

## **Bird's eye view of populace perspective towards a more sustainable solid waste management.**

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### **Abstract**

Reason for selecting the topic: - Solid waste is frequently considered pointless, inappropriate, and disposed of waste created after our everyday exercises. Each everyday action should will in general create squander that could be recyclable. The development in commercialization and way of life has heaped on extra weight on the age of solid waste. This investigation needs to examine the public view of reasonable solid waste administration it presents an appraisal of the quickly rising volume of metropolitan solid waste, its evolving structure, then proceeding with the training of blending biodegradable (wet) waste with dry waste at the wellspring of age, and the developing volume of plastic in the waste. The current framework is centered on the assortment and transportation of generally blended unsegregated waste.

Research gap: -The current state of affairs has seen a drastically changed perspective towards the importance of hygiene and better environmental sustainability. The importance of cleanliness and waste management was never highlighted more than in the current situation and no such study was carried out from the populace perspective in the aforementioned location hence the researcher would like to inspect and study the same.

Methodology: -The examination likewise intends to check the public's view of work done by the community body and the qualities and synthesis of these squander and the natural issues related to its administration are additionally researched. Organized surveys were utilized to acquire essential information from an irregular size of the populace.

Implications and results: -The study gives an overall view of respondents about the current state of affairs of solid waste management. Study also highlighted the fact that many societal members are willing to contribute and change about their way they dispose of waste. Many respondents felt that they can act along with the civic authority to create awareness which in turn can lead to a better scenario..

**Key words:** Solid waste management, environmental perspective, health sustainability

### **Introduction**

“Refuse what you do not need; reduce what you do need; reuse what you consume; recycle what you cannot refuse, reduce, or reuse; and rot (compost) the rest.” – Bea Johnson

Solid waste is characterized as pointless, inappropriate, or cast-off material that is produced because of the day-by-day exercises. Indians are burning through more than ever and more utilization implies more wastage. Rising industrialism, evolving way of life, and urbanization have prompted expanding volumes of waste. The progressions have likewise brought about changes in the manner solid waste has been produced. The cutting-edge metropolitan solid waste separated from normal age-old vegetable and family squanders has now fundamentally developed with plastics, paper, metal, and glass. Since the current age of waste is additionally not dealt with adequately, it intensifies the issue. Preferably, the foundation and conveyance components for solid waste administration, seepage, sewerage, and wastewater treatment ought to be arranged and carried out in a planned structure of a city improvement plan. Other than focusing on improving the prompt natural and general wellbeing emergencies coming about because of the current extremely helpless condition of solid waste administration, there is a requirement for an unmistakably expressed medium-term methodology to address the difficulties of solid waste administration in Indian urban communities.

A viable methodology for overseeing waste needs to begin with the isolation of solid waste at the wellspring of age and the treatment of various parts of the waste improperly in various ways, in this manner lessening the lingering waste that may some way or another go to landfills. While the standards of solid waste administration are by and large better comprehended and more talked about in the public area, no Indian city has accomplished an all-encompassing answer for the difficulties of solid waste administration. The consideration concerning city authorities to the assortment of isolated waste and its transportation, treatment/handling, reusing, and safe removal is as yet in an incipient stage. Customer personal conduct standards in Indian urban areas have additionally not adjusted to work with the interaction of the board of this loss by isolating natural or biodegradable waste from other waste at the wellspring of age. It has been noticed that solid waste administration is a worldwide issue and that it is a developing wellspring of worry in created and agricultural nations because of the increment in urbanization, changes in buyer example, and industrialization which all straightforwardly means an increment in solid waste age. Legitimate Solid Waste Administration Plan gives a total way and sets a way to accomplish new waste minimization, redirection, and removal targets (Roy, 2013).

