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How to find the Appropriate Legislative System and Organizational actions for Delhi's Okhla Dump for Municipal Solid Garbage

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Abstract - It is estimated that only 78% of the 9,600 tonnes of MSW generated by Delhi is collected, 9% is treated by composting, and the balance gets dumped ipain one of the three open landfill sites located outside of Delhi (Okhla, Ghazipur, Bhalswa). The current research is based on a field study, combining survey analysis and primary data collection and investigation, that evaluated the method of solid waste management employed at the Okhla Landfill site. With the goal of updating and organising the waste disposal system along scientific lines, this essay investigates the legislative framework and judicial interventions that are being considered to make this a reality. The results of this study show that decentralisation, institutional capacity, and access to sharing waste management knowledge are the critical driver for sustainable waste management.

Keywords - Municipal Solid Waste, Decentralisation, Institutional Capacity, Sustainable Waste Management, Legislative Framework and Judicial Interventions.

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INTRODUCTION

UN-Habitat India (2018) reports that daily MSW production in India is above 145,000 metric tonnes, significantly more than that of several other countries. Approximately 9,600 metric tonnes of carbon dioxide equivalent are produced in Delhi annually (Central Pollution Control Board 2017 of MSW daily; Talyan et al., 2008; Ashwini, 2013). In reality, only around 70-80% of municipal solid waste (MSW) is collected, 9% of collected MSW is handled by composting, and the remainder is left on the streets or in small open dumps and unsupervised public landfills on the outskirts of the city (Talyan et al., 2008). All three of Delhi's active landfills—in Bhalswa and Narela-Bawana, Ghazipur, and Okhla—are completely overflowing (Rozita, 2012). In 1994, work began on the 16.20 acre Okhla Landfill, and in 2010, it was deemed complete (Richa, 2018). While there have been some improvements in recent years, India's abysmal waste management infrastructure is still one of the most pressing SWM issues that necessitates a fresh look and design (Kulshreshta, 2014; Ahluwalia and Patel, 2018; Ashwini, 2013). Due to the serious consequences for human health caused by improper solid waste disposal, which disproportionately affects the most disadvantaged and powerless members of society, this topic has recently risen to the forefront of the environmental justice debate (Martuzzi et al., 2010; Bullard, 1996; Jolly, 2013). Given this context, this research uses field survey data and secondary sources to assess the status of solid waste disposal at the Okhla Landfill site. In the first section of this essay, we take a look at the current situation with the production of solid waste in India and the capital city of Delhi. In this article's second section, we'll look at the rules that the country has put in place for SWM. The data gathered from the field study and observations are analysed in the article's third section, which focuses on the Okhla solid waste management system. Part 4 of the essay explains that the key driver for sustainable waste management is integrated waste management, which prioritises decentralisation, capacity creation, and access to the exchange of waste management knowledge.

METHODOLOGY

This article's research methodology is a synthesis of doctrinal and non-doctrinal approaches, including evaluation of primary and secondary literature, primary data collecting by survey, and interpretation of the results. In order to objectively assess the scope of the solid waste problem and the existing legal framework, a comprehensive literature analysis is conducted. The study's major data was gathered via a field survey of the Okhla landfill and the surrounding area, where researchers spoke with locals from a variety of income brackets and extracted their thoughts via a questionnaire designed

to gauge attitudes about and experiences with MSW management.

THE PROBLEM OF MSW DISPOSAL IN INDIA

Behind only China and the United States, India is the world's third-largest municipal solid waste (MSW) producer. According to a report by the Central Pollution Control Board (CPCB) in 2016–2017 (the most recent report for 2017–2018 lacked submissions from many states), the reported/estimated waste generation in the country is 119,140.9 tons/day, of which 116,685 tons/day are collected, 24,045 tons/day are treated, and 49,836 tons/day are landfilled (Central Pollution Control Board, 2017). The numbers show not only the enormous amount of garbage that is produced, but also the vanishingly small amount that is recycled or otherwise disposed of properly. As a result, in India, municipal solid waste (MSW) is dumped at landfills as a final disposal method. There have been a total of 994 landfill sites found, 107 of which have been constructed, 77 of which are still in the building phase, 204 of which are operational, 7 of which have been wasted, and 8 of which have had their capacity limited. The report goes on to say that out of the total of 2120 landfills, 40 have been exceeded and 21 have been converted to landfill, which is a sombre reflection of strict adherence to MSW Rules 2016.

