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Municipal Solid Waste Management: An Integral Role Played by Mysuru City Corporation

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Abstract: This work is the outcome of field work in Mysuru City Corporation. Solid waste management is a vast concept, which deals with the process of collecting, treating and disposing of waste material generated by humans at large. Improper management of generated waste creates environmental pollution. The concept has various dimensions to deal with proper management of collected waste such as municipal solid waste, electronic waste, industrial waste, domestic waste, construction and demolition waste (C & D). This article focuses mainly on municipal solid waste management, commonly used as garbage – which consists of day to day items that humans use and throw away. The term is mainly concentrated on four components such as source of waste generation, sorting, and waste treatment and disposal facilities. In ancient times, the cities like Athens and Greece practiced throwing of wastes onto streets and roadways. In some cities like ancient Rome, property owners were held responsible for cleaning the streets of their respective properties. Later on, the process of the collecting and disposal of waste was started in some cities like Boston, New York, Philadelphia. The practice of landfills was introduced instead of open dumping in the 20th century. Here, environmental governance is an inevitable factor for the study. The administrative role of urban local bodies (ULBs) of the country can be seen as responsible for the municipal solid waste management. It is very crucial to deal with the maintenance of generated waste. So, we noticed the existence of local self-bodies all over the world to deal with municipal solid waste management. In that way, this article deals with the Mysuru City Corporation's role in municipal solid waste management. Mysuru, is one of the cleanest cities in Karnataka, and well planned city vastly developed by the Kingdom of Wodeyars of Mysore. The city's Municipal Corporation has adopted advanced scientific waste disposal methods across the city to enhance the healthy standard of living. With a population of nearly 12 lakh, the city generates about 450 tonnes of waste daily, which is managed through a scientific approach in collaboration with the Mysuru City Corporation and public-private partnerships. The city has introduced a new concept to proper management of municipal solid waste, which is known as zero waste management located in nine zones with one centralized solid waste management plant to have proper disposal of collected waste from households. Mysuru city has adopted scientific methods to dispose of household waste. Plastic waste disposal plant has gained much popularity and is a unique feature in a centralized solid waste management plant which is located in Vidyananyapuram of Mysuru city.

Keywords: Environmental Pollution; Kingdom of Wodeyars of Mysore; Landfills; Mysuru City Corporation; Solid Waste Management;

Introduction

The Management of Municipal solid waste has been a continuous effort to maintain a clean and healthy environment. Nowadays this becomes a severe problem and a direct threat to both the environment and human beings. The municipal solid waste management is controlled by Urban Local Bodies (ULBs) of the country. The population is directly responsible for the generation of solid waste. Even though only 31% of Indian population resides in urban areas, this population of 377 million (Census of India, 2011) generates a gigantic 1,43,449 metric tonnes per day of municipal solid waste, as per the Central Pollution Control Board (CPCB), 2014-15 and these figures increase every day with an increase in population. To further add to the problem, the total number of towns (statutory and census) in the country have also increased from 5,161 in 2001 to 7,936 in 2011, thus increasing the number of municipal waste generation by 2,775 within a decade¹.

The development of planned Mysuru City started in the middle of the 19th century. By that time, earlier Mysuru City was further developed by Wodeyars of Mysore. Then, for the purpose of creation of local administrative activities a separate Municipal Committee was started in 1862. The effort was purely supported by Krishnaraja Wodeyar III. Fortunately, the city got the idea of sanitary division in 1885. During the British period, based on the establishment of 'The City Improvement Trust Board', the Mysuru city got India's first urban planning body in the year 1903. Meanwhile, the street lights facilities were provided to the city in 1908 and UGD (underground) system was introduced in 1910 respectively. A comprehensive drainage scheme was prepared and executed by Sir. M. Vishweshwaraiyah, the then chief engineer of Mysuru City. Later on, the status of City Corporation to Mysuru City was started from 10th June 1977. But the first election to Mysuru City Corporation started in 1983. Thus, the first Mayor was P. Vishwanath.

There are many important programmes conducted by Mysuru City Corporation to create healthy awareness among people of the city, one is, 'National level capacity-building workshop on Swacch Bharat Abhiyan was held by City Corporation on 26th May 2016. To understand the cleanliness initiatives in Mysuru, a workshop on the topic entitled, 'segregation of waste at all levels'. In this workshop, participants from over 24 cities from across the country were taken for field visits to Yadavagiri to give them exposure on how door-to-door waste collection is in process. Later, they were taken to the Zero Waste Management Unit, compost plant for better understanding on processing and disposal of waste. Another one is, the same Corporation launched a drive to create awareness among economically weaker sections about the importance of segregation of waste at their end on 2nd March 2014. The Corporation also started to distribute two sets of bins to each household starting with the backward areas asking the people to separate the waste accordingly. Hence, the city corporation has engaged in some quality programmes to access the people in solid waste management.

The Health Section of the Mysuru City Corporation plays a central role in the effective management of municipal solid waste in Mysuru City. The organizational framework of the Health Section is depicted in the chart below.

