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Solid Waste Management: A Case Study of Nagpur City

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Abstract: ***The objective of this paper is to examine the waste management of Nagpur city. Nagpur is one of the largest market place in India with population of 24, 05, 665 NMC has divided Nagpur in total of 10 zones for proper administration. Due to factors like industrialization and urbanisation it is the fastest growing city leading to increase in waste generation. This present case study aims to analyse current MSW management practices and its status and it also discusses the issues related with collection, transportation, treatment and disposal. The goal of this study is to help in minimizing the waste generation and to reduce its impact on humans. It also suggests ways to improve the administration of NMC.***

Keyword: Municipal Solid Waste (MSW), Collection, Transportation, Disposal, Waste Generation, Administration of NMC

I. INTRODUCTION

Modern and unorganized life style is putt nice pressure on natural resources. To cater the requirements of individuals completely different product ar created. The specialised product created by industries demand careful handling and when treatment. it's not solely the merchandise however the packaging that conjointly wants attention. to make awareness amongst individual concerning the improper disposal of solid waste may be a robust job. Disposal of solid waste while not correct treatment imposes negative impact on soil, water, air, human health and aesthetic price. [4] uncollected wastes accumulate on the streets, public areas, vacant heaps, so making outlawed open dumps. Residents may merely throw their wastes at the closest stream or burn them. [7] gift practices concerning solid waste embody disposing waste in low lying areas, selling in vacant place, storing waste in outskirts of town. There ar several issues related to solid waste. The waste is handled while not taking any precautions. In several case of solid waste management it's determined that there's public apathy and lack of co-ordination between completely different civic bodies. [10] the most shortcomings ar associated with inadequate men, money resources, implements, and machinery needed for effectively finishing up varied activities for municipal solid waste management.

Nagpur is one in every of the mandatory cities in region State yet as in central Republic of Asian nation. Nagpur is thought because the "Orange City". Nagpur is that the sub capital of region of geographical area State. Nagpur city has extraordinarily large space. town is found in centre of Asian nation at a distance of 1065 kilometer from urban center and 825 kilometer from Nagpur Municipal Corporation was established in 1951. As per census 2011, the entire population of district was a pair of,405,665. the present population of Nagpur urban agglomerate is over twenty nine lakhs.

It's divided in 10 zones to implement best operating system. it's one among the very best acquisition rates of ninety 91.92% among all the urban agglomerations in Asian nation.

Year	Population Total	Decadal growth rate
1971	8,66,000	
1981	1,217,000	40.53%
1991	1,622,000	33.28%
2001	2,052,000	26.51%
2011	2,405,665	17.24%
2021	2,940,000	

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Population is increasing day by day and with relevancy that the solid waste generation is to boot increasing bit by bit. this can be huge question previous NMC concerning a way to tackle this specific disadvantage. Prediction of solid waste for the city like Nagpur is type of troublesome as a result of the values of the variables changes over the time speedily, Nagpur ULB has received a credit rating of 'A' by CRISIL in 2012. Mumbai. Nagpur is connected with variety of major cities of Republic of India via Air, Trains and Roads. The management of solid waste is that the most significant issue for healthy life style and safer area.

Earlier work: within the previous researches, analysts had baby-faced variety of issues concerning information assortment. a number of the sooner works square measure mentioned below.

Mr.Vatsal Patel conjointly delineate solid waste management a awfully difficult operation since there's too little information of constant. Harit Priyadarshi indicated the failure of exising facilities because of lack of concern, high volume of waste generation and deficient assortment area.

II. METHODOLOGY

An extensive literature survey and statical information analysis square measure the first supply of this report. the fundamental approach was to review the relevant literature with reference to the integrated solid waste management system. the first information gathered here is by personal communications with skilled administrator.

Main Sources: Household waste, industrial waste, Hotels, Clinics and Dispensaries waste, Construction and Demolition Waste, gardening, Sludge.

III. EXISTING SYSTEM

Collection: For the effective management of waste, town has been divided into ten zones. Door-to-door waste assortment is practiced altogether wards, except outer town areas. NMC has privatised assortment and transportation of the solid waste and awarded the contract to Kanak Resources Management restricted (KRML) in December 2007. KRML is answerable for the door-to-door assortment of waste and transportation of waste to the wasteyard at Bhandewadi. the present contract for KRML expires in could 2018. The vehicles deployed for door-to-door assortment activities embrace handcarts, wheeled vehicle rickshaws, automotive vehicle tippers, and tiny trucks (Tata 407). underneath the "Bin-Free City" programme of NMC, variety of community bins are reduced and eliminated and most of the rubbish collected from numerous residential, industrial and institutional areas is directly transferred to the waste assortment and transportation vehicles, that act as moving waste receptacles.

Street Sweeping: Street sweeping and drain cleansing is finished by in-house workers of NMC. the whole length of road for street sweeping is concerning 3,400 km. Street sweeping operations square measure administrated within the morning and evening in 2 shifts, i.e. 6.00 am to eleven.00 am, & 3.00 pm to 6.00 pm. a mean street length of 700 m (max 900 m and minimum five hundred m relying upon the density of the population) per employee is sweptback daily.