Solid Waste Administration Rules (2016) give a sensible system to address the various difficulties of civil solid waste administration in India.<sup>2</sup> They are a huge improvement over the Metropolitan Solid Waste Administration Rules (2000), which was the first run through such guidelines were at any point informed for Indian cities.<sup>3</sup> Key bearing and subsidizing by the Public authority of India through public missions, for example, JNNURM, AMRUT, Savvy Urban areas, and Swachh Bharat Mission have likewise established a climate in which there is all the more however in no way, shape, or form sufficient spotlight on the issue. It is critical to deciphering the vision from the Standards and the Missions into an operational coordinated procedure of solid waste administration.

Up to this point, the greater part of the city waste was gathered from the local area dustbins or waste was amassed in close by spots of society by the metropolitan governments. House to house assortment endorsed by the Civil Solid Waste Principles (2000) was either done through Inhabitant Government assistance Affiliations utilizing private waste gatherers or NGOs or not under any condition. With Solid Waste Administration Rules (2016) setting more noteworthy accentuation on the house to house an assortment of waste isolated at the wellspring of age and Swachh Bharat Mission giving assets to the framework, numerous urban areas are detailing expanded inclusion of house to house assortment, albeit the assortment is generally not of isolated waste and the assortment inclusion likewise will, in general, be exaggerated.

The sudden grim situation arising out of the COVID outbreak took the world by the scruff of its neck. The world was not prepared for the outbreak of such a pandemic. The pandemic made everyone sit up to be stationed and notice the changing hygiene perspective around them. Even in such a dire situation garbage collectors were at the forefront full filling their duties and highlighting the very fact that hygiene in every aspect was important and was worth striving for. The study intends to find out the perspective of respondents towards solid waste management and its impact on environmental sustainability.

## **Review of Literature**

Meka, Srinivasrao (2014) in his study highlighted the fact that in major cities municipal solid waste (MSW) has gained more significance since the turn of the decade. The study also opined through the current norms for the Metropolitan Solid Waste Administration Rules (2000), where stringent they still lacked application and required good planning to ensure the same. The study also highlighted the fact that growing consumerism and a growing appetite for the consumption of available products have been the chief cause of urban solid waste being generated.

Patel, Utkarsh & Ahluwalia, Isher (2018) in their study titled Solid Waste Management in India

An Assessment of Resource Recovery and Environmental Impact opined that two overpowering difficulties confronting metropolitan nearby governments in placing a powerful strong waste administration framework set up are (i) ecological maintainability and (ii) monetary supportability. Which are the chief drivers of Solid waste management decisions. The study also highlighted in detail about waste generation prevention, in the main case,

can overshadow the advantages got from some other waste administration practice; still, it normally gets negligible consideration or potentially exertion. Customer mindfulness programs spurring 'Reduce, Reuse and Reuse' conduct ought to be emphasized and components, for example, broadened maker obligation ought to be pushed.

Nwofe, Patrick (2015) in his studies highlighted the very fact that most of the times the residents tend to blame only the government and local administration for all the lack of facilities or growth in solid waste but a sustainable system needs healthy cooperation and coordination between local authorities and citizens to develop a more solid foundation and a more sustainable program for handling such situation. The study also stated that a better solid waste management system should continuously be evaluated and should always be technically sound to stay relevant.

A study under Solid Waste Management Strategy & Improvement of Existing Scenario Based on Market Waste by Mondol, Ebna, Hasan Md, Md. Syed rehamn (2013) proposed a management process for better and sustainable solid waste management process. The study basically focused on generation of solid waste at market place and hence offered the solution for the same

The primary goals of sustainable waste management are to protect human health and the environment and to conserve resources. Additional goals include prevention of the export of waste-related problems into the future (e.g. 'clean' cycles and landfills requiring little aftercare (Brunner, 2013)) and socially acceptable waste management practices (Wilson et al., 2007). A key pre-condition is affordable waste management costs research effective planning of solid waste management techniques

The waste quantities are estimated to increase from 46 million tonnes in 2001 to 65 million tonnes in 2010 (Kumar and Gaikwad, 2004). Most urban areas in the country are suffering from a lack of solid waste management (SWM) problems, even though large sums of municipal expenditure are earmarked for it.

