SOLID WASTE MANAGEMENT AND INDIAN CITIES: A CASE OF JAIPUR MSWM

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ABSTRACT

Today many parts of the world are grappling with the issue dealing with their waste. Thousands of Millions of tonnes of waste is produced by the world every year. Unfortunately India, today, has become the biggest waste generator of the world. It is going to be a serious threat to our natural ecosystem if some urgent and strict measures are not taken immediately. Even as we are number two in terms of population after China, we have left our neighbor behind in terms of generating amount of waste.

This problem is a major point of concern for many cities in India be it the metropolitan cities, tier-II cities or the other small towns and cities. The challenge of managing the solid waste generated by the population in the urban areas is becoming bigger with every passing day. The city of Jaipur which is also known as the Pink City worldwide is also coping with this problem. Although there is a Jaipur Municipal Corporation Solid Waste Management Bye-Law, 2018 in place to deal with the issue of waste management in the city, however, the implementation of the law needs a lot of improvement to fulfill the objective of the law. This paper is an attempt to review the existing infrastructure of solid waste management in Jaipur, the capital city of Rajasthan province of India. The study is carried out through systematic literature review and analysis of the news reports in the media and documents of the Jaipur Municipal Corporation (JMC).

Keywords: Jaipur, solid waste management, JMC, cities, urban spaces, India, environment etc.

I. INTRODUCTION

Most of the Indian cities are experiencing fast-paced development in terms of infrastructure building, transportation etc. And a large scale migration is happening towards the cities which is a common phenomenon seen across the country. Jaipur is also experiencing these changes at a rapid speed. Presently the population of Jaipur is more than 3.5 million according to the census of 2011. With the increasing population in the urban spaces the amount of waste generation is also increasing manifold. The case is no different in Jaipur. The two major landfill sites of Jaipur are Langariyawas and Sewapura. The hundreds of tonnes of wastes being dumped at these landfill sites on a daily basis make the living condition of the dozens of villages near these sites extremely harsh. The pollutant materials coming out from the fires and smoke of the area are causing several difficulties to the nearby population. Last year, during the lockdown, Down to Earth had reported how the Sewapura landfill site kept burning for several weeks causing severe pollution in the nearby areas increasing the PM10 level in the atmosphere by four times leading to serious risks on human health for people living in the areas surrounding the site (Sharma, 2020).

Solid waste management is very significant aspect of urban spaces and their environmental management. However, like other cities of India solid waste management also seems to be a low priority area for the city administration. The work of SWM has never been taken that seriously either by public or by the concerned authorities and in present time the solid waste is impacting our heath, environment and well-being. Waste minimization is a popular technique all over the world these days which implemented for reducing the amount of waste generation, primarily through reduction at the source and it also includes recycling and reuse of waste materials produced at different levels. The benefits of minimizing of generation of waste are both for the environment as well as for the government and the society. To effectively carry out waste management, different points needs to be considered such as source reduction, onsite storage of waste, efficient collection and transfer, processing, and the disposal of the waste collected from several places. To define solid waste, one can say that it
is the production of unnecessary substances left after they become useless for the user who has used it. With the increase in various sectors exponentially, more initiatives needs to be developed.

To reduce the generation of the waste in the society, it is very important for the change in the approach we consume and utilize things in our lives. ‘Waste’ can be defined as something that is no longer considered useful and is, therefore, dumped by the person who possessed it. However, a change in approach to view waste as a resource rather than as of no use could be the first effective step needed to decrease the generation of the waste (Kumar, Somendra, & Jaluthriya, 2016). Waste can is commonly classified into four categories i.e. solid waste, biomedical waste, hazardous waste and electronic waste. Municipal solid waste (MSW) is referred to the useless stuff thrown out from households and the commercial sector which may include food leftover, yard abstract, and debris at the construction sites.