Municipal Solid Waste Administration in Delhi

The MSW (management and handling) rules of 2000 state that it is the duty of individual municipalities to handle the waste collection, sorting, storage, transportation, processing, and disposal of municipal solid waste. Delhi produces the most garbage of any city in India, at 9,600 tonnes of municipal solid waste per day. Roughly 550–600 grammes of municipal solid waste are produced daily per person. There is a vast system of formal and informal participants in waste collection. Delhi is home to as many as 100,000 rag-pickers, and if each one is responsible for collecting just 50 kilogrammes of trash per day, that would reduce the city's waste treatment and disposal needs by 1,200 to 1,500 tonnes per day. The areas serviced by the Municipal Corporation of Delhi (MCD) make use of several different kinds of trash cans, including the following:

- Large storage containers made of stone; referred to as "Dhalao" in the region.
- Metal containers of both the covered and open variety
- FRP Bins, which are large, wheeled plastic containers, are commonly used.

The Planning Commission predicts that more than 80% of garbage is dumped in an unsanitary fashion at dumps, increasing the risk of disease and degrading the quality of the local ecosystem. Approximately three of MCD's Compost Treatment Plants for Municipal Solid Waste (MSW) have been in operation at 1 Okhla, treating 200 tonnes per day (TPD) of garbage since they were set up.

1. MCD's Okhla, which treats 200 TPD patients, was established.
2. Bhalswa, under the supervision of a private developer (Nature Waste Management India Limited), which treats 300 TPD
3. Agricultural Produce Marketing Committee (APMC) employees manage Narela's 100 TPD capacity (Mudgal, 2015).

An intricate legal framework has been developed to effectively manage the waste. In what follows, we'll evaluate the regulatory environment of SWM.

THE LEGAL STRUCTURE UNDERPINNING MUNICIPAL SOLID WASTE MANAGEMENT

Part III and Part IV of the Indian Constitution are where the concept of MSW first appeared in Indian law. At first, India's founding document lacked a clause devoted to environmental safeguarding and improvement. Provisions for enhancing the outlines of fundamental duties and directive principles as outlined by Aijaz (2006) and Jolly (2000) were not codified into law until 1976, when the Constitution (Forty Second Amendment) Act was passed. The 74th Amendment, which gave more power to local bodies like Municipal Corporations, Municipal Councils, and Nagar Panchayats based on population size, was a major step forward for SWM in India. It guaranteed the autonomy, authority, and power of levying taxes of these bodies, including duties, tolls, and fees, for the purpose of providing public healthcare, conservancy, sanitation, and SWM services (Aijaz, 2006; Bhada, 2005).

In a landmark decision, the Delhi Garbage case, B.L. Wadhera v. Union of India1, brought attention to the serious environmental threats facing India's capital. Several mandates have been issued by the Indian Supreme Court (SC). The Supreme Court has recently issued a significant directive with regards to landfill sites, ordering the transfer of two sanitary land fill (SLF) sites to MCD and directing the revitalization and operation of the Okhla Compost Plant. The court issued directives to Urban Local Bodies in the case of Almitra H. Patel & Anr. v. Union of India & Ors2. These directives concern the proper management of solid waste in urban areas. The Supreme Court of India has also highlighted the "right of a citizen of India to live in a clean city and emphasised the statutory obligation of Municipal Corporation for efficient management of solid waste of the cities." The judge appointed an investigative panel to look into the situation. The MSW (management and handling) Rules were enacted under the Environment Protection Act, 1986 on September 25, 2000, after the Ministry of Environment and Forest (MoEF), Government of India, received the Committee's report. However, it is crucial to remember that India did not have a

dedicated legal framework to address SWM issues until the year 2000.

