

# Review on Solid Waste Management during COVID-19 and its Effect on the Social Community in Jaipur, Rajasthan

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## ABSTRACT

The containment of the spread of COVID-19 pandemic and limitations on commercial activities, mobility and manufacturing sector have significantly affected waste management. Waste management is critical to human development and health outcomes, especially during the COVID-19 pandemic. It reviews current waste management practices and identifies significant challenges and local solutions in the effective management of trash generated by healthcare facilities, households, and quarantine facilities with people who have been diagnosed with COVID-19 or are suspected of having it. It also seeks to identify the best accessible methods or acceptable technologies that can be swiftly and readily deployed in underdeveloped nations to limit the risk of COVID-19 infection through waste management activities. This study examines the current condition of solid waste management in India and suggests solutions to the problems. Waste generated by healthcare facilities, medical laboratories, and biomedical research institutes is referred to as healthcare waste. By exposing waste pickers, waste workers, health workers, patients, and the general public to infectious pathogens, improper waste treatment offers a major danger of disease transmission. In the Jaipur area of Rajasthan, poor waste management releases dangerous and detrimental chemicals into society. Solid waste management (SWM) has emerged as one of India's most significant development challenges. Improper solid waste management endangers the environment and public health.

**Key-words:** Covid-19, Pandemic, Public health, Solid waste management (SWM), World Health Organization

## INTRODUCTION

In March 2020, the World Health Organization (WHO) proclaimed the COVID-19 outbreak a pandemic [1], caused by a SARS-Cov-2 virus capable of rapidly spreading throughout the globe [2]. There are now approximately 20.1 million confirmed cases worldwide, with 742 thousand deaths. The top ten countries with reported cases are the United States (5,094,400 citizens), Brazil (3,057,470 citizens), India (2,268,675 citizens), Russia (890,799 citizens), South Africa (563,598 citizens),

Mexico (485,836 citizens), Peru (483,133 citizens), Colombia (397,623 people), Chile (375,044 citizens), and Iran (328,844), with total confirmed cases exceeding 13.95 million [as of August 10, 2020 at 18:00 GMT] [3]. In the pandemic, Jaipur, like other cities are dealing with insufficient solid waste management. A huge amount of solid waste is thrown on any open area, adjacent buildings, and in the open market during Covid-19. The purpose of this study is to assess the current state of MSW in Jaipur to identify the major challenges to its efficiency and the prospects for improving the city's solid waste management system and disposal, as well as to investigate the impact of rapid population growth due to uncontrolled and unplanned urbanization on environmental degradation through solid waste disposal. The current severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has emerged as a very virulent strain of newly developing coronaviruses, after

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the SARS-CoV-1 and Middle East respiratory disease (MERS-CoV) coronaviruses in the last two decades <sup>[4]</sup>. In India, where urbanization, industrialization, and economic growth have resulted in increased municipal solid waste (MSW) creation per person (ULBs), solid waste management (SWM) is a major issue for many urban local bodies <sup>[5]</sup>.

Effective SWM in heavily populated cities is quite difficult. It is more difficult to achieve sustainable development in a country with a rapidly rising population and improved living conditions since India is such a multicultural society with so many different religious groups, traditions, and customs. Hazardous elements found in MSW include pesticides, paints, unused pharmaceuticals, and batteries. Fruits, vegetables, and food waste are examples of compostable organics. Healthcare waste, such as disposable syringes, sanitary products, and blood-containing materials, is managed under the Biomedical Waste (Management and Handling) Rules 1998 and the Amended Rules, 2003. Pesticides, paints, leftover medications, and batteries are among the hazardous materials contained in MSW. Compostable organics include fruits, vegetables, and food waste. The Biomedical Waste (Management and Handling) Rules 1998 and the Amended Rules, 2003 regulate healthcare trash, which includes disposable syringes, sanitary items, and blood-containing fabrics. Healthcare waste shall not be mixed with MSW <sup>[6]</sup>. The typical MSW mix produced by Indian cities is roughly 41 weight percent organic, 40 weight percent inerts, and 19 weight percent possibly recyclable materials <sup>[7]</sup>.