Chart 1: shows the structure of Health section in Mysuru City Corporation



Source: Prepared by Author

¹ <https://mohua.gov.in/upload/uploadfiles/files/Part2.pdf>

Based on information obtained from officials of the Health Section of the Mysuru City Corporation, the city generates approximately 452 tonnes of solid waste each day, of which around 402 tonnes are collected and handled by the Municipal Corporation. Despite this, only about 50–60 per cent of the total municipal waste is effectively segregated and scientifically processed by the responsible authorities. Mysuru has been following a Public–Private Partnership (PPP) approach for solid waste management for nearly two decades. A significant feature of this approach is the city's early adoption of Zero Waste Management (ZWM) plants. Under the ZWM framework, household waste is systematically separated into wet and dry fractions. Wet waste is treated through composting and vermicomposting techniques, while dry waste is further classified into approximately 25–26 categories. These segregated dry materials are sold to private recycling units, ensuring that a substantial proportion of waste is either recycled or reused. The Zero Waste Management plants operate through collaborations with non-governmental organizations under the PPP model, with overall supervision provided by the Mysuru City Corporation².

Currently, there are seven Zero Waste Management (ZWM) plants across the city, located in Vidyaranyapuram, J.P. Nagar Graveyard, Kumbarkoppal, Jodi Tengina Mara Bannimantap (two plants), and Kesare (two plants). These plants are connected to zonal offices and collectively have a capacity to manage 5 tonnes of waste per day. In practice, some of the plants process only 1 to 1.5 tonnes daily. Each plant is responsible for managing the waste from 5 to 10 wards, with environmental engineers overseeing operations to ensure smooth functioning. This decentralized waste management system, supported by the PPP model, has been instrumental in maintaining Mysuru's status as a clean city.

Table 1: Status of Zero Waste Management plants in Mysuru City

Name of Zonal offices	Total No. of Wards included	Places of ZWM plants
Zone-01	07	Vidyaranyapuram
Zone-02	08	J.P.Nagar
Zone-03	08	Manasagangotri Campus
Zone-04	05	Gokulam
Zone-05	07	Kumbarkoppal
Zone-06	05	Jodi Tengina Mara, Bannimantap
Zone-07	06	Jodi Tengina Mara, Bannimantap
Zone-08	09	Kesare
Zone-09	10	Kesare

Source: Department of Environmental Zone Office, Mysuru

Table 2: List of Dry waste Items (Non-Bio-degradable) and their Price in ZWM plants in Mysuru City

SL. No	Name of Dry Wastes	Price in Rupees (per kg)
1	Dry Mix Waste (Paper, Plastic, Tissue paper)	2=00
2	Segregated dry mix waste (paper & board)	5=00
3	Pet bottles	20=00
4	Milk covers	10=00
5	Hard plastic	14=00
6	Old news paper	10=00
7	Old magazines	9=00

² <https://rjpn.org/ijcspub/papers/IJCSP22D1025.pdf>

8	Old notebooks & textbooks	8=00
9	Iron materials	18=00
10	Aluminium	40=00
11	Magnet	14=00
12	Tin aluminium	40=00
13	Beer bottles	2=00
14	Coconut peat	4=00
15	Rubber tire, tubes	3=00
16	Thermo coal	1=00
17	Bulbs	3=00
18	Oil cover	8=00
19	Foot wear	2=00
20	Tablet strips, tooth paste strips	3=00
21	Cooker waste	3=00
22	E-waste, wires	10=00
23	Plastic bags	3=00
24	Glass pieces	1=00
25	Mixed plastic pieces	18=00
26	Card board	8=00

Source: Department of Environmental Zone Office, Kumbarkoppal, Mysuru

The above table 2 is giving the information about a list of non-bio-degradable wastes and their prices. The daily collected wet wastes are completely recycled and dry wastes are sold to different private sectors for reuse. Hence it was called zero waste management. 60 per cent of wet waste is converted into organic manure by aerobic composting systems and the remaining 40 per cent of dry waste is further separated into 26 categories then sold to recycling units. This is the everyday process in all seven Zero Waste Management (ZWM) plants in Mysuru City.

The existing landfill facility of Mysuru, located at Vidyananyapuram, consists of two disposal cells. The first cell accommodates approximately 2.43 lakh metric tonnes of waste, while the second cell contains around 1.83 lakh metric tonnes, which is presently under processing. Altogether, nearly four lakh metric tonnes of solid waste have been scientifically managed by the Mysuru City Corporation at this site. The landfill functions as more than a conventional dumping area, as it follows engineered waste disposal practices. Each disposal cell is lined with six-millimetre-thick high-density polyethylene (HDPE) sheets to prevent leachate from seeping into the groundwater. In addition, leachate collection pipes are installed to channel the liquid waste out of the cells, and the deposited waste is subsequently covered with layers of soil.

