

## **A Study on Community Participation and its Impact on Recycling Behaviour in the ‘Trash-To-Treasure Challenge’ Under the Swachh India and Green India Mission**

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### **Abstract**

This study examines the role of community participation in promoting recycling behaviour through the *Trash-to-Treasure Challenge* under the Swachh India and Green India initiatives. Using primary data collected from 151 respondents, the study analyzes the relationship between awareness, availability of recycling facilities, and participation in recycling activities. The findings reveal that awareness and access to waste management infrastructure significantly influence participation, while gender does not show a significant impact. The study highlights the importance of awareness campaigns and improved waste management facilities to strengthen community engagement in sustainable environmental practices.

**Keywords:** Community Participation, Recycling Behaviour, Waste Management, Trash-to-Treasure Challenge, Environmental Awareness, Sustainable Practices

### **Introduction**

Rapid urbanization, population growth, and changing consumption patterns have significantly increased waste generation in Indian cities, creating challenges for public health, sanitation, and environmental sustainability. To address these issues, the Government of India launched the Swachh Bharat Mission in 2014 to improve waste management systems, promote cleanliness, and encourage citizen participation. Alongside this, the Green India Mission focuses on ecological balance and sustainable environmental practices.

An emerging initiative supporting these missions is the “Trash-to-Treasure” concept, which encourages recycling, reuse, and upcycling of waste into useful products. This approach treats waste as a valuable resource rather than a burden, helping reduce landfill pressure while promoting innovation and environmental awareness. The effectiveness of such initiatives largely depends on active community participation, including households, schools, and local organizations. Understanding factors such as awareness, motivation, and access to recycling facilities is therefore essential for improving program outcomes. This study examines the role of community participation in the Trash-to-Treasure Challenge and its impact on recycling behaviour, aiming to provide insights that support the broader vision of a cleaner and greener India.

### **Need Of Study**

Increasing urban population, evolving consumption patterns, and rising municipal solid waste have intensified the demand for effective and sustainable waste management practices in India. Government initiatives such as the Swachh Bharat Mission and the Green India Mission emphasize environmental sustainability and cleanliness, but their successful implementation largely depends on active community participation. Despite growing awareness about waste management practices, a noticeable gap still exists between knowledge and actual involvement in waste segregation and recycling activities. Factors such as inadequate infrastructure, limited institutional support, and demographic differences often lead to inconsistent participation levels. The Trash-to-Treasure Challenge encourages recycling and creative reuse of waste materials, yet the determinants influencing participation in such initiatives remain insufficiently explored. Hence, this study analyzes the factors affecting community participation to support more effective and sustainable waste management strategies.

**Problem Statement**

- Despite several government initiatives promoting sustainable waste management, community participation in waste segregation and recycling remains inconsistent across different regions in India.
- Existing studies indicate that awareness programs alone are insufficient to ensure long-term behavioural change in waste management practices.
- Factors such as infrastructure availability, social norms, institutional support, and demographic differences significantly influence participation levels.
- Low segregation rates, irregular waste collection, and limited community coordination continue to hinder the effective implementation of waste management initiatives.
- Therefore, this study examines whether factors like awareness levels, gender differences, and access to waste management facilities significantly influence participation in the Trash-to-Treasure Challenge.

**Objectives**

1. To examine the relationship between awareness of the Trash-to-Treasure Challenge and participation in recycling activities.
2. To determine whether the availability of waste management and recycling facilities influences community participation in recycling initiatives.
3. To analyse whether demographic factors such as gender and age affect participation in environmental initiatives.
4. To evaluate the role of community awareness and environmental concern in motivating individuals to practice waste segregation and recycling.
5. To assess the willingness of community members to participate in future Trash-to-Treasure activities.

**Literature Review**

**Anjinappa and Lokesh (2025)**

Examine how community involvement in solid waste management under the Swachh Bharat Mission (Gramin) is affected by Panchayat-led education initiatives. reveal a strong a positive correlation, showing that villages with regular awareness campaigns have higher cleanliness drive participation. The study does point out that without institutional follow-up and behavioral incentives, awareness is not sufficient. The authors come to the conclusion that in order to ensure sustainable rural waste management, Panchayat governance must institutionalize structured and participatory awareness campaigns.

**Bansal et al. (2025)**

Examine the ways that community involvement, environmental consciousness, and waste management competence affect how effective solid waste management is considered. show that while environmental concern has a comparatively lesser impact, waste management knowledge and positive attitudes significantly boost perceived efficacy. The study shows that substantial community involvement and local and citizen government collaboration result in better trash management outcomes. It comes to an understanding that education is insufficient on its own unless it is supported by collective community action and behavioral change for sustainable waste management.

**Sangeetha and Manasi (2025)**

Evaluate the effects of behavioral and demographic factors on residential solid waste management practices in Bengaluru's HSR Layout. The findings demonstrate how environmental awareness, education, and supportive government actions significantly promote appropriate waste management practices. Although almost all families adhere to fundamental trash segregation, there are still gaps in the handling of hazardous, electronic, and sanitary waste. The paper suggests more community involvement, better garbage infrastructure, and specific courses to ensure sustainable urban solid waste management.