MSW (management and handling) Rules, 2000

The Rules' primary objective was to establish scientific procedures for the efficient disposal of MSW (Asnani et al., Improving MSW Management in India: A Sourcebook for Policymakers and Practitioners, 2017; Ministry of Environment Forests and Climate Change, 2000). All local governments are bound by the regulations established in 2000 if they are responsible for managing MSW in any way: collection, storage, segregation, transportation, processing, or treatment (Asnani, 2004). For instance, the CPCB reportedly indicated that just 68% of rubbish in India's urban areas had been collected in 2013. (The Municipal Solid Waste (Management and Handling) Rules, 2000) Among the most important clauses are: Landfilling of non-biodegradable, inert waste and other wastes not suitable for recycling or biological processes shall be permitted; the landfill site shall be designed for 20-25 years; the landfill site shall be distant from habitation clusters, forest areas, water bodies, monuments, national parks; the landfill shall be fenced with a proper gate at the entrance for monitoring incoming wastes/vehicles, to prevent the entry of cattle, to keep record of such activities; and the landfill shall be located in an

- Discarded items must be covered with 10 centimetres of dirt either immediately or at the end of the workday.
- Before the monsoon season begins, the dump should be covered with compacted dirt 40–65 centimetres thick to keep moisture out.
- The quality of the surrounding air and groundwater will be monitored in close proximity to the dump (Central Pollution Control Board, 2008).

OKHLA LANDFILL – WASTE DISPOSAL-OBSERVATIONS AND FINDINGS

South Delhi Municipal Corporation of Delhi manages the Okhla Landfill (Jain, 2010). Initially covering 16.20 ha of land, this landfill was deemed full in 2010. (Kumar and Pandit, 2013). Nonetheless, because there were no other options for waste management, the Okhla Landfill remained a hotspot for trash. Since the criteria, guidelines, and rules related Landfills did not come into effect until after the year 2000, it must be stressed that none of the currently active landfills in Delhi qualify as a genuine landfill (Asnani et al., 2022). In November of 2021, a large fire broke out at the Okhla dump site, causing extensive damage to the environment and endangering the lives of countless people. What's more, in 2017, two people were murdered and dozens more were injured when a portion of Delhi's oldest dump site, Ghazipur, fell (Sunny, 2021). Since the Okhla landfill site had reached the end of its usefulness, the South Delhi Municipal Corporation no longer dumped trash there (Sharma, 2018). With this in mind, the city council has set a goal of transforming the former Okhla dump site into a lush green area within the next year and a half.

Researchers made multiple trips to Okhla Landfill in an effort to learn how strictly the MSW laws had been followed there. It has been discovered that the necessary MSW disposal liner and cover systems have been removed from the landfill site. Every last bit of municipal solid waste (MSW) has been dumped and scattered on the ground, leading to garbage mounds that are 20-24 metres high in several locations. There isn't an official recycling centre, but there are rag-and-bone men working the streets. The SWM Rules, 2016, state that a landfill site should sooner be used only for depositing inert trash and discards; however, it was seen that various types of wastes were getting dumped at Okhla Landfill, which is in direct violation of these regulations. In many cases, landfills lacked proper fencing or walls around their perimeters to prevent trespassing.

There was no nightly covering of the landfill cell with soil or inert waste products. Considering the size and depletion of the waste site, it was not possible even five years ago. Numerous landfill fire occurrences in Delhi corroborate the notion that there were no adequate fire extinguishers on the premises, making it potentially one of the dangerous places. Such is recognised in the Recommendations for the Long-Term Action Plan for SWM in Delhi (Delhi State Legal Services Authority, 2017). No attempt is made to quantify the average daily MSW dump volume. Despite claims from government employees that the landfill site is closed as per the judgement of the South Delhi Municipal Corporation in 2022, illicit MSW dumping continues unabated.