In Jaipur, the total waste generated on a daily basis is 1383 tonnes of which only 1008 tonnes of waste is collected by transportation vehicles of the city’s municipal corporation. This indicates that the efficiency of collection of waste of the city administration is only 73%. This way around 27 per cent of the waste remains on the streets and roads. The per capita solid waste generation per day is around 500 gm, which with a family size of almost five, results in around 2 kg/day. One hardly finds any data published on the composition of waste in Jaipur, although the figures of India in generally are reasonably accurate depiction for Jaipur as well. If one talks about the composition of the waste at national level, it would be 50% biodegradable, 25% inert waste 9% plastic, 8% paper, 4% scraps, and 1% glass.

And the composition of different kinds of wastes keeps changing time to time. During the summer season, there is more biodegradable waste generated because of the increased vegetation. The composition of plastic in waste has probably been decreasing due to the recent ban on plastic bags in Rajasthan from beginning August 2010. This paper deals with the topic of solid waste management as it is a prominent concern related to environmental sustainability. Since Jaipur is a rapidly developing city, effective waste management practices is especially needed. The objective of this research work is to understand the Jaipur’s SWM practices through a broad-based approach that include systematic literature review and document analysis of reports and other documents published by JMC and other as well as the news reports published or broadcasted by media.

**Landfill sites in Jaipur**

**Sewapura:** This waste disposal site is situated at a distance of around 20 km from the center of the city on Jaipur-Delhi bypass. The total area of the Sewapura site is around 200 bigha. As per the estimates around 250-300 tonnes of solid waste is dumped at this site every day in normal course.

**Mathuradaspura:** This landfill site is located in the eastern part of the city and covers an area of around 176 Bighas where the waste is dumped. It is the oldest garbage disposal space in the city located around 18 kilometers from the heart of the Jaipur city. According to estimates, around 300-400 tonnes of waste are disposed off at this site every day.

**Langariyawas:** This is another waste disposal site located near Mathuradaspura landfill site at a distance of around 4 kilometers. The area that this site covers for dumping the garbage of the city is around 480 bighas and therefore, is the biggest site for waste disposal of Jaipur city.

**Municipal Solid Waste Management (MSWM) in Jaipur**

The solid waste management system in the Jaipur city could be found in different layers. The vision behind the solid waste management system of the city as prepared by the Municipal Corporation of the city talks about the waste management to be carried out effectively through the public-private partnership (PPP) model. The solid waste management of the city to keep the city environment clean and healthy for its citizens could be located in two sectors – formal and informal. The formal sector include the male and female workers deployed by the JMC which include sweepers and the other sanitation workers both permanent and casual taking care of various kinds of sanitation (Upadhyay, Jethoo, & Poonia, 2012). Similarly, the informal sector comprise of rag-pickers and door-to-door waste collectors and recyclers who collect the waste materials from the households and sell them for money to other vendors. Local NGOs and private firms are also involved in the process as identified by the JMC and the Rajasthan government as the partners for implementing the process of SWM in the city. They are given responsibilities of various kinds at different levels of solid waste management deployed by the JMC.
The Jaipur Municipal Corporation also deploys vehicles for collection and transportation of the solid waste from various parts of the city to the different landfill sites mentioned above. There are different kinds of vehicles put to use for this purpose as a part of the solid waste management infrastructure developed by the JMC. The various technologies used for solid waste disposal that are used in various parts of the world and India today like composting, recycling, biomethanation, recycling, incineration, waste-to-wealth approach and waste-to-energy approach, refuse-derived fuel etc. are in place with the JMC in Jaipur city as well. However, as it could be gauged from the present state of affairs these technologies and approaches are not efficiently being made use of by the relevant authorities for deriving better and desired results in the area of solid waste management (Times of India, 2018).

**Major challenges in MSWM**

If one has to understand the major challenges that come in the way of effective solid waste management in the city of Jaipur, it could outlined through the following points:

- **Lack of awareness among the citizens**: one of the major challenges that affect the efficiency of the solid waste management in the city is the lack of awareness among the citizens about the processes of the waste management. On one hand, people do not care about the segregation of the waste at their household level which makes it extremely difficult for the works of the JMC to effectively dispose of the various kinds of waste generated by the people in different parts of the city.

