

Analysis Of Solid Waste Management (SWM) Situation In 10 Urban Cities Of India And Raising Public Awareness Among Households

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Abstract

Global Solid Waste Management has become a severe challenge as a result of modern lifestyles that place a high priority on consumption and disposal. Pressure on our planet's land space exacerbates the issue. Wet and dry materials make up the diverse types of urban solid waste. Waste results in a significant waste of resources, including materials and energy. In fact, the amount of garbage generated might be seen as a measure of society's materialism. The aim of the study is to assess public awareness of solid waste management (SWM) of 10 urban cities of India. For the purpose of gathering the data for this descriptive study, a variety of methods were used. A descriptive and experimental design involves the process of collecting, assessing, and "combining" either qualitative and quantitative information and approaches in a continuous study to understand a research methodology. Delhi and Kolkata generated less waste per household than all the other cities combined. Overall, 55% of homes produce around 1 kilogramme of garbage, and 34% produce about 1/2 kg. Only 11% of families, or a small percentage, did not know how much garbage their houses produce. Segregation of waste is the most important part of Municipal SWM and also this research; this was discussed in detail with the households.

Keywords: Solid waste management, segregation of waste, waste generated, urban cities.

Introduction

India has a tremendous need to fill in the area of waste management (SWM). There are no effective Municipal Solid

Garbage (MSW) removal mechanisms to handle the growing volume of waste. Neither urban and rural areas struggle with solid waste management and elimination. Not simply for developing economies, but also for rich ones, it is a major issue (Annepu, 2012).

The subject of exactly how to properly and better manage waste wastes in order to safeguard our environment and ensure humankind's continuance is one of the utmost importance (Rathi and Kumar, 2014). Every individual has the ability to produce garbage, making them a part of the issue Hirokawa et al., 2021).

Business sectors, including home, professional, industrial, and some others, generate pollutants, although only the governmental or administration authority are in charge of managing it. Therefore, the issue of Proper Waste Management is still being worked on by authorities, cities, and towns (Singh, 2020). There has been a general realisation worldwide that within order to address these issues, which has negative impacts on both the human health and the environment (Gupta et al., 2015). The main objective of the study is to analyse public awareness of solid waste management (SWM) of 10 urban cities of India.

Material and method

The current state of SWM, as well as public knowledge of SWM, are described in this paper. For the purpose of gathering the data for this descriptive study, a variety of methods were used. Based on the technique, the researcher simultaneously gathered quantitative and qualitative data, individually examined each data set, then combined the two databases during interpretation.

Data collection

The present study was based on both primary and secondary data. Fieldwork was undertaken over six month's period in 2022-23.

Collection of Primary Data

Relevant research data may be gathered using a variety of techniques, including telegraph personality questionnaires, surveys, etc. The current study's data gathering primarily focused on personal interviews and observations.

Secondary Data

With regard toward the 10 states, quantitative information gathered from numerous sources was collated, and please note was carried out.

Result and Discussion

Public awareness of Solid waste management (SWM)

In all the 10 cities, all the interviewed residents / households were aware of the type of waste generated in their homes. They also gave a detailed description of the different categories of waste generated. Mix type of waste is generated.

**Table 1: Approximate Quantity of Waste Generated Per Home
N = 1000**

Sr. No.	City	1 kg (%)	1/2kg (%)	No Idea
1	Delhi	5	95	0
2	Chandigarh	39	61	0
3	Kolkata	0	90	10
4	Mumbai	27	32	31
5	Pune	24	63	13
6	Panaji	100	0	0
7	Chennai	35	40	25
8	Hyderabad	40	60	0
9	Bhopal	16	61	23
10	Surat	50	48	2