European countries had applied various system assessment tools and engineering models to create sustainable communities, manage resources efficiently, tapping innovation potential of the economy, ensuring prosperity, environmental protection, and social cohesion in their SWM system (Pires et al., 2011)

The management of waste becomes complex and the facilities provided cannot cope with the increasing demand and needs. Therefore, the best approach needs to be implemented immediately while considering environmental, social, and economic aspects (Aye & Widjaya, 2006). The drivers of sustainable waste management were clarified by Agamuthu et al. (2009), which include the human, economic, institutional, and environmental aspect.

## **Research Methodology**

The researcher tried to understand the respondent's perspective via questionnaire. The questionnaire was designed in consultation with fellow researchers to ensure its relevance and reliability. The questionnaire was administered across variable geographical locations in the city to gather a broader and wholesome perspective of the respondent. A total of 200 respondents were taken as sample size.

## **Objectives**

- The study aims to study the societal perspective towards solid waste management
- The study aims to find out peoples perspective and there awareness about sustainable solid waste management
- To find out actual status of solid waste management in and nearby areas of respondent

## **Hypothesis**

H<sub>01</sub> - There is no significant difference between awareness level of genders and efforts towards solid waste management

H<sub>11</sub> - There is a significant difference between awareness level of genders and efforts towards solid waste management

H<sub>02</sub>–All the factors do not play an equally important role in creating awareness and need to take action for sustainable solid waste management

H<sub>12</sub> – All the factors play an equally important role in creating awareness and need to take action for sustainable solid waste management

### Reliability

Scale: ALL VARIABLES

#### Case Processing Summary

|       |                       | N   | %     |
|-------|-----------------------|-----|-------|
| Cases | Valid                 | 200 | 100.0 |
|       | Excluded <sup>a</sup> | 0   | .0    |
|       | Total                 | 200 | 100.0 |

a. Listwise deletion based on all variables in the procedure.

#### Reliability Statistics

| Cronbach's Alpha | N of Items |
|------------------|------------|
| .893             | 21         |

High Cronbach's Alpha value signifies that scale is reliable and can be used for research purpose.

#### ANOVA

|  | Sum of Squares   | df              | Mean Square   | F     | Sig. |
|--|--|-----------------|---------------|-------|------|
| I am willing to take the effort to divide solid waste for better disposal  | Between Groups<br>10.800<br>Within Groups<br>178.995<br>Total<br>189.795 | 3<br>196<br>199 | 3.600<br>.913 | 3.942 | .029 |
| Improper Solid waste management can be degrading for environment and family health                                   | Between Groups<br>12.912<br>Within Groups<br>171.843<br>Total<br>184.755 | 3<br>196<br>199 | 4.304<br>.877 | 4.909 | .023 |
| I feel there is a need of better solid waste disposal plan   | Between Groups<br>4.070<br>Within Groups<br>170.525<br>Total<br>174.595  | 3<br>196<br>199 | 1.357<br>.870 | 1.559 | .021 |
| I feel authorities and communities need to undertake joint awareness initiative for sustainable solid waste disposal | Between Groups<br>10.296<br>Within Groups<br>175.704<br>Total<br>186.000 | 3<br>196<br>199 | 3.432<br>.896 | 3.829 | .011 |

