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SOLID WASTE MANAGEMENT IN CITIES AND TOWNS OF INDIA: IMPERATIVES FOR IMPROVEMENT

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***Abstract*:** *Across India, existing systems for the collection, transportation and disposal of solid waste are mired in chaos. The problem is more acute in the urban areas, where rapidly growing populations generate increasingly larger quantities of solid waste that urban local bodies (ULBs) are unable to manage effectively. Improper management of solid waste poses risks to the environment and public health. This paper dissects the state of solid waste management in India, and offers recommendations to solve the myriad challenges. India's flagship sanitation intervention, set out to end open defecation by October 2019. While the program improved toilet coverage nationally, large regional disparities in construction and use remain. This study based on theoretical backdrop from secondary data.*

Keywords: Solid waste management, Imperatives, Improvement Cities and Towns of India

Introduction

Solid waste management involves collection transportation treatment and disposal solid waste management is regarded as one of the man activities of the Municipalities. The report on the committee appointed by the supreme court of India (1998) under the chairman ship of Asim Barman to suggest measures for solid waste management practices in the country noted that solid waste management is an obligatory function of Municipal government in India. The report revealed that the solid waste management is poorly performed resulting in problems of health, sanitation and environmental degradation and the situation his become worse in the rapidly, growling cities of our community.

The "Useless remains "are described as the waste concise (Oxford Dictionary). It is a by-product of human activity. The waste can be not only in solid but also semi-solid and liquid. The cities and towns which are the primary generators abandon this waste material as there was no compensation for abandonment. The urban solid waste is disposed by the governmental authority at the local as it is its one of the primary responsibilities to maintain cleanliness among the streets of the cities and towns. It is estimated that 20 to 40 per cent of municipality revenue is consumed for collection, treatment and disposal of solid waste in Municipalities, However, 30 to 40 percent of the solid waste generated was often uncollected (Cointreau 1990).

On overage up to 50 percent of Urban dwellers in cities of India have no regular waste collection and street cleaning sources. The present methods of solid waste disposal are through uncontrolled dumping or burning on open ground or city streets in this process valuable resources that can and should be retrieved get lost. The general process adopted in our country for regular collection and removal is disposal of waste at landfill sites. Even where landfills exist, the disposal waste at such places is not done properly. Disposal of solid waste is done in an unscientific manner. Crude open dumping is adopted in low lying areas of pits dug separately for dumping. These landfills are the breeding grounds for flies, mosquitoes and rodents and pose a threat to the health and sanitation of its localities in the urban areas.

During 1990s, the challenge to Municipalities posed by the task of collecting, transporting and disposing solid waste so as to minimize the hazards it posed to human health and environment became more and more daunting. With increase in urbanization lands and GDP growth levels there was not only a quantitative increase of the waste but its physical and chemical nature also became more complex.

The percentage of packaging related waste- paper, glass and metal – went up However, since the housing and sanitation arrangements were not keeping pace with the increasing urbanization, the solid waste is being mixed with the biodegradable kitchen waste was likely to become contaminated with human excrement. Finally, the virtual absence of or weak enforcement of regulation control on small scale units manufacturing petroleum products papers, electrical goods are also dumped with household waste.

Types of Waste Produced by Cities and Towns

The World Bank Project report on "Environmental management of Urban solid waste in Developing countries in 1982 had categorized the solid waste generated by the cities into households, commercial and industrial premises institutions and public streets, the rejected construction material and slaughter house waste that are generally noticed and found in the streets of the cities. Since waste is a by-product of production and consumption, in a thickly populated country like India the quantity of waste produced by the cities is on its high float up.

Disposal of being Waste

In India among cities and towns of our country the amount of human waste that is co-disposed with municipal solid waste is small as compared to the garbage generated by the cities every day issues relating to its safe disposal need to be considered.

The high economic return in the small scale manufacturing sector in cities of our country have been had a magnetic importance on young men and women from the rural areas of Bihar, Haryana, Punjab and Rajasthan migrating to Delhi, people from Tamilnadu, Andhra Pradesh and Uther Pradesh migrating to Mumbai and from Assam, Orissa and Andhra Pradesh. Marketing to Kolkata every year in search of employment that are easily available in the unorganized sector of country's vibrant economy. Since most of the migrants are illiterates and unskilled can only find a place in the shims and on the pavements.

This kind of abnormal increase of illiterate and unskilled low income population in cities not only increases the density of population but also create pressure on civic services. The massive increase of population in urban slums has led to encroachment of public land and further resulted in creation of unauthorized colonies. Providing sewerage facilities in the slums and unplanned settlements has become difficult to the corporations and municipalities. Since the sewerage services are poor in these slums and unauthorized settlements. The sanitation related options for the residents of such areas are a private onsite or community on-site facility of open defecation.

In these thickly populated hutment colonies it may not be possible to accommodate septic tanks, the alternative is a small pit or a loose receptacle, a basked or a bucket that has to be regularly emptied for which a spot on the public street or a waste collection centre is used.