Secondary Storage System-Nagpur had adopted the concept of a "Bin-Free City" as far back as 2008, which resulted in a bins from 700 in 2008 to one hundred seventy in 2017 (approximately eightieth reduction). Bins/secondary assortment points are provided solely within the areas with continuous endeavor. Additionally, there are nine transfer stations earmarked in varied zones, that conjointly function storage device points. The transfer station in zone three is mechanised, whereas the transfer stations in different zones ar non mechanised and open, resembling an outsized waste storage purpose.

Zone No.	Zone Name	No.of secondary points	Transfer station
1	Laxmi Nagar	20	Sita Nagar(T) Rahate colony(T)
2	Dharampeth	19	Ambajhari T point (T)
3	Hanuman Nagar	14	Budhwari Bazar, Sakkardara(P)
4	Dhantoli	30	Ganeshpeth (T)
5	Nehru Nagar	12	Taj Bagh(T)
6	Gandhi Bagh	15	Sokhta Bhawan(T)
7	Satranjipura	16	
8	Lakadganj	10	Gangabai Ghat (T)
9	Ashish Nagar	13	Gangabai Ghat (T)
10	Mangalwari	21	Chaoni Chowk(T)

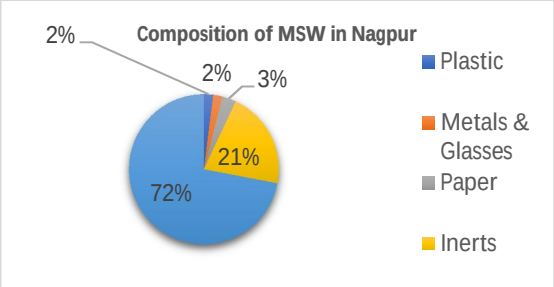
T=Temporary, P=Permanent

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1) *Transportation:* NMC has three kinds of transportation vehicles for assortment of MSW from the town space. The vehicles used for assortment of MSW are noble gas, General Machine and Compactor. The quantity of MSW of the Nagpur town that reaches the garbage dump is around 1000-1100 TPD (excluding the quantity of waste being processed that is around 150-200 TPD).

Zone E.No.	Zone name	No. of Prabhag	JCB Machine	Tipper	Rickshaw
1	Laxmi Nagar	7	1	6	76
2	Dharampeth	6	0	3	55
3	Hanuman Nagar	8	1	1	47
4	Dhantoli	6	1	3	57
5	Nehru Nagar	7	0	2	69
6	Gandhibagh	7	1	3	73
7	Sataranjipura	8	1	1	72
8	Lakadganj	8	0	2	40
9	Ashish Nagar	8	0	0	75
10	Mangalwari	7	1	2	79
	Total	72	6	23	643

2) *Treatment:* Presently, there's no operating waste treatment facility in Nagpur. Waste collected from varied elements of the town is drop at Bhandewadi garbage dump, that is approx. ten kilometer from the town centre. Within the year 2009, NMC awarded the work of treatment and process of municipal solid waste to M/s. Hanjer Biotech Energies Pvt. Ltd., Mumbai. roughly eleven acres of land was hired to M/s. Hanjer Biotech Energies Pvt. Ltd. for development of the composting and Refuse Derived Fuel (RDF) primarily based process facility. The contract was awarded on a Build, Operate and Transfer (BOT) basis for twelve years. the primary 2 years were for construction and development, and therefore the remaining ten years for operation and maintenance. the entire cost of capital for the project was Rs. twenty six crores (Euro three.60 million) and therefore the tipping fee paid by NMC was Rs275 (Euro three.81) per metric weight unit.



3) *Disposal:* The site is encircled by habitation on 3 sides (east, north and west), a waste treatment plant to the southeast, and a composting and RDF plant developed by Hanjer to the south. The Bhandewadi dumping site has been operational since the year 1968 and has been earmarked as a compost yard altogether the event plans for the town since then. It's calculable that quit 18,00,000 MT of waste has been dumped at dumping site since its origination. Men at the positioning includes 1 sanitary inspector, 2 supervisors and 26 labourers of NMC. Consistent discussions with the positioning responsible, we got to know that about a hundred and fifty to two hundred (150-200) ragpickers collect recyclables from waste on dumpsite.



IV. SUGGESTION

1) Sorting stations can be created at the dump yard and at transfer locations wherever materials that can be recycled can be taken care of by the ragpickers.
2) Large scale awareness on the 3R's I.e Reduce, Reuse and Recyle should be spread so as to help in reducing the waste produced.
3) Low or Cheap tools for public awareness: one. Mass-education activities such as: • articles in newspapers. • news releases. • speeches. • public service announcements. 2. Guest lectures at: • colleges. • universities. • clubs. • guest appearances of municipal employees in radio programs. • interest teams / NGOs. • public events.