Examine how well volunteer-based sharing of data could improve trash from home segregation techniques in an urban Indian setting. Waste segregation and ecologically conscious behaviour are encouraged locally by trained community volunteers. The findings focus on tracking changes in trash segregation levels and decreases in incorrectly sorted waste over time. The study comes to the conclusion that in order to achieve sustainable waste management practices, community-driven motivation and ongoing involvement are more successful than regular top-down awareness campaigns.

**Kalyanasundaram et al. (2025)**

Using a participative photovoice-based crowdsourcing method, examine how the public views waste segregation. The study finds important incentives, challenges, and behavioral patterns impacting waste management methods through looking at images and narratives submitted in a national competition. Participants showed an understanding of the importance of the reduce, reuse, and recycle principles; nevertheless, low community involvement and participation were seen to be important issues. In order to understand how attitudes, norms, and abilities interact, the results are analyzed using the Theory of Planned Behavior and the motivation- opportunity- behavior framework. The study comes to the conclusion that creating inclusive and sustainable solutions for waste management requires community-driven, participatory methods.

**Halder and Singh (2014)**

Using the Theory of Planned Behavior (TPB), examine the recycling intentions of New Delhi schoolchildren. Subjective norms (social influence) are the most significant predictor, followed by attitude and perceived behavioral control. The results show that societal expectations and peer pressure have a big impact on young Indians' recycling habits. The study comes to the conclusion that in order to encourage involvement in waste management practices, policymakers and schools must make recycling a social norm and provide sufficient facilities.

**Jayasree (2024)**

It emphasizes community involvement and service effectiveness while examining solid waste management issues in Kerala's Mattannur Municipality. The study emphasizes how public indifference and the "Not in My Backyard" (NIMBY) mentality restrict efficient trash management techniques, even in the face of high literacy rates. Although community-led programs like Kudumbashree units and Haritha Karma Sena make an important contribution, irregular collecting and poor infrastructure lower overall effectiveness. Although locals are willing to pay more for better systems, survey results suggest gaps in environmental awareness and discontent with irregular waste collection services. The study comes to the conclusion that attaining sustainable solid waste management requires boosting infrastructure, making sure waste is collected on a regular basis, and encouraging participatory governance.

**Mukherji and Sekiyama (2016)**

Examine Delhi's household waste management habits, knowledge, and desire to take part in solid waste management. Although abstract knowledge is favorably correlated with willingness to participate in trash management, the majority of citizens lack fundamental information of biodegradable and non-biodegradable garbage. The results show gender and socioeconomic differences, with women, older people, and higher and lower socioeconomic groups indicating proportionally more knowledge. The study comes to the conclusion that encouraging decentralized solutions for waste management and raising consciousness may significantly boost citizen compliance and engagement.

**Research Gap**

Existing literature highlights the importance of community awareness and infrastructure in promoting waste management practices; however, limited empirical studies specifically examine the role of structured initiatives such as the Trash-to-Treasure Challenge in influencing recycling behaviour. Additionally, there is a lack of statistical analysis exploring how factors like awareness levels, gender differences, and access to waste management facilities affect community participation in such programs.

### **Research Design**

For this study, an exploratory and descriptive research method was used. The study is descriptive in nature because it seeks to characterize and quantify the degree of community awareness, recycling activity engagement, and waste management infrastructure availability under the Swachh India, Green India Mission's Trash-to-Treasure Challenge initiative.

The study is also exploratory because it looks to see how variables like participation in recycling activities, gender, availability of waste management facilities, and awareness of the effort relate to each other. A systematic questionnaire was used to gather primary data for the study, which evaluated community members' awareness, recycling habits, and involvement in environmental initiatives.

### **Research Type**

#### **I. Descriptive**

#### **II. Exploratory**

### **Source of Data**

#### **Primary Data**

Individuals in the community were given an online survey to answer so as to gather primary data for the study. Those who reside in the area and may be directly or indirectly active in recycling, waste segregation, or environmental projects are among the first participants.

Responses on demographics, knowledge of the Trash-to-Treasure Challenge, participation in recycling activities, and the presence of waste management facilities in their area were gathered using a structured questionnaire. The responses aid to assess the degree of awareness, involvement, and difficulties community members face while engaging with recycling programs.

### **Data Collection Period**

The time range in which the research responses were gathered is known as the data collecting period. The survey responses for the study, "A Study on the Role of Community Participation in the Trash-to-Treasure Challenge under the Swachh India, Green India Mission," had been collected over the course of four days, from March 7 to March 10. In order to collect primary data during this period, the questionnaire was sent to respondents via online methods. Regarding recycling procedures, trash segregation techniques, and awareness of the Trash-to-Treasure project, the respondents were asked to express their thoughts and experiences. This time frame gave respondents enough time to finish the survey and produced accurate data for a further investigation of awareness of the environment and community involvement.

**Sample Size:** A total of **151 respondents** participated in the survey and provided responses for the study.

### **Target Audience:**

The study's target population includes community members that are at least eighteen years old. Students, working professionals, mothers who remain at home and other community members are among the responses. These people were chosen because they directly contribute to the creation of household waste and can offer helpful insights about recycling procedures, waste segregation practices, and knowledge of environmental programs such as the Trash-to-Treasure Challenge.