At present, the biodegradable waste processing facility sends about 90 tonnes of waste per day (TPD) to the landfill site, although the plant has a maximum handling capacity of 120 TPD. The Mysuru City Corporation has intentionally restricted the intake to 90 TPD to ensure safe and efficient operations. Non-biodegradable waste is systematically layered with soil to reduce environmental hazards. Once the landfill reaches its designated height, it is planned to be converted into a landscaped garden, reflecting one of the key environmental objectives of the Corporation. Furthermore, air-vent pipes have been installed at the landfill site to release gases and prevent incidents such as spontaneous combustion, which have occurred in other metropolitan cities, including Bengaluru, due to poor landfill management.

Leachate generated at the site is collected in a separate tank, treated, and subsequently transferred to the Sewage Treatment Plant (STP) located at the sewage farm. After treatment, the leachate is conveyed to Dalavayi Lake on Nanjangud Main Road, where it is utilized for irrigation and gardening purposes.

In addition, the Plastic Waste Reuse Unit established at the sewage farm in Vidyananyapuram represents an innovative initiative of the Mysuru City Corporation. The unit is operated by Jagruth Tech Pvt. Ltd., a private firm authorized by both the Mysuru City Corporation and the Pollution Control Board. The organization specializes in converting plastic waste into value-added construction materials such as interlocking blocks, tiles, kerbstones, road dividers, and Eco-Pro sheets, which serve as alternatives to plywood. These recycled products are marketed at competitive prices and are environmentally sustainable, with an estimated reusable lifespan of up to ten years. The primary objective of this

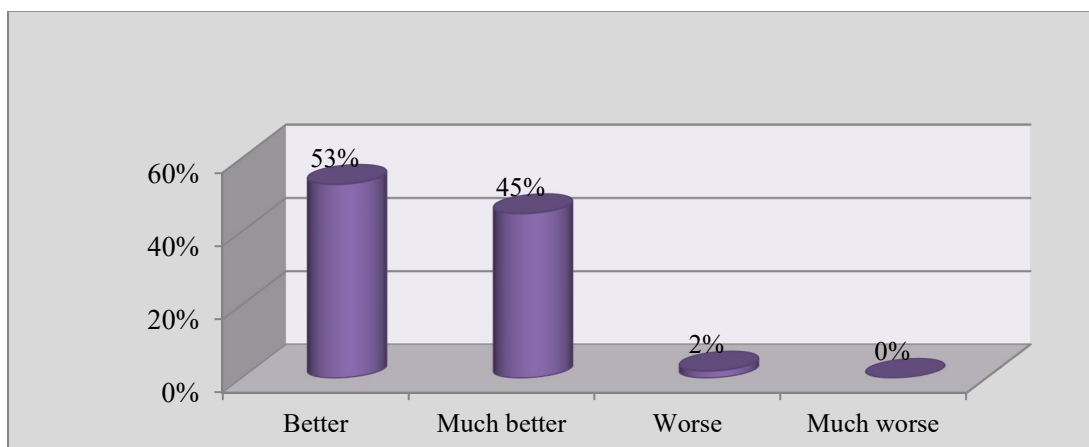
initiative is to reduce plastic-induced environmental pollution while promoting sustainable waste management practices³.

Table 3: Respondent public opinion about quality of the environment in Mysore City

Responses (in Numbers)		Percentage
1. Better	27	53%
2. Much better	23	45%
3. Worse	1	2%
4. Much worse	0	0%
Total	51	100%

Source: Primary Survey

Fig. 1 Respondent Opinion about Quality of Environment in Mysuru City



Source: Primary Survey

The above given Figure 1 is representing the percentage of respondents based on the quality of the environment in Mysuru City as compared to the environment 5 years ago. It is revealed that, 53% of people opined as 'better' quality of environment in Mysuru city as compared to the environment that they had 5 years ago; 45% of people opined as 'Much better' quality of environment in Mysuru city as compared with the environment that they had 5 years ago; 2% of people opined as 'Worse' about the quality of environment as compared with the quality of environment that they had 5 year ago; the option 'Much worse' is recorded nil. From the above obtained information, it is understood that the quality of environment in Mysuru city is improving as compared with the quality of environment before 5 years ago.

Conclusion

This study has undertaken to assess the real picture of Mysuru City Corporation's effective working conditions with regards to Municipal Solid Waste Management. Here, it is found that Mysuru City is the second highest populated city after Bengaluru City. Obviously, the households are more in number and household generated wastes are also high in quantity. This is the major issue that could be managed by City Corporations in India as well as in Karnataka too. Mysuru City generates 452 tonnes per day of waste daily and it is only 60-70% of total collected wastes are treated in the City. It is also found that both residents of the city and respective members of the city corporation are responsible for this issue in Mysuru City. Another one research finding of the present study is that, the effective handling of Municipal Solid Waste is managed by the Health Section of City Corporation. All officers of this section are more dedicated and they can take necessary measures to improve the condition of Solid Waste Management Plants in

³ <https://rjpn.org/ijcspub/papers/IJCSP22D1025.pdf>

Mysuru City. All plants are organized and managed by private ownership organizations. They are equipped with effective scientific techniques to dispose of the collected wastes.

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