|   |                |         |     |       |        |      |
|---|----------------|---------|-----|-------|--------|------|
| I feel burning the solid waste only adds to environmental problem                       | Between Groups | 6.929   | 3   | 2.310 | 2.604  | .043 |
|   | Within Groups  | 173.826 | 196 | .887  |        |      |
|   | Total          | 180.755 | 199 |       |        |      |
| I feel current situation demands even more caution and better solid waste disposal plan | Between Groups | 5.750   | 3   | 1.917 | 2.352  | .044 |
|   | Within Groups  | 159.750 | 196 | .815  |        |      |
|   | Total          | 165.500 | 199 |       |        |      |
| I feel may health issues can be managed if solid waste is managed properly              | Between Groups | .837    | 3   | .279  | .603   | .048 |
|   | Within Groups  | 90.683  | 196 | .463  |        |      |
|   | Total          | 91.520  | 199 |       |        |      |
| I am willing to use recyclable goods as my part of reducing waste                       | Between Groups | 23.624  | 3   | 7.875 | 10.141 | .030 |
|   | Within Groups  | 152.196 | 196 | .777  |        |      |
|   | Total          | 175.820 | 199 |       |        |      |
| I feel a better solid waste management is a part of environment conservation            | Between Groups | 13.272  | 3   | 4.424 | 5.533  | .041 |
|   | Within Groups  | 156.708 | 196 | .800  |        |      |
|   | Total          | 169.980 | 199 |       |        |      |

The Hypothesis was tested against nine considered parameters. After using SPSS and ANOVA method the results were calculated for all the parameters differently.

The calculated values 0.029, 0.021, 0.023, 0.011, 0.043, 0.044, 0.048, 0.030, and 0.041 are less than 0.05 hence Null Hypothesis is rejected at 5% level of significance and alternate hypothesis H11 - There is a significant difference between awareness level of genders and efforts towards solid waste management is accepted as per the calculated value given above.

This simply helps us to deduce that the awareness level of genders is a significant factor and helps in increasing the efforts towards a more sustainable solid waste management.

### Factor Analysis

#### Communalities

|  | Initial | Extraction |
|--|---------|------------|
| I am willing to take the effort to divide solid waste for better disposal  | 1.000   | .709       |
| Improper Solid waste management can be degrading for environment and family health                                   | 1.000   | .616       |
| I feel there is a need of better solid waste disposal plan   | 1.000   | .723       |
| I feel authorities and communities need to undertake joint awareness initiative for sustainable solid waste disposal | 1.000   | .516       |
| I feel burning the solid waste only adds to environmental problem  | 1.000   | .844       |
| I feel current situation demands even more caution and better solid waste disposal plan                              | 1.000   | .427       |
| I feel may health issues can be managed if solid waste is managed properly   | 1.000   | .681       |

|   |       |      |
|---|-------|------|
| I am willing to use recyclable goods as my part of reducing waste   | 1.000 | .534 |
| I feel a better solid waste management is a part of environment conservation  | 1.000 | .395 |
| I feel that media has raised my awareness about solid waste management  | 1.000 | .908 |
| I feel separating different type of waste at your home is a key to better solid waste management                                | 1.000 | .914 |
| I feel it is the joint responsibility of community and government to ensure a more sustainable system of solid waste management | 1.000 | .625 |