### **Data Collection Tool**

In this study, the structured questionnaire served as the main instrument for gathering data. The questionnaire was split into several sections that covered demographic data, knowledge of the Trash-to-Treasure Challenge, participation in recycling activities, access to waste management facilities, and views of the community toward environmental programs. The majority of the questions were multiple-choice and closed-ended, allowing respondents choose the response that most accurately reflected their beliefs or actions. It was easier to arrange the

responses and do statistical analysis thanks to this structure. The data gathered will be utilized to look into connections between variables and to understand the elements affecting community involvement in environmental and recycling initiatives.

#### Data Collection:

Impact of Waste Segregation and Community Participation Initiatives in Mumbai)

| Indicator                       | Before Initiative (Early Phase)         | After Initiative / Improvement                                             |
|---------------------------------|-----------------------------------------|----------------------------------------------------------------------------|
| Waste segregation at source     | Around 15% households segregating waste | Increased to ~82% segregation in many wards                                |
| Daily municipal waste generated | ~6,500 tonnes per day                   | ~6,300–6,500 tonnes (stable but better managed)                            |
| Scientific waste processing     | Around 32% processed                    | Increased to about 35% processing                                          |
| Dry waste collection centres    | Limited facilities                      | Around 41+ dry waste segregation centres established                       |
| Community groups involved       | Limited participation                   | 719 Advanced Locality Management (ALM) groups involved in waste management |
| Waste collection system         | Mixed waste collection                  | Separate wet and dry waste collection across 24 wards                      |

The comparison indicates that waste-segregation initiatives and community participation programs in Mumbai have improved recycling practices and increased the number of households segregating waste. However, the overall growth in scientific waste processing remains relatively slow, and a significant portion of waste is still not effectively recycled. This suggests that despite improvements, greater public awareness, behavioural change, and stronger community engagement are still required to achieve more efficient and sustainable waste management outcomes.

#### Data Analysis and Interpretation

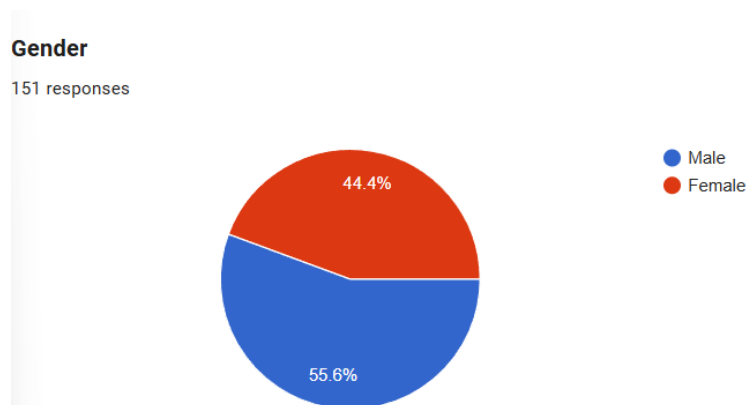


Fig 7.1

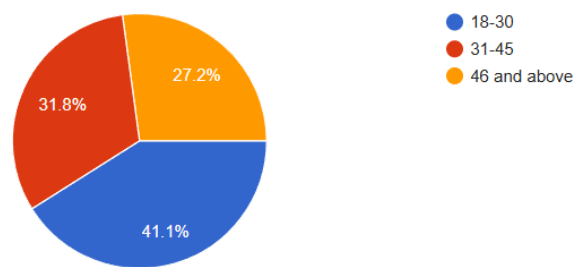
| Sr No. | What is your gender | Number of Respondents | Percentage of Respondents |
|--------|---------------------|-----------------------|---------------------------|
| 1      | Male                | 84                    | 55.6%                     |
| 2      | Female              | 67                    | 44.4%                     |
|        | <b>Total</b>        | <b>151</b>            | <b>100%</b>               |

**Interpretation:**

The above chart illustrates the distribution of respondents who took part in the study by gender. The males make up 55.6% of the sample, or the majority of the 151 respondents. Of the total responses gathered through the study, 44.4% are from female respondents. This suggests that both genders are still roughly distributed in the sample, despite the slight majority of male respondents. Due to this representation, the study is able to perform meaningful gender-based analysis regarding involvement in recycling and environmental initiatives under the Trash-to-Treasure Challenge.

**Age Group**

151 responses

**Fig 7.2**

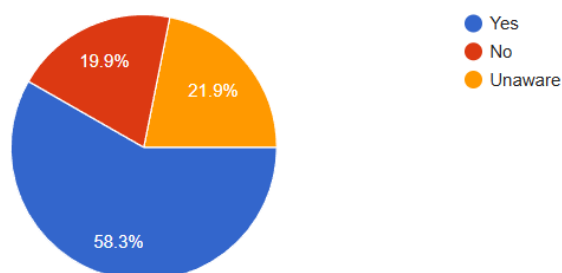
| Sr No. | What is your age group? | Number of Respondents | Percentage of Respondents |
|--------|-------------------------|-----------------------|---------------------------|
| 1      | 18–30 years             | 62                    | 41.1%                     |
| 2      | 31–45 years             | 48                    | 31.8%                     |
| 3      | 46 years and above      | 41                    | 27.2%                     |
|        | <b>Total</b>            | <b>151</b>            | <b>100%</b>               |

**Interpretation:**

The above chart illustrates the age distribution of study participants. The majority of the 151 respondents, or 41.1% of the sample, are between the ages of 18 and 30. 31.8% of respondents were between the ages of 31 and 45, and 27.2% are over the age of 46. This suggests that young adults make up the majority of survey respondents. Diverse age representation is guaranteed by the presence of respondents from middle-aged and older demographics, helping in understanding community involvement in recycling and trash management initiatives across various age groups.