Against this backdrop, the study used a structured questionnaire approach and field observations to assess the level of public knowledge regarding SWM, with a focus on Okhla landfill. Given the constraints of our investigation, 200 locals were chosen as a representative sample. Therefore, for the same, a suitable sampling clustering of residents within a 5-kilometer radius was used. Government agencies, their employees, and non-governmental organisations (NGOs) were all interviewed in addition to being polled. The interviews were used to glean expert opinions and data. The primary data was gathered from NOVEMBER 2021 through 2022.

Table 1: Summarises the methods used to answer each cluster of survey questions

Survey question	Data collection method
1. What is the kind of solid waste generation, collection, and disposal method followed by the residents near Okhla Landfill.	Survey with residents nearby to Okhla Landfill; and observations
2. What are the impacts and consequences suffered by the residents as a result of landfill?	Survey with residents nearby to Okhla Landfill; and observations
3. What is the level of participation and willingness on the part of residents to contribute to solid waste management?	Survey with residents nearby to Okhla Landfill; and observations

Socio-economic/demographic characteristics of respondents

A total of 138 men and 62 women from the general population were interviewed using a structured interview tool to gather quantitative and qualitative data. In Table 2, we see the respondent's demographic information.

Table 2: Age profile; solid waste survey

Gender	18–28 years	28–48 years	Above 48	Total
Males	70	54	14	138
Females	20	34	8	62
Total	**90**	**88**	**22**	**200**

Solid waste generation, collection and disposal method followed by the residents near Okhla landfill

When asked how much garbage their household produces daily, most respondents put the number between 500 grammes and 1.5 kg. In addition, we inquired as to how their trash was disposed of. The purpose of this inquiry was to determine if residents of Okhla take the time to put their trash in cans for collection. While 96% of respondents do indeed separate their trash into several containers before dumping it, the other 4% do not.

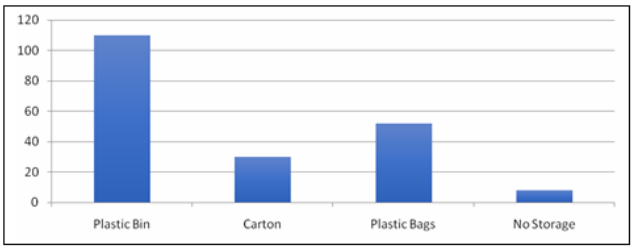

Figure 1: Different types of storages used by the respondents (see online version for colours)

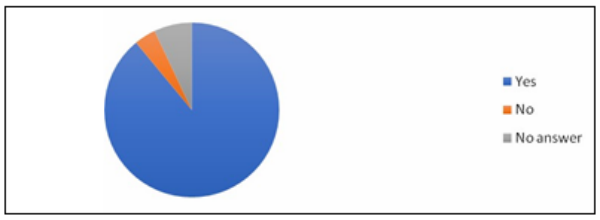

Figure 2: Waste segregation practices (see online version for colours)

Sixty percent of respondents get their trash hauled away by a professional service, while twenty percent take their garbage to a dump and the remaining twenty percent simply dump it outside. The majority of people who use plastic bags to carry their trash dispose of them in inappropriate areas. The level of contentment with Okhla and Delhi's general garbage management system was surveyed. Most people (95%) said no. Corruption and the improper execution of legislation by towns, a lack of awareness, and a culture of cleanliness were all cited as contributing factors. Additionally, respondents mentioned that the MCD only made sporadic visits and did not conduct any sort of monitoring in their neighbourhood. As far as I could tell, trash dumping and littering were commonplace. It's largely due to people dumping garbage on the ground or into open drains in public spaces; this is especially true of slum residents, low-income families, and local businesses. Programs designed specifically to raise awareness should be expanded. Roads should be cleaned everyday, if not more frequently.