Rajasthan is one of the largest states of India in terms of area, with a population of 6.85 Crores. There are 33 districts, 193 Urban Local Bodies (ULBs), 295 Panchayat Samitis and 9,892 Gram Panchayats (GPs) in Rajasthan State. The total solid waste generation in the state is about 6,500 TPD. With growing urbanization and changing lifestyles, the generation of waste and its appropriate disposal has become a challenge for the state.

The Jaipur Nagar Nigam has a population of 3,073,350 people and also is subdivided among 91 wards. Depending on the waste composition, the amount of garbage generated in Jaipur city ranges from 1200 to 1400 MT/day. JNN is in charge of designing a waste management policy and setting objectives. On-site, two representative sample wards were also assessed

(Sevapura, Mathura Daspura). The checklist for procedures used assessed the presence and absence of safety safeguards, regulatory compliance, and pollution minimization. Every year, at least 5.2 million people worldwide, including 4 million children, die from diseases caused by uncontrolled medical waste <sup>[8]</sup>.

**Guidelines for MSWM-** As a result, many guidelines have been established, including <sup>[9]</sup>: (1) proper management of municipal solid trash employing PPE, safety procedures, and administrative and engineering controls. (2) Treating COVID-19-infected medical waste as regulated medical waste. (3) Waste recycling with infection and cross-contamination prevention procedures (4) Proper wastewater management, including inactivation with ultraviolet irradiation and oxidation with per-acetic acid and hypochlorite. As a result, waste management is a crucial public service for preventing the spread of COVID-19 <sup>[10]</sup>. Based on the recommendations of the Intergovernmental Panel on Climate Change (IPCC) model, the authors looked at the greenhouse gases generated from MSW in Faridabad, India, and analyzed the performance of landfilling and waste energy conversion methods. GHG emissions and climate change LPA (Linear Pinch Analysis) was used <sup>[11]</sup>. Because of increased trash output and poor waste management pollution of the terrestrial and marine environment was already a major issue internationally before the COVID-19 pandemic <sup>[12,13]</sup> and as a result of the emergence of the pandemic, handling plastic waste like protective gears, personal protective equipment (PPE), disposable life support equipment and general plastic supplies such as syringes <sup>[14-17]</sup> used in the prevention and treatment of the virus, poses a significant issue <sup>[18,19]</sup>. This paper is trying to examine the influence of the COVID-19 pandemic on waste management around the world.

**Healthcare Waste Management-** Nonmedical and household-related products such as masks, gloves, syringes, thermometers, sanitisers and cleaning products, toilet papers, and foodstuffs saw an increase in production and consumption patterns as a result of the implementation of lockdown, stay-at-home policy initiatives, and other preventive measures to contain the spread of COVID-19. Concerns about the virus and a sudden lockdown have resulted in a surge in single-use products and panic purchases <sup>[20]</sup>. As per reports, the



unprecedented use of masks to restrict COVID-19 exposure enhanced output, resulting in a US\$166 billion increase in global sales <sup>[21]</sup>.

**Process of Health Care and MSWM in Jaipur-** The amount of garbage produced varies depending on the population's consumption dynamics and changes in social behaviours. People have had to adjust their life patterns as a result of the recent scenario forced by the COVID-19 pandemic. Being at home more often became a command drawn from preventive isolation, rather than a measure of self-care. Suitable methods in waste management and the corporate social responsibility framework can be used to bring in necessary changes in the environment and the economy <sup>[22]</sup>. To efficiently sell the waste generated involves apportioning the cost of waste processed. This must be done by including households at the primary disposal level. Then private entities can be involved in final disposal <sup>[23]</sup>.

**Collection-** Waste collection, storage, and transportation are critical components of any SWM system, but they can be difficult in cities. In India, municipal organizations are responsible for waste collection, and bins are often supplied for biodegradable and inert waste <sup>[24]</sup>. From April 2017, the full 91 wards will have a door-to-door system, which will cost roughly Rs.1650/- per MT. The Jaipur Municipal Corporation employs a total of 6618 people, including 6330 sweepers, 208 supervisors, 70 sanitation inspectors, and 10 chief sanitation inspectors who cover the city's 5 million households. In the city, 212 slums are a major source of filth and disease. In these situations, MSWM becomes a challenge.