**Have you heard about the Trash-to-Treasure Challenge?**

151 responses

**Fig 7.3**

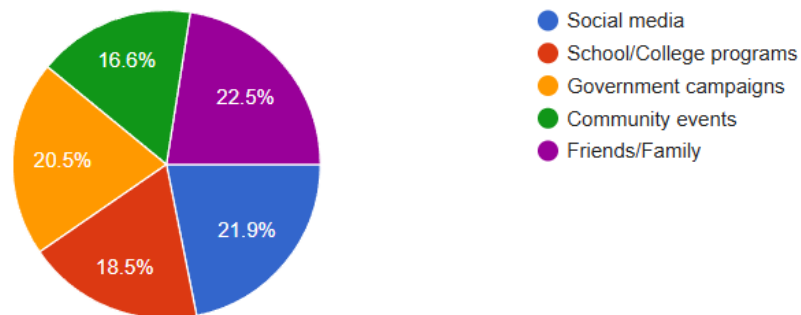
| Sr No. | Have you heard about the Trash-to-Treasure Challenge? | Number Respondents | Percentage Respondents |
|--------|-------------------------------------------------------|--------------------|------------------------|
| 1      | Yes                                                   | 88                 | 58.3%                  |
| 2      | No                                                    | 30                 | 19.9%                  |
| 3      | Unaware                                               | 33                 | 21.9%                  |
|        | <b>Total</b>                                          | <b>151</b>         | <b>100%</b>            |

**Interpretation:**

The above chart illustrates the respondents' awareness of the Trash-to-Treasure Challenge. A relatively high degree of community awareness is indicated by the fact that 58.3% of the 151 respondents said they had heard of the initiative. However, 19.9% of respondents said they had not heard of the challenge, and 21.9% said they were ignorant of it. This implies that an important portion of the community is still unaware of the project, despite the fact that over half of the participants are aware of it. The findings demonstrate that in order to guarantee greater involvement in recycling and waste management programs under the Trash-to-Treasure Challenge, stronger awareness campaigns and initiatives for community engagement are required.

**How did you learn about the initiative?**

151 responses

**Fig 7.4**

| Sr No. | How did you learn about the initiative? | Number Respondents | Percentage Respondents |
|--------|-----------------------------------------|--------------------|------------------------|
| 1      | Social media                            | 33                 | 21.9%                  |
| 2      | School/College programs                 | 28                 | 18.5%                  |
| 3      | Government campaigns                    | 31                 | 20.5%                  |
| 4      | Community events                        | 25                 | 16.6%                  |
| 5      | Friends/Family                          | 34                 | 22.5%                  |
|        | <b>Total</b>                            | <b>151</b>         | <b>100%</b>            |

**Interpretation:**

The above chart illustrates the Respondents acquired about the Trash-to-Treasure project from a variety of sources. The majority of the 151 participants 22.5% reported that that learned about the project from friends and family, highlighting the significance of personal networks in raising awareness. This is followed by 21.9% who discovered it via social media, highlighting the increasing impact of digital platforms in spreading knowledge about the environment. 18.5% of respondents learned of it through school or college programs, compared to 20.5% who heard about it through government initiatives. In addition, 16.6% of people discovered the advertising effort

through local gatherings. These results imply that participation in environmental projects like the Trash-to-Treasure Challenge is significantly affected by both official awareness campaigns and casual social encounters.

### Do you know that waste materials can be reused or converted into useful products?

151 responses

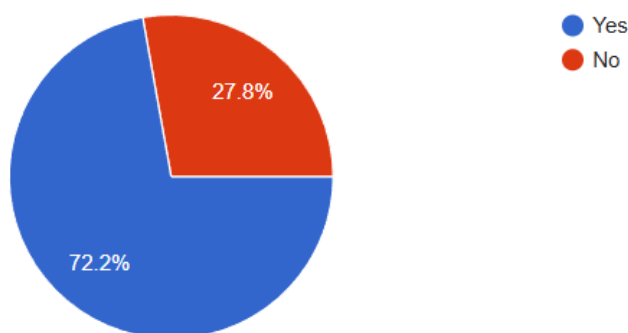


Fig 7.5

| Sr No. | Do you know that waste materials can be reused or converted into useful products? | Number of Respondents | Percentage of Respondents |
|--------|-----------------------------------------------------------------------------------|-----------------------|---------------------------|
| 1      | Yes                                                                               | 109                   | 72.2%                     |
| 2      | No                                                                                | 42                    | 27.8%                     |
|        | <b>Total</b>                                                                      | <b>151</b>            | <b>100%</b>               |

#### Interpretation:

The above chart illustrates the level of awareness among respondents regarding the reuse of waste materials. 72.2% of the 151 respondents said they were aware that waste materials may be recycled or turned into useful products. On the other hand, 27.8% of respondents said they were aware of this idea. This indicates that even while the majority of respondents had a basic knowledge of recycling and garbage reuse, a sizable section of the community is still ignorant. As an important objective of programs like the Trash-to-Treasure Challenge, the results highlight the significance of educational programs and awareness campaigns to further raise knowledge about recycling and the conversion of waste into valuable resources.

### How would you rate your awareness about recycling and waste reuse?

151 responses

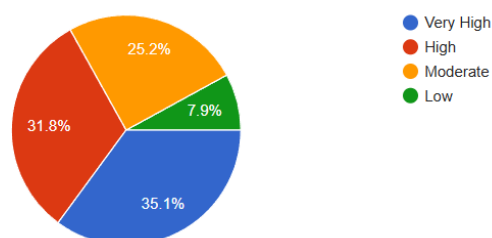


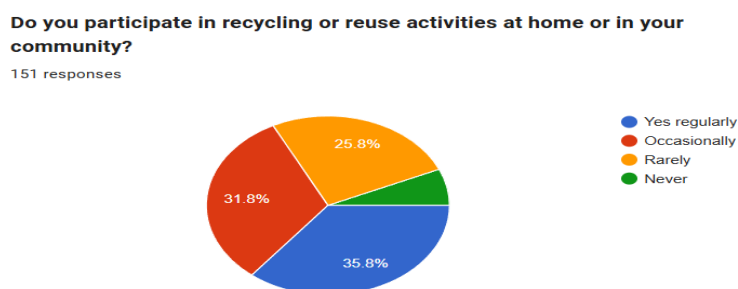
Fig 7.6

| Sr No. | How would you rate your awareness about recycling and waste reuse? | Number of Respondents | Percentage of Respondents |
|--------|--------------------------------------------------------------------|-----------------------|---------------------------|
| 1      | Very High                                                          | 53                    | 35.1%                     |

|   |              |            |             |
|---|--------------|------------|-------------|
| 2 | High         | 48         | 31.8%       |
| 3 | Moderate     | 38         | 25.2%       |
| 4 | Low          | 12         | 7.9%        |
|   | <b>Total</b> | <b>151</b> | <b>100%</b> |

**Interpretation:**

The above chart illustrates 151 respondents' self-reported awareness of recycling and trash reuse methods. It reveals that a significant majority 66.9% rate their level of awareness as "Very High" or "High." In addition, just 7.9% of those surveyed believe their awareness is low, while 25.2% maintain a reasonable level of knowledge. Overall, the data points to a solid base of environmental awareness among the participants, with the majority feeling informed about the topic.

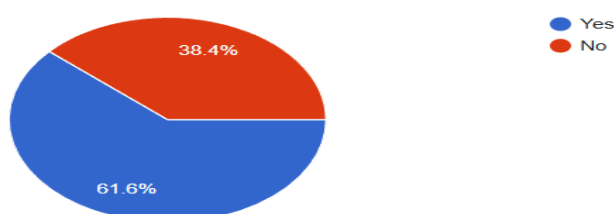
**Fig 7.7**

| Sr No. | Do you participate in recycling or reuse activities at home or in your community? | Number of Respondents | Percentage of Respondents |
|--------|-----------------------------------------------------------------------------------|-----------------------|---------------------------|
| 1      | Yes regularly                                                                     | 54                    | 35.8%                     |
| 2      | Occasionally                                                                      | 48                    | 31.8%                     |
| 3      | Rarely                                                                            | 39                    | 25.8%                     |
| 4      | Never                                                                             | 10                    | 6.6%                      |
|        | <b>Total</b>                                                                      | <b>151</b>            | <b>100%</b>               |

**Interpretation:**

The above chart illustrates the 151 respondents' participation in environmental sustainability initiatives. It shows that 35.8% of the group frequently participates in these activities, whereas 31.8% does so very rarely. In addition, the study indicates that 32.4% of respondents either rarely or never participate in recycling or reuse initiatives. Overall, the results indicate that while most people surveyed are involved in sustainability, an important part of the population is still not.

**Have you ever participated in a Trash-to-Treasure or recycling competition/event?**  
151 responses

**Fig 7.8**

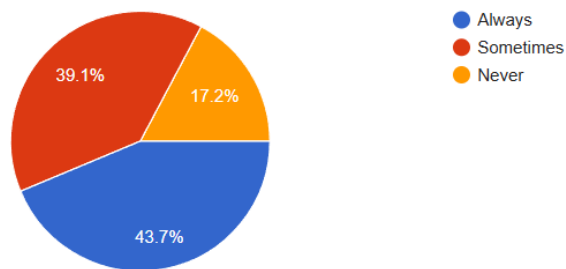
| Sr No. | Have you ever participated in a Trash-to-Treasure or recycling competition/event? | Number of Respondents | Percentage of Respondents |
|--------|-----------------------------------------------------------------------------------|-----------------------|---------------------------|
| 1      | Yes                                                                               | 93                    | 61.6%                     |
| 2      | No                                                                                | 58                    | 38.4%                     |
|        | <b>Total</b>                                                                      | <b>151</b>            | <b>100%</b>               |

**Interpretation:**

The above chart shows the responses when asked if they had ever part in a recycling or Trash-to-Treasure competition or event. The majority of participants, or 61.6% of the 151 respondents, said they have taken part in such events. In contrast, 38.4% of those surveyed said they had never taken part in a Trash-to-Treasure or recycling competition. This indicates that a significant portion of respondents had previously engaged in recycling and innovative waste material reuse. It shows a relatively high degree of participation and awareness of sustainability projects. The existence of responders who have not taken part, however, indicates that there is still room to encourage greater involvement in such eco-friendly activities.

**Do you practice waste segregation at home?**

151 responses

**Fig 7.9**

| Sr No. | Do you practice waste segregation at home? | Number of Respondents | Percentage of Respondents |
|--------|--------------------------------------------|-----------------------|---------------------------|
| 1      | Always                                     | 66                    | 43.7%                     |
| 2      | Sometimes                                  | 59                    | 39.1%                     |
| 3      | Never                                      | 26                    | 17.2%                     |
|        | <b>Total</b>                               | <b>151</b>            | <b>100%</b>               |

**Interpretation:**

The above chart illustrates the responses to the question of whether individuals segregate their waste at home. 43.7% of the 151 respondents said they always separate their waste at home. On the other hand, 39.1% of respondents said they sometimes separate their waste, while 17.2% said they never do so. This implies that while many respondents frequently separate their garbage, a sizable portion only do so on occasion. Furthermore, a smaller percentage of responders do not segregate their waste at all. These results show that while individuals are aware of the need for good waste management, they still need to be pushed and to educate to implement consistent waste segregation processes at home in order to improve environmental sustainability.

## What motivates you to participate in recycling activities?



151 responses

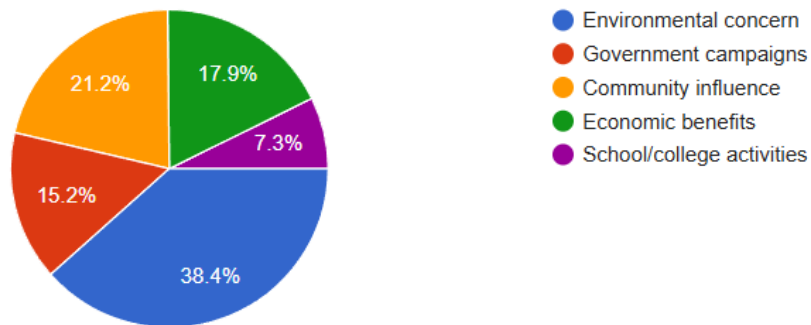


Fig 7.10

| Sr No. | What motivates you to participate in recycling activities? | Number of Respondents | Percentage of Respondents |
|--------|------------------------------------------------------------|-----------------------|---------------------------|
| 1      | Environmental concern                                      | 58                    | 38.4%                     |
| 2      | Government campaigns                                       | 23                    | 15.2%                     |
| 3      | Community influence                                        | 32                    | 21.2%                     |
| 4      | Economic benefits                                          | 27                    | 17.9%                     |
| 5      | School/college activities                                  | 11                    | 7.3%                      |
|        | <b>Total</b>                                               | <b>151</b>            | <b>100%</b>               |

**Interpretation:**

The above chart illustrates the Many factors that encourage people to engage in recycling activities. The majority of the 151 participants 38.4% said that their involvement in recycling programs is primarily driven by environmental concerns. This indicates that an abundance of people is aware of environmental problems and are eager to support sustainability. Furthermore, 17.9% of respondents are driven by financial incentives or cost savings from recycling techniques, while 21.2% are impacted by community involvement. 15.2% of respondents said that government efforts motivate them, showing the importance of public awareness initiatives in promoting sustainable behavior. Only 7.3% of respondents said that their participation in school or college activities encourages them to do so. Overall, the findings indicate that while community influence, economic benefits, and government initiatives all support sustainable behaviors, environmental knowledge is the most significant variable in encouraging people to take part in recycling activities.

**Are waste segregation bins available in your locality?**

151 responses

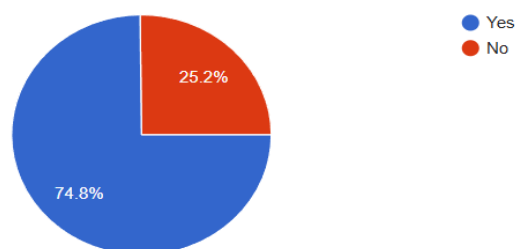


Fig 7.11

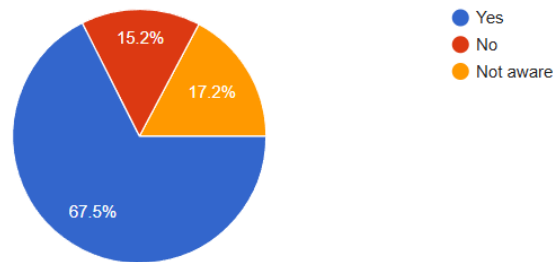
| Sr No. | Are waste segregation bins available in your locality? | Number of Respondents | Percentage of Respondents |
|--------|--------------------------------------------------------|-----------------------|---------------------------|
| 1      | Yes                                                    | 113                   | 74.8%                     |
| 2      | No                                                     | 38                    | 25.2%                     |
|        | <b>Total</b>                                           | <b>151</b>            | <b>100%</b>               |

**Interpretation:**

The above chart represents the responses on the existence of waste segregation bins in the respondents' area. 74.8% of the 151 respondents said that garbage segregation containers are available in their area. On the other hand, 25.2% of the respondents stated that their place of residence does not have such trash cans. This indicates that a lot of respondents have access to facilities for waste segregation, which can help with proper recycling and disposal of waste. The responses do, however, also show that a significant number of communities still lack sufficient infrastructure for waste segregation. Therefore, in order to encourage improved environmental practices within communities, it is necessary to further increase the provision of appropriate waste management facilities.