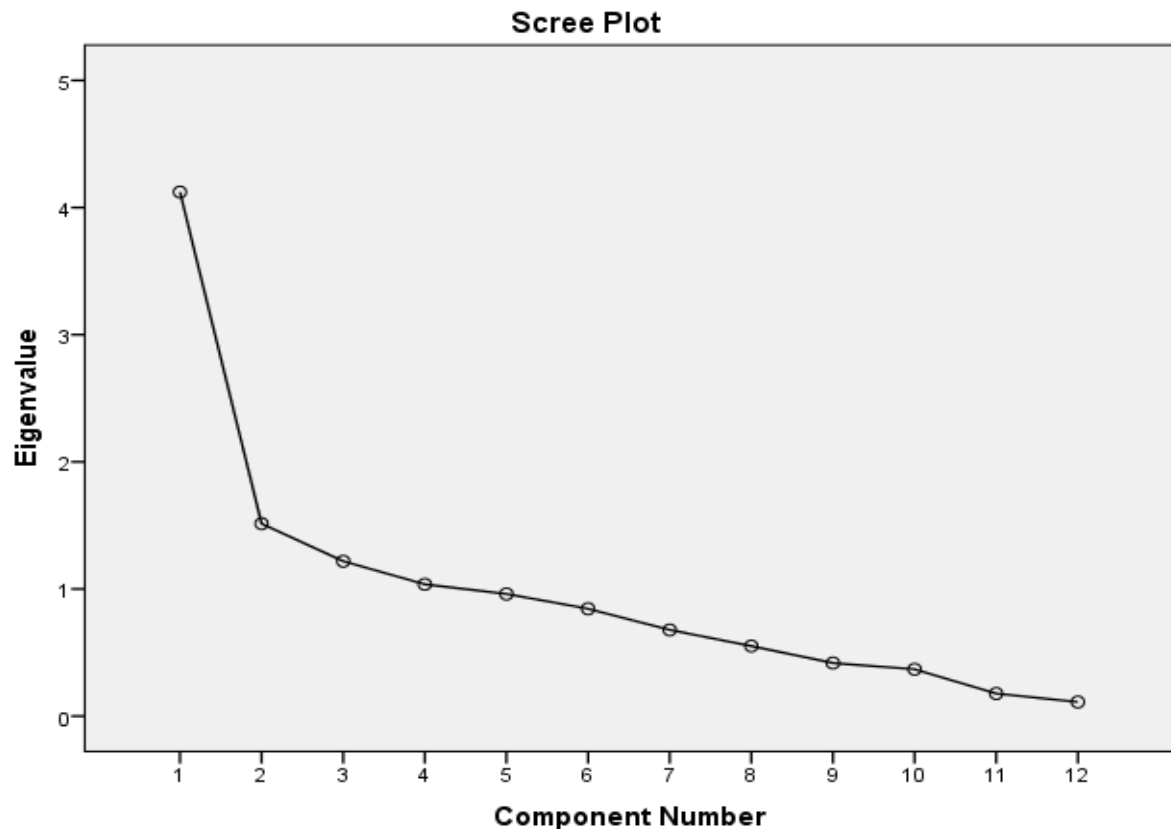
Extraction Method: Principal Component Analysis.

#### **Total Variance Explained**

| Component | Initial Eigenvalues |               |              | Extraction Sums of Squared Loadings |               |              |
|-----------|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|
|           | Total               | % of Variance | Cumulative % | Total                               | % of Variance | Cumulative % |
| 1         | 4.122               | 34.349        | 34.349       | 4.122                               | 34.349        | 34.349       |
| 2         | 1.514               | 12.613        | 46.962       | 1.514                               | 12.613        | 46.962       |
| 3         | 1.218               | 10.152        | 57.114       | 1.218                               | 10.152        | 57.114       |
| 4         | 1.037               | 8.640         | 65.754       | 1.037                               | 8.640         | 65.754       |
| 5         | .961                | 8.005         | 73.759       |                                     |               |              |
| 6         | .844                | 7.037         | 80.796       |                                     |               |              |
| 7         | .678                | 5.651         | 86.447       |                                     |               |              |
| 8         | .551                | 4.591         | 91.038       |                                     |               |              |
| 9         | .418                | 3.481         | 94.518       |                                     |               |              |
| 10        | .369                | 3.074         | 97.592       |                                     |               |              |
| 11        | .178                | 1.481         | 99.073       |                                     |               |              |
| 12        | .111                | .927          | 100.000      |                                     |               |              |

Extraction Method: Principal Component Analysis.

Table marked Total Variance Explained records the eigenvalues related with each factor before extraction, after extraction, and after the revolution. Before extraction, it has distinguished 12 straight segments inside the informational index. The eigenvalues related to each factor address the difference clarified by that specific direct part and the table likewise shows the eigenvalue regarding the level of change clarified (factor 1 clarifies 65.754% of all-out fluctuation). It ought to be certain that the initial not many variables clarify moderately a lot of difference (particularly factor 1) though resulting factors clarify just limited quantity of change. The table concentrates all variables with eigenvalues more prominent than 1, which leaves us with four components, where 70 % of the total difference is shown. In the last piece of the table, the eigenvalues of the elements after pivot are shown. Turn upgrades the factor construction and one ramification for this information is that the overall significance of the four components is even out.



The scree plot above which is like a thunderbolt indicating the point of inflection on the curve. The curve seems to be difficult to interpret because the curve begins to tail off rapidly after fourth factor after which it begins to get stabilized hence the researcher justifiably retains four factors hence researchers' feels that all factors considered do not carry equal importance.

**Component Matrix<sup>a</sup>**

|  | Component |       |       |       |
|--|-----------|-------|-------|-------|
|  | 1         | 2     | 3     | 4     |
| I am willing to take the effort to divide solid waste for better disposal  | .783      | -.013 | -.259 | .168  |
| Improper Solid waste management can be degrading for environment and family health                                   | .730      | -.109 | -.265 | -.027 |
| I feel there is a need of better solid waste disposal plan   | .798      | -.147 | -.250 | .035  |
| I feel authorities and communities need to undertake joint awareness initiative for sustainable solid waste disposal | .652      | .145  | -.261 | .041  |
| I feel burning the solid waste only adds to environmental problem  | .897      | -.127 | -.152 | .031  |
| I feel current situation demands even more caution and better solid waste disposal plan                              | -.010     | -.384 | .054  | -.526 |
| I feel may health issues can be managed if solid waste is managed properly   | -.098     | -.048 | .209  | .791  |
| I am willing to use recyclable goods as my part of reducing waste  | .131      | .664  | .164  | -.221 |

|   |      |       |       |       |
|---|------|-------|-------|-------|
| I feel a better solid waste management is a part of environment conservation  | .208 | .550  | .172  | .140  |
| I feel that media has raised my awareness about solid waste management  | .677 | -.144 | .647  | -.103 |
| I feel separating different type of waste at your home is a key to better solid waste management                                | .700 | -.146 | .635  | -.008 |
| I feel it is the joint responsibility of community and government to ensure a more sustainable system of solid waste management | .303 | .713  | -.053 | -.151 |

Extraction Method: Principal Component Analysis.

a. 4 components extracted.

From the above calculations and factor reduction analysis method the researcher determined that not all factors carried equal importance and only four factors acted as more determinant or dominated the curve of decision making factors hence researcher opines that null hypothesis  $H_{02}$  – All the factors do not play an equally important role in creating awareness and need to take action for sustainable solid waste management is accepted.

### Findings and conclusion

After doing research and analyzing all the relevant information obtained through the analysis of questionnaire the researcher felt that though some respondents felt that government and civic bodies are doing enough to fulfill their duties of disposal of solid waste majority of the respondents felt that there was a lot left to be desired and can be improved upon. Majority of the respondents felt that solid waste disposal is now a key concern as lack of basic amenities and improper waste collection and its disposal is a grave concern for health of family members and better steps need to be taken in order to make it more sustainable. The government ought to present an intense reusing strategy and guarantee that the law is stringently clung to by all. This will decrease the volume of squanders in the waste dump locales, make it simpler for the waste materials to be input in the creation chain, and diminish the expense of creation of the materials required because of diminished crude materials need. The examination further uncovered that the organization liable for the clearing of this waste doesn't do that consistently. It was additionally seen that the current garbage removal circumstance is required to deteriorate because of quick urbanization in the state, expansion in impromptu settlements and lodging, and absence of feasible waste administration advancements is again viewed as a gigantic issue. The researcher also found out that many respondents opined that they are willing to do their part if there is a need of better societal coordination and they believe that it will have a positive impact for the environment. The respondents also opined that health and hygiene are the important most parameters for a nation to grow sustainable environment development for which solid waste management acts as a key foundation.

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