The door-to-door collection is the most popular type of waste collection from Jaipur residents, followed by community bin collection. Pay for the rubbish collectors around Rs. 40 each month for their services. Door-to-door waste collection is done with handcarts, which have six buckets to store dry and wet wastes separately, and in some locations, disposal bins with a storage capacity of 12 tonnes of rubbish are put every 250 meters along streets. Door-to-door collection, sweeping, emptying dustbins, and cleaning dark spots are all handled by 4500 people <sup>[25]</sup>.

The truck's weight-to-weight ratio is 4:20. Tricycles, bullock carts, and other collection systems are examples. The waste collection might be problematic due to narrow roadways, and as a result, waste is not picked up

on time, resulting in improper circumstances. In Jaipur, there are no transfer stations. During the site survey, however, it was discovered that several of the wards still have community bins in a filthy state. Commercial vegetable markets generate a considerable amount of organic waste. At an interaction point known as a synchronization point, rubbish collected in pushcarts from lanes is transferred to a truck.

At a predetermined time, the truck arrives at the designated location. A huge capacity truck and lorries transport the waste to the disposal site, while the small capacity vehicle or dumper placers transport the rubbish in a few wards. To prevent dispersing, the truck is covered with a wired mesh and polythene covering <sup>[26]</sup>.

All of these products are non-biodegradable and end up as solid garbage. To reduce the danger of infection, PPE waste created in medical facilities must be properly collected, transported, and disposed of as medical waste (hazardous) <sup>[27]</sup>.

**Processing of Wastes-** According to the Jaipur Municipal Corporation's Solid Trash Management report (2019-20), 1477 TPD of MSW is created, including 834.1 TPD of wet waste and 642.8 TPD of dry waste. The daily production of construction and demolition waste is estimated to be over 300 tonnes. For MSW, Jaipur has three Garbage Transfer Stations, but it needs ten for the methodical handling of SWM. The Government of India has approved a capacity-building initiative for Rs.13.19 crore. Along with other works, this project would construct 5 new Garbage Transfer Stations in Jhalana, Galta Gate, Sushilpura, Vidhyadhar Nagar, Gujjar Ki Thadi, and Pratapnagar <sup>[28]</sup>.

**Disposal-** Waste is carried and then stored after it has been collected. JMC trucks gather the rubbish from municipal containers and transport it to one of the city's five or six transfer facilities. Waste collected from roads and bins in Jaipur is hauled directly to the final disposal site, Mathuradaspora dump yard, which is 50 hectares and 60 kilometres outside Jaipur city. Another is Sewapura, a 45-hectare location located around 20 kilometres from Sikar road, where 700 hundred MT of rubbish is dumped per day <sup>[29]</sup>. Which comprises 400 metric tonnes of trash, of which 250 metric tonnes of organic waste were used by Infrastructure Leasing and Financial Services (IL&FS) to make vermin compost and the remaining 150 metric tonnes are a crude dump. Ultra

Tech Cement, a company based in Langariya, received 100 MT of inorganic waste for its RDF (Refuse Devices Fuel) plant<sup>[30]</sup>.

**Disposal of MSWM in Jaipur-** Today, the quality of the environment in our globe is decreasing due to the production of solid waste in metropolitan areas<sup>[31]</sup>. During the COVID-19 pandemic, public commitment is required to address new waste management concerns according to the Global Network of Civil Society Organizations for Disasters Reduction, 2020. The need to adequately separate garbage at the source and dispose of non-contaminated wastes in separate containers for transportation to recycling or solid waste management facilities must be emphasised. Even though the city has been under lockdown owing to the unique coronavirus illness (COVID-19) pandemic, the city's principal landfill has been burning for the past 26 days. Sewapura solid waste depot is a gramme panchayat in the Amer Tehsil of Jaipur district. For numerous years, the Jaipur Municipal Corporation has been dumping the city's rubbish in the region. Luniawas, Bhairu Khejda, Hanumanpura, Bishangarh, Deeppura, Lakshminarayanpura, Badharana, Khairwadi, and Mangra Dhani are among the most impacted villages. The Sewapura trash facility also receives wet waste. Methane is formed as it sits there for an extended period. The dumpsite in Sewapura has a capacity of 250 metric tonnes. However, the amount of waste that has accumulated has outgrown the facility's capabilities<sup>[32]</sup>.