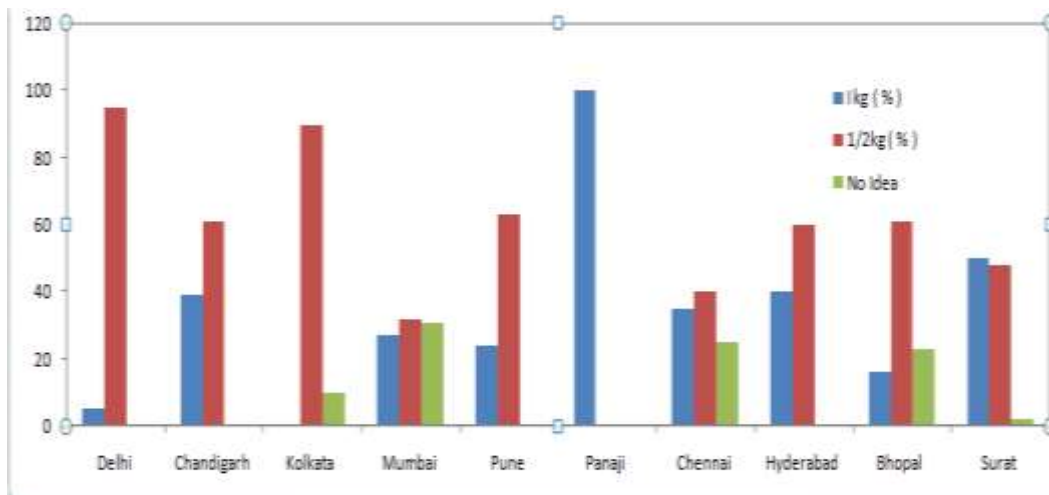


Figure 1: Waste Generated

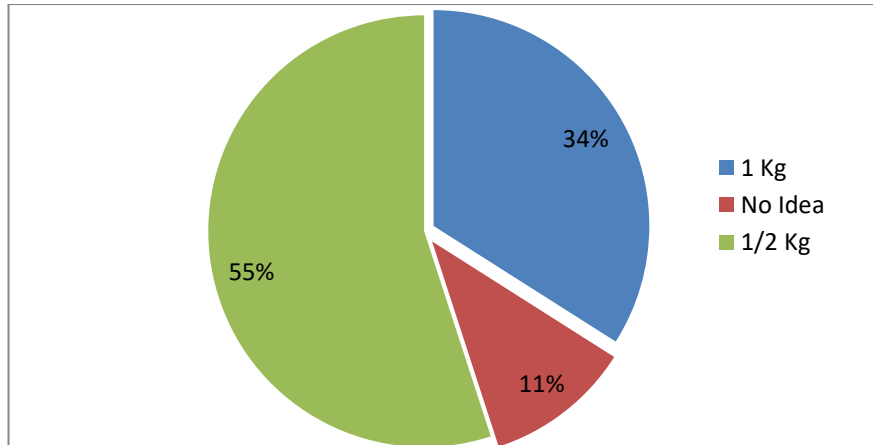


Chart 1: Waste Generated

As seen from the above table every household was approximately aware of the quantity of waste generated in their homes. From the above table it is seen that Maximum waste 1 Kg per household is generated in Panaji, and this is the reason why the per capita waste generation (kg/day) is 0.616 maximum as compared to all cities in spite of the population being only 114,405.

Delhi, Kolkata generated less waste per household as compared to all other cities. In all total 55 % households generate approximately 1kg waste, around 34 % generate ½ kg waste. Only a fraction of households i.e. 11% did not have any idea as to how much waste is generated in their homes.

Segregation of waste is the most important part of Municipal SWM and also this research; this was discussed in detail with the households.

Table 2: (A) Comparison Of Segregation Of Waste In The 10 Cities

Sr. No.	City	Segregation (%)	No Segregation (%)
1	Delhi	22	78
2	Chandigarh	14	86
3	Kolkata	11	89
4	Mumbai	25	75
5	Pune	52	48
6	Panaji	85	15
7	Chennai	43	57
8	Hyderabad	43	57
9	Bhopal	24	76
10	Surat	60	40

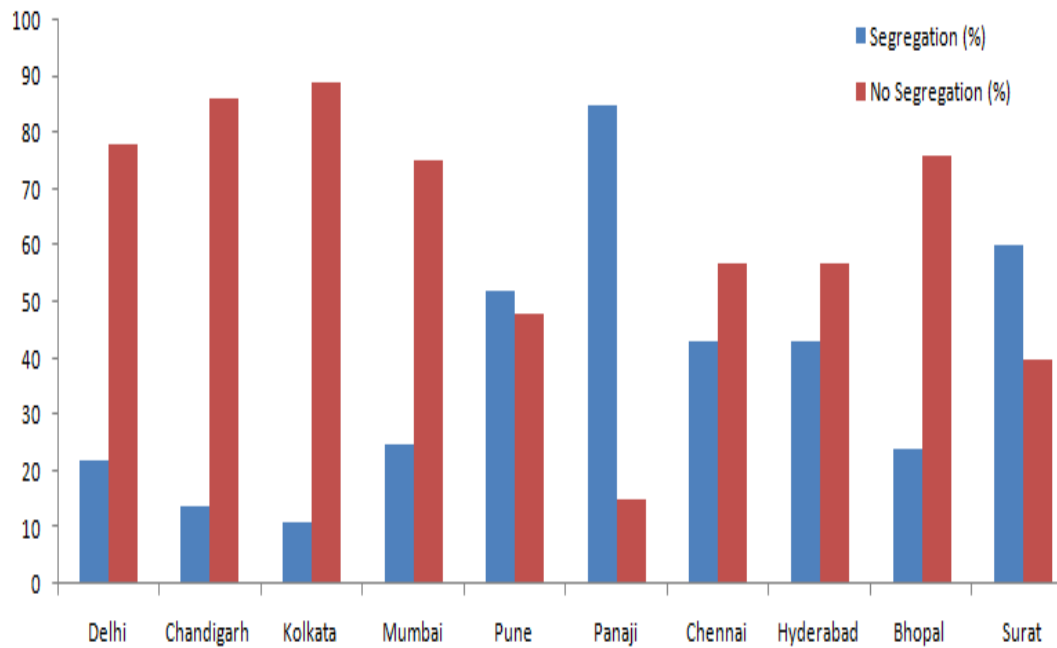


Figure 2: Segregation of waste

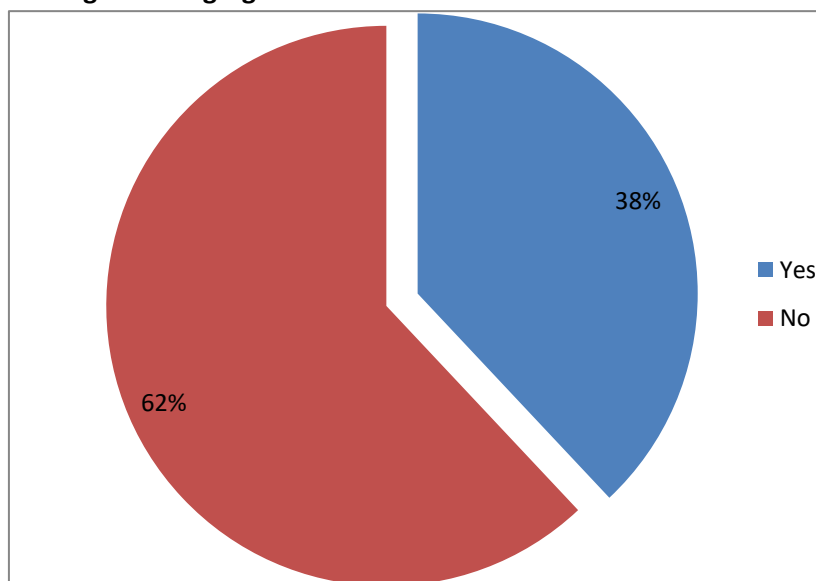


Chart 2: Segregation of Waste

Northern cities the segregation is less compared to the other parts of India. Average segregation level is 37.9%

As seen from the above table every household surveyed, felt that there is a need for segregation of waste but they are not doing it.

Except the residents of Mumbai all other cities, 97.9 % residents agreed that by not segregating they are not doing the right thing. In Mumbai city only 79 % agreed, 7 % said that it is absolutely fine if they do not segregate the waste and 14 % had

no idea about the segregation. This shows that the awareness is there about segregation, but people are not ready to follow it practically. There is a need for motivation and active participation.

While segregation the special technique that is followed is separating the waste based on wet waste that is biodegradable and dry waste or the waste that is non- biodegradable (Singh, 2020). Maximum segregation is seen in Surat, Pune, Chennai and Hyderabad in urban areas Minimum in Kolkata. In the urban slums segregation is done only in Panaji and a bit in Hyderabad. Rest none of the slum areas do segregation of waste. As shown in the following graphs.

As stated above the average segregation level is just 37.9%. This is the main area of concern.

Table 3: Awareness of Residents / Households About The Dry Waste Collection Done By The Municipality In Their City

Sr. No.	City	Aware of the dry waste collection	Unaware of the dry waste collection
1	Delhi	0	100
2	Chandigarh	0	100
3	Kolkata	0	100
4	Mumbai	11	89
5	Pune	41	59
6	Panaji	0	100
7	Chennai	0	100
8	Hyderabad	0	100
9	Bhopal	0	100
10	Surat	0	100

It is a surprising fact that only 5.2 % Residents / Households are aware about the dry waste collection done by the municipalities. This awareness is seen only among the Residents / Households of Mumbai and Pune. In these two cities also it is restricted to the urban areas only. 94.8% are ignorant. Majority of the Residents / Households were surprised to know that the municipality is doing something like this.

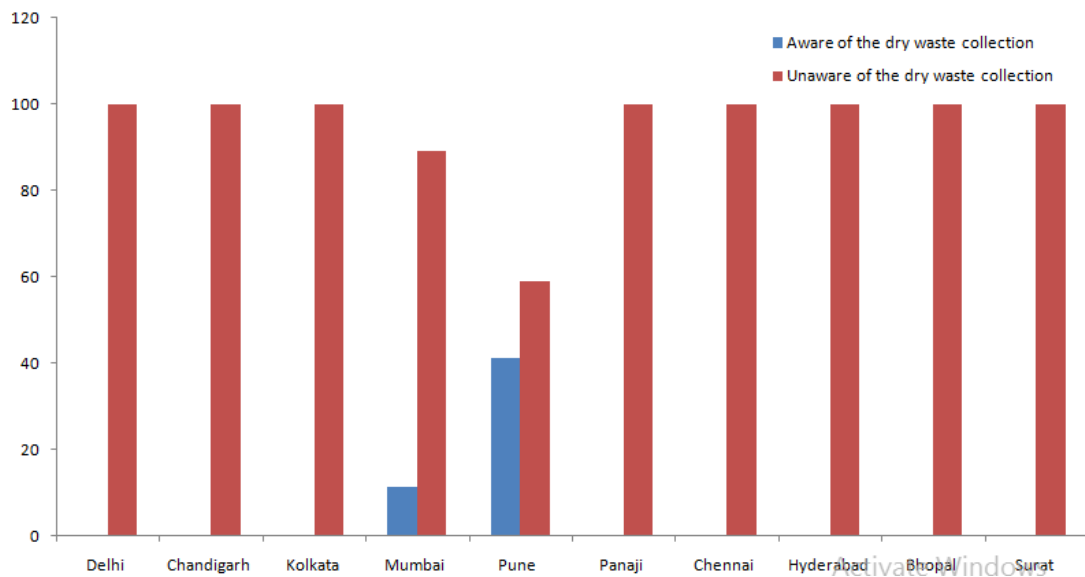


Figure 3: Awareness of residents about the dry waste collection

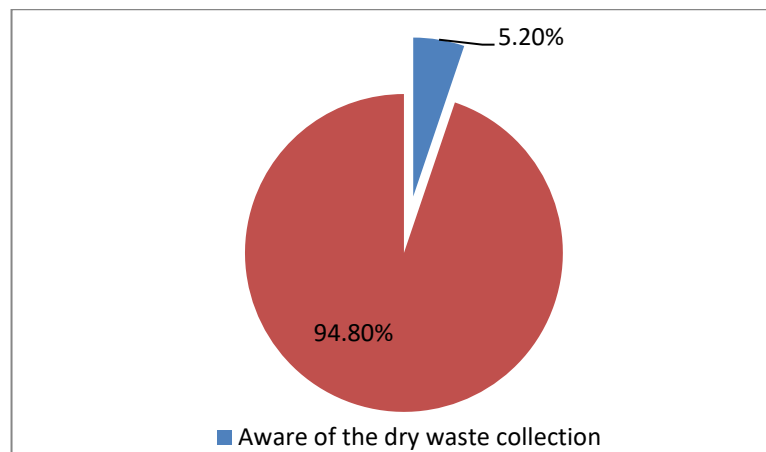


Chart 3: Awareness of residents about the dry waste collection

The reason for the unawareness stated by majority of the Urban Households is that, the garbage collectors, collects our waste so we are unaware what they do with the collected waste. While the Urban slum Households said, we throw our garbage in the bin or the overflowing drain (Somani et al., 2021). The lanes inside are so narrow and congested that no municipality van can enter. Thus we are not aware of this fact.

Conclusion

Knowing about the importance and benefits of sorting trash and knowing what kinds of trash can be recycled are two sides of the same coin. People do know that it is good to separate Solid Waste so that it is not all dumped together. The goal is to

make it easier to manage solid waste by recycling some of the waste.

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