It is significant form the finding of the workshops and conferences conducted on solid waste management by different corporations have listed open defection as one of the sources of the problems in the cities. The community toilets are not fully utilized due to a variety of reasons. The Sulabh International toilets and bathing, facilities at nominal casts to users in slum areas are also by-pared became they are considered to be too expensive, too far and too dirty.

Review of Literature

There is a large volume of literature on the different aspects of SWM in India. For example, in this paper, "Solid Waste Management in India: A Critical Review," Prof. Sudha Goel (2008) suggests that regular monitoring and data collection are essential for designing an efficient SWM system in her study. To improve SWM practices in the country, Goel recommends establishing a centralized database on ULB experiences in SWM, and using modern tools and technology such as remote sensing, GIS and mathematics optimization.

Rajkumar Joshi and Sirajuddin Ahmediv (2016), argue that lack of awareness and technical knowledge, inadequate funding, and ineffective implementation of laws and policies are the reasons for the failure of Municipal Solid Waste Management (MSWM). Som Dutta Banerjee,v for his part, highlights the challenge of infrastructure. Banerjee argues that private participation in SWM must be encouraged to ease the burden on the public coffers.

Chavan and Zambarevi(2013) have also observed that the essential inadequacies of SWM in India are in treatment methods and techniques. In his paper, "Sustainable Solid Waste Management in India," Annepuvii explores ways to reduce the quantity of solid waste. In Mumbai alone, the open burning of solid wastes and landfill fires emit nearly 20,000 tonnes per year of air pollutants on land. Amongst other ways to repurpose waste, such as by creating fly-ash bricks, Annepu recommends the integration of informal recycling into the formal system by training and employing waste-pickers for the door-to-door collection of waste, and allowing them to sell the recyclables they collect.

` Gopal Krishna (2018) in his paper, "Why Urban Waste Continues to Follow the Path of Least Resistance," argues that SWM cannot improve unless institutional and financial issues are addressed. Krishna criticises the 2016 SWM Rules, framed by the MoEFCC, Government of India, stating that they fail to make any provision against the NIMBY syndrome or provide a mechanism for the implementation of Extended Producer Responsibility (EPR)

The authors' proposed a decentralized approach to SWM, along with appropriate technologies to solve the problems of processing and treating waste. The paper suggests that the rules should incentivize systems where producers minimize waste and take responsibility for the reuse and/or recycling of used products.

Objectives:

To Study the Solid waste (SWM) in Cities and Towns.
To understand the Solid waste management (SWM) in Cities and Towns.
To know about the processing of disposal of solid waste for future practice.

Methodology

` The study state, India, had a population of over 134 crore people in 2011. the important aspect was low-income states in India, but continues to lag behind India's average in terms of social, economic, and health outcomes. Approximately 51% of the state's Scheduled Caste (SC) households the lowest rung of the traditional caste ladder lives in poverty. The country's informal sector plays a huge role in waste management. However, informal-sector workers are not officially recognized and lack legal status and protection. They collect more than 10,000 tunes of reusable waste every day, without protective equipment such as gloves and masks, and often even the essentials of uniforms and shoes.

One key aspect of efficient SWM is "waste segregation." It is now mandatory for waste generators to deposit their waste in colour-coded bins blue for dry waste and green for wet waste to ensure proper recovery, reuse and recycling. This reduces the burden of SWM on ULBs significantly. Wet waste is used for composting or bio-methanation in a decentralized manner. Tamil Nadu has achieved 100 percent segregation in 20 of its 50 smaller municipalities, and 80–90 percent in the rest. However, in most states, the mixing of segregated and unsegregated waste remains a serious problem. To motivate people to segregate their waste, the MoHUA launched a "Source Segregation Campaign" on World Environment Day 2017, under the Swachh Bharat Mission. Under this Campaign, all cities and towns were to adopt "source segregation" as a mass movement. Based this data the researchers study the major progress of soiled waste management impressively. Shows the tables in below.

Table-1: Solid Waste Management in Indian Cities (2016 to 2020)

	First Survey	Second Survey	Third Survey	Fourth Survey	Fifth Survey
Year	2016	2017	2018	2019	2020
Cities Covered	73-all million plus	434-Amrut Cities	4,203-ULBs+61 Cantonment Boards	4,237 ULBs + 62 Cantonment Board	4242 ULB+62 Cantonment Board + 92 Ganga Towns
Location	3,000+locations in 73 million plus cities	17,500 locations in 434 cities and towns	2.5 lakh survey locations	6.53 lakh survey locations	6,01,519 survey locations
Impact	NA	NA	40 crores lives	43 crores lives	
Top Five Cities	Mysuru Chandigarh Tiruchirappalli New Delhi Municipal Council Visakhapatnam	Indore Bhopal Visakhapatnam Surat Mysuru	Indore Bhopal Chandigarh Vijayawada Mysuru	Indore Ambikapur Mysuru Ujjain New Delhi Municipal Council	Indore Surat Navi Mumbai Vijayawada Ahmedabad

Source: MoHUA, 2020

In urban areas of the country, across 4,242 ULBs (urban Local Bodies), 62 cantonment boards, and 92 Ganga towns under the aegis of SBU (Static Batch Unit). The objective of the survey was to sustain the on-ground performance of cities along with continuous monitoring of the service level performance when it comes to cleanliness. The results were declared in Madhya Pradesh retaining the first position. Surat in Gujarat and Navi Mumbai in Maharashtra grabbed the second and third positions, respectively. Varanasi in Uttar Pradesh was the best Ganga town surveyed, while Patna and Gaya in Bihar were declared the dirtiest cities in the country. This is data based on secondary data source.

Table-2: Solid Waste Generation and Composition (2016 to 2020)

States/UTs	Total Wards	Total Waste Generation (MT/D)
Andhra Pradesh	3,409	6,141
Andaman and Nicobar	24	90
Arunachal Pradesh	75	181
Assam	943	1,432
Bihar	3,377	2,272
Chandigarh	26	479
Chhattisgarh	3,217	1650
Daman & Diu	28	32
Dadra & Nagar Haveli	15	55
Delhi	294	10,500
Goa	217	250
Gujarat	1,427	10,274
Haryana	1,496	4,783
Himachal Pradesh	497	377
Jammu & Kashmir	1,081	1,489
Jharkhand	932	2,135
Karnataka	6,464	10,000
Kerala	3,536	2,696
Madhya Pradesh	7,115	6,424
Maharashtra	7,322	22,080
Manipur	306	174
Meghalaya	114	268
Mizoram	264	236
Nagaland	234	461
Odisha	2,024	2,721
Puducherry	122	415
Punjab	3,123	4,100
Rajasthan	5,389	6,500
Sikkim	53	89
Tamil Nadu	12,814	15,437
Telangana	2,112	8,634
Tripura	310	450
Uttar Pradesh	12,007	15,500
Uttarakhand	1,170	1,589
West Bengal	2,938	7,700
Total/Average	84,475	14,7613

Source: MoHUA, 2020

Solid waste can be separated into three categories: (i) biodegradable waste or organic waste (food and kitchen waste, green waste vegetables, flower, leaves, fruits and paper, etc.), (ii) inert and non-biodegradable waste (construction and demolition waste, dirt, debris, etc.) and (iii) recyclable waste (plastic, paper, bottles, glasses, etc.).

Table 3: 100-percent Source Segregation by Wards under SBM (Swatch Barath Mission) Source: MoHUA, 2020.

States/UTs	Total Wards	Ward with 100% Source Segregation
Andhra Pradesh	3,409	3,300
Andaman and Nicobar	24	23
Arunachal Pradesh	75	11
Assam	943	368
Bihar	3,377	1,107
Chandigarh	26	24
Chhattisgarh	3,217	3,217
Daman & Diu	28	28
Dadra & Nagar Haveli	15	15
Delhi	294	59
Goa	217	173
Gujarat	1,427	1,187
Haryana	1,496	935
Himachal Pradesh	497	490
Jammu & Kashmir	1,081	137
Jharkhand	932	752
Karnataka	6,464	3,694
Kerala	3,536	3,536
Madhya Pradesh	7,115	7,005
Maharashtra	7,322	6,346
Manipur	306	196
Meghalaya	114	27
Mizoram	264	230
Nagaland	234	30
Odisha	2,024	1,402
Puducherry	122	116
Punjab	3,123	2,664
Rajasthan	5,389	4,419
Sikkim	53	50
Tamil Nadu	12,814	10,891
Telangana	2,112	1,008
Tripura	310	243
Uttar Pradesh	12,007	8,294
Uttarakhand	1,170	669
West Bengal	2,938	558
Total/Average	84,475	63,204

The new SWM rules of 2016 have mandated the door–to-door collection of segregated waste, with waste generators obligated to pay a "user fee" to the waste-collectors. However, the rules do not provide details on how the fee is decided—whether it is charged based on the quantity or type of waste generated. Rendering to the "Swachhata Sandesh Newsletter," 81,135 wards (96.05 percent) out of 84,475 wards across India have achieved 100 percent door-to-door waste collection as of January 2020, including all wards in Andhra Pradesh, Arunachal Pradesh, Chhattisgarh, Goa, Gujarat, Karnataka, Madhya Pradesh, Mizoram, Rajasthan, Sikkim and Uttarakhand. At the city-level, Mysuru has made significant progress in this area, as well as in source segregation.

Conclusion

Thus, a part of solid waste management efforts and in the context of human waste which calls for hygienic, culturally appropriate ecologically sound practices, the initiatives of the government left much to be desired. However, there was some hope for the future, due to an extended opportunity for introspection by the concerned authorities. The Government has imitated steps to transfer the water and sanitation. to prepared a feasible programme of immediate actions, works, supply of equipment, and technical assistance for effective implementation of the solid waste management programme and the Government have been trying their level best to according to fast growth of slums and take sufficient care of the existing slum dwellers with special reference to provide adequate sanitation facilities utmost privacy to the people in the cities and towns of our country it is helpful of increase the better quality of the family life and progress of the health.

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