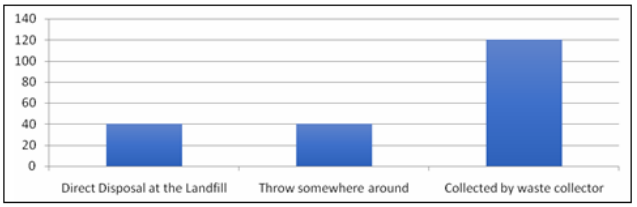

Figure 3: Solid waste disposal method among residents near Okhla landfill

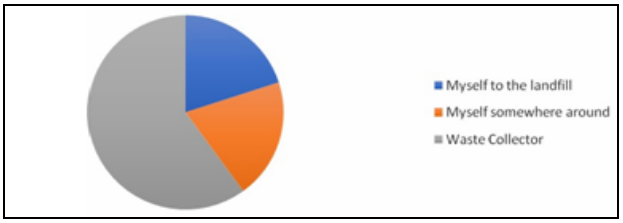

Figure 4: Responses on who takes the waste from the respondents' premises for disposal

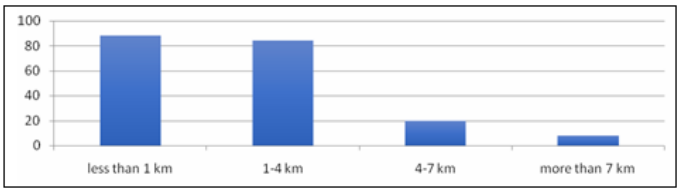

Figure 5: Distance of residence of the respondents from the landfill

The survey's primary focus was on how the landfill affected those who lived nearby, as well as how much people knew about the landfill and how eager they were to see it removed. An eyesore, a source of food for mosquitoes, rodents, flies, etc., and a drag on real estate and property values, solid waste disposal in the open areas is a major problem. It pollutes the air and has other detrimental effects on people's and the planet's way of life. As a result, it has contributed to the spread of diseases including the plague, typhoid, diarrhoea, and others. Overall, the landfill is bad for people's health, wealth, and environment since it pollutes water sources (both above and below ground), turns organic matter into harmful substances, and contributes to global warming (GHG). The proper application of knowledge, tools, and effective management techniques, however, can convert garbage into something beneficial.

Only 10% of those polled said they had experienced no negative effects from the waste. These were primarily residents of areas further than 5 kilometres from the landfill. However, when asked direct questions about the landfill's impact on their health and the environment, they responded positively. Forty percent of those polled reported being very affected by the dump, while another quarter reported being somewhat affected. Malaria, the common cold, typhoid, diarrhoea, jaundice, etc. have all been reported by survey takers. People are misinformed, reluctant, and lack the financial capacity and economic resources to have doctors visit their homes to check for diseases.

CHALLENGES AND MITIGATION

The analysis confirmed that there is a lack of oversight regarding ethical and sustainable operations at the Okhla dump site. Current waste management practises, in which large quantities of mixed trash are amassed and trucked off to a landfill for disposal, are neither sustainable nor acceptable from a social and ecological standpoint. Even now, the landfill poses a serious risk to the local population, ecosystem, and water supplies. Since the current landfill disposal method utilised in Okhla was shown to be risky and unmaintainable, there are some things to think about. One strategy for improving the scientific management of landfill sites is to learn from what other countries are doing right. The availability of sufficient area for landfills is essential for such an implementation (Annepu, 2012). The current national scenario, however, presents significant challenges to identifying suitable alternate waste locations. For instance, if New Delhi's Ghazipur Landfill site doesn't pan out, the Municipal Corporation proposed setting aside 42 and a half acres of land at Ghonda-Gujran Khadar and Wazirabad for a new landfill there instead (Singh, 2019). However, the idea ultimately failed because to the violent protests of environmentalists and locals.