**Does your area have regular waste collection services?**

151 responses

**Fig 7.12**

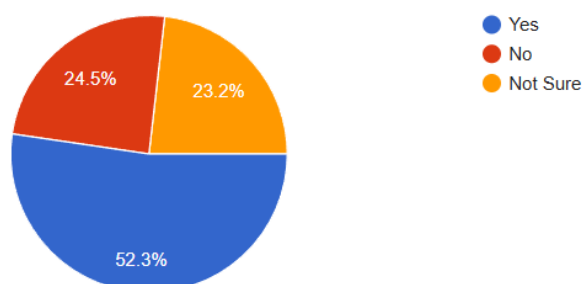
| Sr No. | Does your area have regular waste collection services? | Number of Respondents | Percentage of Respondents |
|--------|--------------------------------------------------------|-----------------------|---------------------------|
| 1      | Yes                                                    | 102                   | 67.5%                     |
| 2      | No                                                     | 23                    | 15.2%                     |
| 3      | Not aware                                              | 26                    | 17.2%                     |
|        | <b>Total</b>                                           | <b>151</b>            | <b>100%</b>               |

**Interpretation:**

The above chart illustrates the Regular trash collection services are offered based on the respondents. The majority of the community has access to basic waste management infrastructure, as demonstrated by the fact that 67.5% of the 151 respondents said their region receives regular waste collection. However, 17.2% of respondents said they were unaware of any such services in their area, and 15.2% of respondents said they do not have access to these services. This total of 32.4% indicates that a significant portion of the populace either lacks necessary infrastructure for collecting waste or is aware of current municipal regulations. These results show that in order to make sure locals are aware of the alternatives to disposal accessible to them, garbage collection routes have to be extended to underserved areas and public communication must be improved.

**Are recycling facilities or collection centers available nearby?**

151 responses

**Fig 7.13**

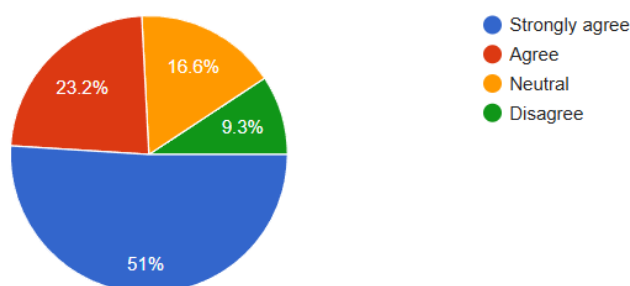
| Sr No. | Are recycling facilities or collection centers available nearby? | Number of Respondents | Percentage of Respondents |
|--------|------------------------------------------------------------------|-----------------------|---------------------------|
| 1      | Yes                                                              | 79                    | 52.3%                     |
| 2      | No                                                               | 37                    | 24.5%                     |
| 3      | Not Sure                                                         | 35                    | 23.2%                     |
|        | <b>Total</b>                                                     | <b>151</b>            | <b>100%</b>               |

**Interpretation:**

The above chart illustrates the respondents' perception on the accessibility of collection or recycling facilities. More than half of the community has access to recycling infrastructure, as evidenced by the 52.3% of 151 participants who said that such facilities are available nearby. However, 24.5% of respondents said there were no facilities available, and 23.2% were uncertain if they exist. This shows that almost half of the respondents 47.7% either have no idea about or lack access to local recycling options. The findings suggest that in order to increase recycling participation, more localized collection locations and social interaction are required.

**Do you think better waste management facilities would increase participation in recycling activities?**

151 responses

**Fig 7.14**

| Sr No. | Response Category | Number of Respondents | Percentage of Respondents |
|--------|-------------------|-----------------------|---------------------------|
| 1      | Strongly agree    | 77                    | 51.0%                     |
| 2      | Agree             | 35                    | 23.2%                     |

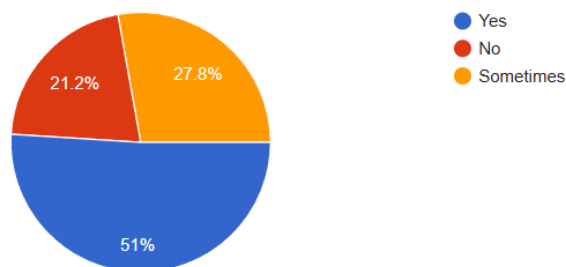
|   |              |            |             |
|---|--------------|------------|-------------|
| 3 | Neutral      | 25         | 16.6%       |
| 4 | Disagree     | 14         | 9.3%        |
|   | <b>Total</b> | <b>151</b> | <b>100%</b> |

**Interpretation:**

The above chart shows the respondents' thoughts on whether more recycling participation would result from better waste management facilities. With 51% strongly agreeing and 23.2% agreeing with the statement, a significant proportion of participants had a positive outlook. The public's strong belief that infrastructure quality is the main factor influencing community involvement in environmental projects is shown by the combined total of 74.2%. However, 9.3% of respondents disagreed, and 16.6% of respondents were neutral. These findings imply that although the majority of people think better facilities are the answer, just a small number of people may think other factors like personal habits or a lack of education are more significant than facilities alone. Overall, the data shows that the most effective method to increase local recycling rates may be to invest in better waste disposal infrastructure.