V. RESULT

The lack of cooperation from residents and industrial institutions has prevented the civic body's conceive to deliver the goods 100% supply segregation. Even after giving chances, many people still pass on mixed garbage.

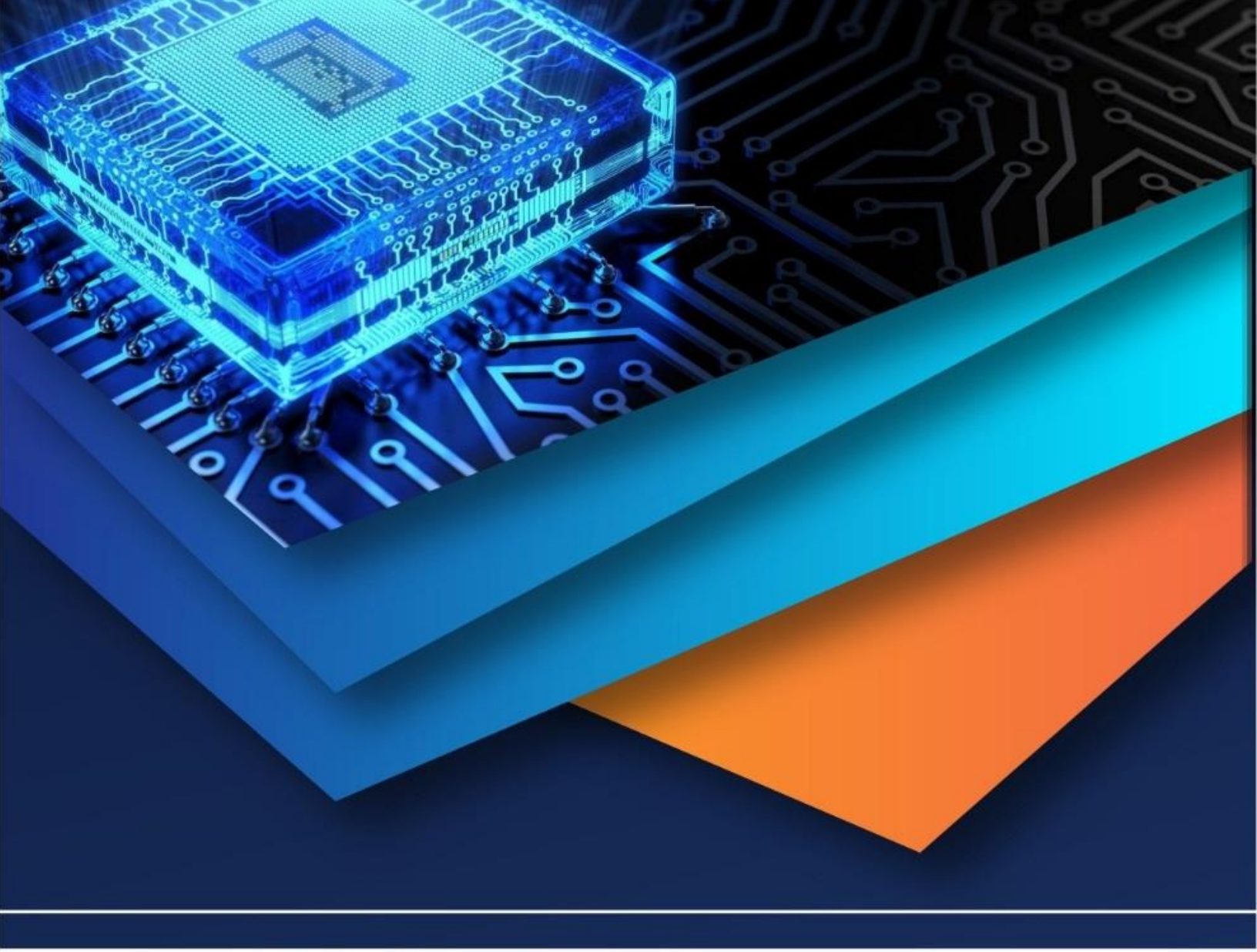
VI. CONCLUSION

It is discovered From December fifteen to thirty one of the year 2021, the town generated over 21,100MT garbage. Out of this, around 12,700MT mixed garbage has been transported and droped at Bhandewadi. This means, around 55% people are still handing over the mixed garbage to non-public agencies engaged in door-to-door trash collection. The NMC has not been able to accomplish the goal of stopping waste merchandising in Bhandewadi. Atomic number 47 surroundings has collected 10,459,41MT garbage from Laxmi Nagar, Dharampeth, Hanuman Nagar, Dhantoli andstatesman Nagar zones. Rather than lifting solely divided garbage, it transported largely 6,067. 09MT mixed garbage.

BVG India, that provides services in Gandhibagh, Satranjipura, Lakadganj, Ashi Nagar and Mangalwari zones, collected 6,635.16MT mixed garbage out of totalten,689.02MT. Of the 1,567 trips, it created 978 journeys with mixed garbage that is discarded at Bhandewadi.

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