- **Technological challenges**: despite availability of some of the newest technologies for the management of the solid waste at JMC, there is lack of skilled and qualified people to efficiently put to use those technologies to achieve the goal of solid waste management in the city. And therefore, the technological infrastructure put in place by the corporation goes in vein without resulting in any desired outcome.

- **Corruption**: another important hindrance in the process of effective solid waste management in the city is the widespread corruption at different levels as a result of which those not carrying out their duties and responsibilities appropriately are not taken to task by the right authorities and those failing to do so provide some or the other kinds of favours to the authorities and escape. Similarly, the corruption is prevalent also in the process of purchasing of new tools and technologies for the purpose that adversely affect the entire process of solid waste management in the city. The corruption is also there at the level of allocation of the funds for the purpose as the determined fund is misappropriated at different levels in the execution of the solid waste management process.

- **Funding**: the adequate allocation of fund for the effective disposal of the waste is another problem. Many a times the priorities for the government and the JMC seems to be in the wrong place as the disbursal of fund for solid waste management which requires huge amount of resources both human and otherwise need a lot of fund. But the crunch of fund even for smaller purposes like placing dustbins at all the places for people’s convenience in disposing of the garbage from their homes or market places becomes difficult due to dearth of fund allocation.

These challenges are pictorially represented below for better understanding of the different kinds of obstacles that are observed in the process of solid waste management in Jaipur.
Implementation of Solid Waste Management in the city

The solid waste management work is handled by the Jaipur Municipal Corporation which is headed by a politically appointed person through elections known as Mayor. In the administrative hierarchy, the chief executive officer (CEO) is at the top who heads the corporation’s administrative system. CEO is supported by the health commissioner, chief engineer and other administrative personnel from different departments for the effective implementation of the solid waste management system in the city. The city is divided into 77 wards which are further grouped into a total of eight zones. Each ward has sanitary inspector deployed by the JMC who further employs a supervisor and sweepers to carry out the waste collection and disposal work at the ground level.

As per the rules of the JMC, the job of the female sweepers is to sweep the streets and roads with their brooms, collecting them and piling them on the sides of the roads and streets within their designated areas in the wards. The numbers of streets and areas for cleaning by the sweepers are determined by the number of population.

Similarly the responsibilities of the male sweepers are to de-silt drains wherever necessary to ensure that the water flows properly without any blockage. They also lift up the waste collected by the women sweepers on the roads and streets and put them in the handcarts. Technology-wise earlier they would use wheelbarrow but these days they have been provided with cart that has six separate buckets and two compartments for the materials they gathered by de-silting the drains.

However the work of the door-to-door waste collection is given to the informal sector wherein people pay to some outside agencies and take their services for collection of waste from their households and their disposal. After the collection of the waste through the deployment of formal and non-formal sectors, the JMC transports

Pic. 1: Represent the challenges in the process of solid waste management of Jaipur.

Pic. 2: The people involved in waste collection and disposal at ward level in Jaipur city as deployed by JMC.
them for storage. The JMC trucks collect the waste from the storage sites and transport them to the 5-6 transfer stations that the city has. And from there, the waste is brought to one of the three dumping yards or the landfills which have been mentioned above i.e. Sewapura, Mathuradaspura and Langariyawas.

II. CONCLUSION

The solid waste management is an important area to be taken care of by the municipal corporations of the cities in India to ensure clean and healthy environment. However, most of the cities in India are not able to deal with the implementation of effective solid waste management systems due to several challenges. Even as there are systems, infrastructure and technologies in place for the purpose, their optimum use is not ensured by the relevant authorities as a result of which the SWM is not proving to be that successful in many cities.

The case of Jaipur is no different from other parts of the country. Even as the new technologies and infrastructure are there in place, the JMC is not able leverage them efficiently manage its solid waste generated in the city on a daily basis. However, with new endeavours like coming up with PPP model to deal with the issue and with the involvement of the informal sector, one could see that the process is improving and in the days to come the efficiency could be seen to be improving at the level of JMC with the development of more professional approach by the corporation.

REFERENCES: