth Stream.

Segregation at source is required more than ever. The current SWM Rules 2016 asks for segregation into 3 categories wet/biodegradable, dry/non-bio degradable and domestic hazardous waste. A fourth category for infected biomedical waste is recommended. This can be specified provision especially during pandemic like COVID-19. With the expansion of healthcare to temporary hospitals, isolation centers, camps, quarantined homes, testing centers the health risk to sanitary workers is bigger. The potential of transmission of virus from infected waste is very high. Therefore, waste segregation is important more from a health point of view and not only because of environmental concerns. CPCB also advises to segregate BMW at source where COVID-19 patients are staying. As per the guideline, the local authority has to provide a safety kit to the quarantine homes/centers for the same. They also should be briefed on the SOP including waste management. The safety kit should comprise of yellow bags for disposing the infected waste. In addition to this, the local authority should take following actions:

- In COVID-19 times, segregating of sources so that the general population including slums and informal settlements shall be dealt separately and people in home quarantines, quarantine camps, COVID-19 hotspots, hospitals and diagnostic labs dealt separately. This will essentially mean deploying separate collection manpower for COVID-19 and non-COVID-19 sources.
- Promoting segregation at source by encouraging citizens to do the segregation at source and ensure the collectors are not put to these tasks.
- Disposal of contaminated waste and setting different frequency of collection. The contaminated waste should be collected daily and a separate time frequency can be set for non-contaminated waste. This will reduce the chances of contamination of other wastes and also increase the efficiency. The local authorities have collaborated with hospitals and incineration facilities available in cities for disposal of waste. The BMW should be disposed through such facilities. In case such facilities are not available, deep burial can be done. In case, deep burial could not be done, contaminated waste should be quarantined



for a minimum of 72 hours prior to their disposal as general waste.

- **Collaboration on mass-scale:** Now, contaminated waste also comes as part of the general waste stream and will continue in the near future. It is important to make people aware of the additional waste streams. WHO, national governments, policy advocacy organizations, NGOs and influencers are already communicating and rapidly spreading the message. Collaboration at national and global level amongst interested organizations and individuals is very important to drive through this.
- **Building capacities:** Sanitary workers can also be instrumental in spreading awareness, as they are in direct contact with waste generator. Training can be provided to sanitary workers on educating people on potential hazards, safe waste handling procedures especially from areas of high COVID-19 risks, reporting of exposures and injuries, use of PPE, and hygiene practice at processing/recycling plants etc. Drivers and waste handlers who are transporting waste to the central processing and disposal sites also need training and education, informing them of the risks and handling of driving trucks with contaminated waste.

appropriate workplace protocols to prevent or reduce the likelihood of exposure and infection.

- **Creating a safe and healthy working environment for contaminated waste handlers/workers is also required.** In the time of the COVID-19 pandemic, in addition to trainings on safe contaminated waste management, awareness raising on precautionary practices are also required, such as (i) Sick employees should stay home; (ii) Routine environmental cleaning of workplaces; (iii) Healthy employees notifying supervisors if a family member is sick; (iv) Employers notifying other employee if an employee is confirmed to have COVID-19, for possible exposure etc. Additionally, strategies to reduce human interaction and ensure distance between handlers at work should be put in place and work shifts could be revised.
- **Awareness raising and communications for contaminated waste handlers and bulk generators is also required.** This includes activities such as development of additional guidelines on handling, disposal and processing of waste generated (public communications); development of media (such as website, public service announcement) for hygiene practice and safe handling of contaminated waste management and so on.

All workers must be trained on risks of exposure to the virus, hazards associated with that exposure, and

CPCB on disposal of potential COVID-19 infected waste

CPCB brought out guidelines for handling, treatment and disposal of COVID-19 infected waste in April'20 and revised guideline was issued on 21st July 2020. For disposal, the CPCB suggests following:

- Use of double-layered bags for collection of waste
- Only the used masks, swabs, syringes etc. generated by COVID-19 patient in hospital, quarantine home or centre will be considered as BMW
- The general waste would be dealt as it is, even coming from quarantine places
- The BMW generated by other persons (not patient) has to be kept at source for 72 hours and submitted as general waste
- Treatment of waste by certified bio-medical waste treatment facilities. In case the city or state does not have any such facility, the existing captive facilities of any hospital may be identified by urban local bodies (ULB) for disposal of COVID-19 waste. Also, the deep burial pits are permitted for yellow category waste

Priority 2: Secure Interest of Informal Sector: Critical for Revamping Plastic Recycling Sector in the Country

During pandemic times, cities have come to realize the importance of the services provided by informal workers in waste segregation. Without secondary level of recycling, the waste management system had completely come to a halt. Reacting to the rapidly evolving situation, waste picker savvy organizations such as SWACH are coming up with various initiatives including promoting gloves and masks to prevent physical contact with trash and to keep a distance from people and waste that is known to have been generated by COVID-19 patients. In the midst of this situation, government has also realized the work the sanitary workers are engaged and its importance. Therefore, the government has proposed to provide insurance cover of Rs 50 lakh per person to frontline health workers including the sanitation staff. But this only includes waste collection workers and does not include waste pickers. Following actions can be taken by ULBs to secure interest of the informal sector:

- **Ensuring informal workers are provided the means of living:** The informal workers are crucial for the country's recycling sector. They are involved in waste picking, supporting the supply chain and conversion of plastic into resins, and also supplying into market. If we lose them now, the recycling market will not be able to revive in the current conditions. Therefore, it's important to ensure that the workers are at least provided basic means of livelihood.
- **Local governments to encourage support and provide financial assistance to contractors:** The contractors are currently either partially working or not working at all during lockdown. Local government should have continuous communication with contractors and waste processor to reassure them of their role and need. They can also be provided financial assistance.
- **Provision of PPEs:** Waste pickers are usually out of sight and not provided PPEs. During this time, the local government shall provide the requisite PPEs to them.