In this case, the solution still lies in a concerted and all-encompassing effort to address each and every aspect of SWM. In addition, other treatment technologies for landfill will need to be adopted on a massive scale as suggested by the White Paper on Pollution in Delhi published by the Union Ministry of Environment and Forests, which details the various pressures on land and the pollution of ground and surface water from landfills in Delhi (Ministry of Environment & Forests, 1997). Due to the low heat value of garbage in Delhi, incineration is not supported, while composting is seen as the most practical solution. However, sorting trash at the source is crucial to make composting a reality. Delhi should commit to developing decentralised and semi-decentralized systems for processing, treating, and disposing of MSW in accordance with the Long-Term Action Plan for SWM in the city (Delhi State Legal Services Authority, 2017). Considering that Delhi is home to 16 million people and its three landfills take up around 66 hectares combined, this information is crucial because the city's population density is significantly higher than that of other developed nations (Swaminathan, 2018). Decentralized block management would go far toward encouraging decentralisation and efficiency as opposed to the current centralised system which adds to higher transportation costs and would require more extensive infrastructure (Swaminathan, 2018). The committee suggested that a landfill tax be instituted to reduce waste disposal on farmland (Delhi State Legal Services Authority, 2017).

CONCLUSIONS

Given the rapid pace of urbanisation in Delhi, this article persuasively argues for the need to update and make operational the MSW management and disposal system along scientific lines in light of the existing legislative framework, MSW practises, approach models, and implementation of judicial interventions. The results of this study show that decentralisation, capacity building, and access to the sharing of MSW management knowledge contain the critical driver for sustainable MSW management. After analysing the data and making certain observations, it is clear that Delhi generates more MSW each day than several countries. This amount is staggering and is measured in metric tonnes. Unfortunately, only a small fraction of MSW is collected, managed, and treated, which has had devastating effects on human health and disproportionately harmed the most disadvantaged and marginalised members of society by denying them access to environmental justice. Despite the Supreme Court of India's (SC) jurisprudence under Part-III and IV of the Indian Constitution, there is no specific provision for promoting and protecting the environment, therefore the landfill site irresponsibly becomes the final procedure for MSW in Delhi, India.

However, the environmental justice issue and the empowerment of local bodies like Municipal Corporations, Municipal Councils, and Nagar Panchayats have been progressively addressed and dealt with by the 42nd and 74th Amendments to the Constitution of India and the laws, rules, and institutions enacted and created thereunder. Unfortunately, the pollution level, water quality, air quality, vegetation in and around the landfill site, landfill closure, landfill post-closure, landfill monitoring and supervision, etc., have not improved significantly. Community involvement, through the dissemination of information on the significance of MSW segregation at the source, could supplement the insufficiency of municipal authorities' resources to manage MSW, with the potential outcome of reducing the burden on disposal sites.

The government of India needs to encourage and incentivize universities, educational institutions, and technical institutions to include MSW management in their curricula. For the purpose of educating the public and characterising MSW in order to develop site-specific solutions for MSW management, these educational institutions must also adopt communities

in their proximity. In light of the Indian government's decision to transform 100 cities into "smart cities," state and municipal governments have been tasked with updating their SWM plans to better accommodate the needs of modern citizens. Municipal solid waste management in Delhi needs to be rethought and reinvented so that it can process MSW in a way that is effective, efficient, and in line with international standards. Therefore, it is imperative that all homes, municipal facilities, and institutions source separate their MSW so that it may be recycled. Since there is a shortage of space for dumping municipal solid waste and current landfill sites are at capacity, the federal government has plans to eliminate landfills in 20 major cities. According to the preceding debate, if municipal bodies allow rag-pickers to segregate waste at source and recycle it, and if they promote the construction of compost pits in all the communities for processing the organic waste, then roughly 80% of the MSW at Okhla disposal sites might be recycled.

Further, effective MSW management is influenced practically by the participation and engagement of the community and civil society. Now more than ever, a comprehensive waste management system that is both financially feasible and infrastructure-friendly is essential.

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