**Policy response and implication-** Healthcare and solid management are mostly implemented at the local level, by state and federal regulatory norms. In the light of the COVID-19 issue, this article tells the storey of BMW generation, management, and regulation in India. Within six months of the date of notification of these rules, the Ministry will formulate a national policy and strategy on solid waste management, including a policy on waste to energy, in consultation with stakeholders; promote research and development in the solid waste management sector and disseminate information to States and local bodies; provide training and capacity building to local bodies and other stakeholders, and provide technical guidelines and

project finance to states and local bodies. The criticality of SWM to prevent the spread of diseases is well established historically<sup>[33]</sup>. This is more so for developing countries, where managing MSW in a sanitary way is limited in many cases to only 30–35% of the population, living primarily in urban areas. Hazardous H&MW should be disposed of in medical incinerators, and if found in MSW landfills, this is due to inappropriate disposal at general waste collection points or to unscrupulous contractors attempting to take advantage of the difference in tipping fee between landfills and incineration facilities. It also suggests cost-effective waste management strategies that can be recommended to the appropriate authorities for adoption.

## CONCLUSIONS

In early 2020, Coronavirus (COVID-19) began in India and after an investigation was designated an emergency in India. Although different countries will require different approaches, concentrating on the humanitarian character of the situation and tackling infodemic issues are the two most important aspects of future global mitigation efforts. Stakeholders have numerous hurdles in terms of efficient and effective waste management procedures during the Coronavirus outbreak (COVID-19). Waste processing is also a challenge that local governments, such as Nager Palika and municipal corporations, should address appropriately.

This type of review paper help to understand that not only at the government level but at the individual level, it is necessary to bring a behavioural change during garbage generation and disposal. These behavioural changes through proper healthcare waste management will bring value to national economies.

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**Research concept-** Dr. Yashoda Saini

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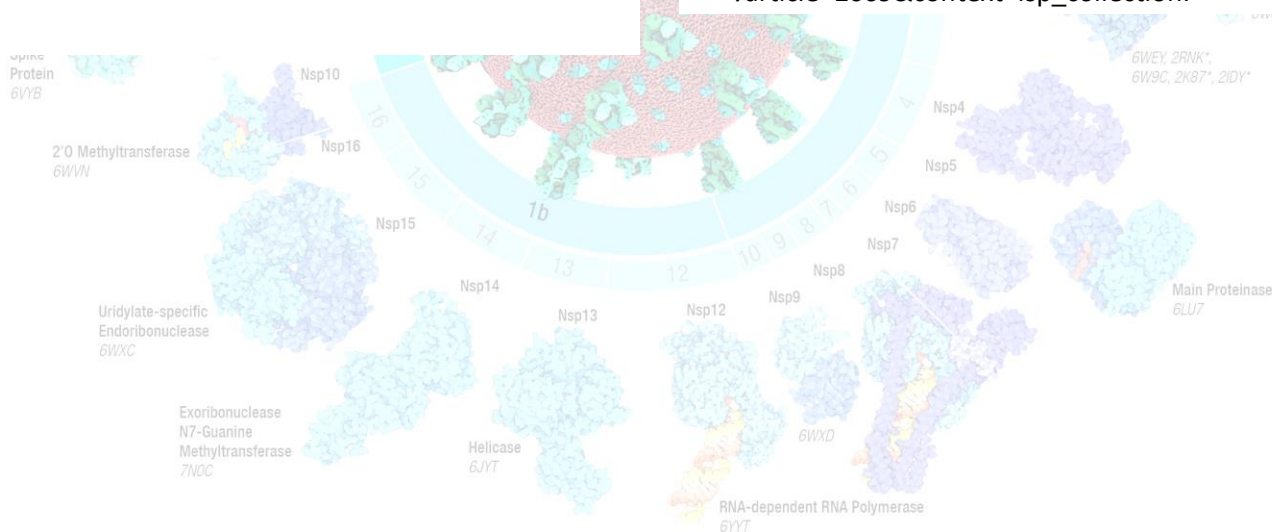
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