A Case Study

Effective Waste Management Practices

Ambikapur- Mobilising swachhata warriors

Swachhata Didis, women led cooperative who are responsible for waste management not only collected the segregated waste (dry, wet and domestic hazardous) but also created awareness among residents about the importance of sanitary practices such as wearing masks and washing hands often. The municipality also trained them to make cloth masks and local sanitizers (as per WHO guidelines). They were sold at marginal rates and people were encouraged to purchase and use them to stay safe from the virus. The 17 decentralized material centers where plastic is sorted into over 150 fractions are being sanitized twice a day.

Bengaluru

Its civic body Bruhat Bengaluru Mahanagara Palike (BBMP) is creating awareness drives to sensitize people about the spread of virus from sanitary waste. So, they are informing people to put any waste which is contaminated with bodily fluids in a separate cover and not mix them with wet or dry waste. They revised the penalty amount to Rs. 1,000 (collected from defaulters for not segregating waste) for the first offense and Rs. 2,000 for subsequent offenses.

Panchgani (Maharashtra)

In spite of being a tourist hub which is very close to Pune (a COVID-19 hotspot), due to its decentralized waste management practices, the city's population was not affected by the virus. It is a no landfill city and has been practicing source level segregation and 100% door-to-door (D2D) collection for the past few years.

Measures taken: Panchgani Municipal Corporation has made it obligatory for residents to segregate used masks and gloves in household and kept separately, every 15 days this segregated waste is collected and sent to the biomedical incinerator facility.

Priority 3: Enhance Recycling Infrastructure and Encourage Recycling Efforts: Critical for Plastic Recycling Sector

Recycling is recognized as one of the important economic activities in terms of saving resources and employment generation. Amongst other waste streams, plastic has the major focus at various national and international platforms. Recognizing the potential, many start-ups have also founded in the sector with various solutions- technological, operational, logistical and even digital. Current times provide us an opportunity to look back at our approaches and revamp them to achieve a more sustainable solution. Following actions can be

taken to ensure that the recycling sector takes off well in future:

- **Fuel the supply chains and encouraging start-ups:** It is necessary to maintain the supply of waste (input) into processing facilities through continued and optimised operations. Many cities are witnessing new projects and partnerships spurring for plastic waste specially. The ULBs should encourage and identify start-ups to avail these opportunities and provide necessary support such as permissions, quantity diversion, land, manpower, equipment & machinery etc.
- **Off-take consumption:** The government should plan for procuring the products made from waste such as recycled plastic and compost.



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Germany – Precautions for Waste Management

Waste management in hospitals

- In Germany potentially infectious waste related to COVID-19 treatment has to be put under the respective EU-waste code 18 01 03: wastes whose collection and disposal is subject to special requirements in order to prevent infection. This waste has to be considered as hazardous healthcare waste and needs special bags and collection as well as treatment in incinerators or autoclaves to be disinfected.
- Other solid healthcare waste from treatment of COVID-19 patients is not considered as infectious and falls under the waste code 18 01 04: wastes whose collection and disposal is not subject to special requirements in order to prevent infection (for example dressings, plaster casts, linen, disposable clothing, diapers). These wastes still require special collection methods as non-hazardous healthcare waste with respective bags. Sharps and others also need special boxes to be collected without causing harm to the staff.

General solid waste management

- The European Union has issued guidelines for the handling of waste during the COVID-19 pandemic which foresees for normal waste management without infectious waste the procedures as valid in the respective countries. For households where infections occur it is recommended to separate the COVID-19 related waste and collect it in separate plastic bags. The waste can then be collected with the remaining waste by the service provider.
- Generally, the waste composition has also changed in Germany during the lockdown between March and June 2020 and afterwards. Plastic generation has increased by around 10%. This also means an additional burden for the waste management service providers as the storage area is much more occupied with recycling waste from plastic. In parallel the recycled plastic waste does not find off-takers easily as the oil price has dropped considerably, economic growth has decreased and the consumption of plastic waste as raw material for secondary plastic production has also slowed down considerably.
- Furthermore, domestic waste has also increased. In Berlin, for example by around 8% through a larger domestic consumption caused by the necessity to stay home and work at home. The need for disinfection and clean packaging material has increased the use of primary packaging material.
- This development has reversed the attempts to reduce the utilization of packaging material, especially plastics. The regulatory measures, however are still in place and need to be affected. If the situation will continue or will get back to normal has still to be seen.

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