**Do people in your community actively participate in environmental initiatives?**

151 responses



**Fig 7.15**

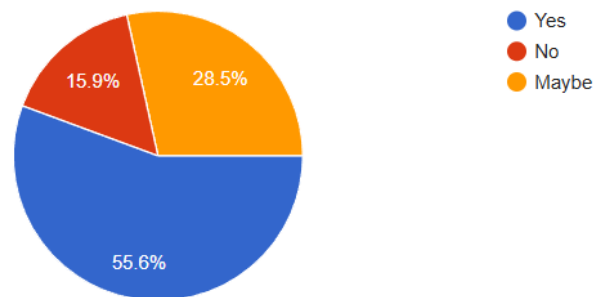
| Sr No. | Do people in your community actively participate in environmental initiatives? | Number of Respondents | Percentage of Respondents |
|--------|--------------------------------------------------------------------------------|-----------------------|---------------------------|
| 1      | Yes                                                                            | 77                    | 51%                       |
| 2      | No                                                                             | 32                    | 21.2%                     |
| 3      | Sometimes                                                                      | 42                    | 27.8%                     |
|        | <b>Total</b>                                                                   | <b>151</b>            | <b>100%</b>               |

**Interpretation:**

The above chart illustrates the level of community engagement in environmental initiatives as perceived by the respondents. Of the 151 responses, 51% said that members of their community actively participate, indicating that over half of the population has a relatively strong culture of environmental responsibility. In addition, 27.8% of respondents said they participate Sometimes, but 21.2% said they are not involved actively. This shows that even while there is a solid foundation of participation, a significant number of the general population 49% is either inconsistent or uninvolved. These results imply that even though there are initial interest, more regular community events and inspirational campaigns may be able to turn infrequent participants into regular, active donors to environmental initiatives.

**Would you be willing to participate in future Trash-to-Treasure activities?**

151 responses

**Fig 7.16**

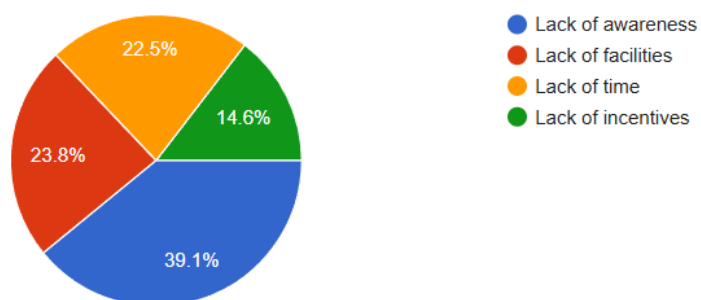
| Sr No. | Response Category | Number of Respondents | Percentage of Respondents |
|--------|-------------------|-----------------------|---------------------------|
| 1      | Yes               | 84                    | 55.6%                     |
| 2      | No                | 24                    | 15.9%                     |
| 3      | Maybe             | 43                    | 28.5%                     |
|        | <b>Total</b>      | <b>151</b>            | <b>100%</b>               |

**Interpretation:**

The above chart illustrates the willingness of respondents to participate in future Trash-to-Treasure activities. Out of the 151 total participants 55.6% of those surveyed said that were certainly interested to participate in future projects. This suggests a high degree of community support and engagement for the program's growth. In addition, 28.5% of respondents said Maybe, while only 15.9% said they weren't going to take part. The large maybe group indicates that more than 25% of individuals are ready to participate but might need more details, more convenient timing, or various kinds of activities before they are fully convinced. Overall, these results are very encouraging, suggesting that the program may achieve a participation rate of more than 80% if it improves outreach and responds to community needs.

**What do you think is the biggest barrier to participation?**

151 responses

**Fig 7.17**

| Sr No. | Response Category  | Number of Respondents | Percentage of Respondents |
|--------|--------------------|-----------------------|---------------------------|
| 1      | Lack of awareness  | 59                    | 39.1%                     |
| 2      | Lack of facilities | 36                    | 23.8%                     |

|   |                    |            |             |
|---|--------------------|------------|-------------|
| 3 | Lack of time       | 34         | 22.5%       |
| 4 | Lack of incentives | 22         | 14.6%       |
|   | <b>Total</b>       | <b>151</b> | <b>100%</b> |

**Interpretation:**

The above chart identifies the major obstacles that the respondents felt prevented community involvement in initiatives. "Lack of awareness" was identified by 39.1% of participants as the largest obstacle out of 151 responses. This means that increasing communication and educational outreach methods is the single most effective strategy for increasing involvement. "Lack of facilities" (23.8%) and "Lack of time" (22.5%) were shown to be almost equal secondary barriers after awareness. This means that the physical infrastructure needs to be easily accessible to those with busy schedules after they are informed about the activities. At 14.6%, "lack of incentives" was the least important barrier, suggesting that most respondents are internally motivated to take part if the facilities and information are readily available. When everything is considered, the data recommends a dual-focus strategy: starting a strong awareness campaign and making sure the physical facilities are readily available to the wider community.

**Hypothesis:**

Chi Square Test

**Hypothesis Test-1**

**H<sub>0</sub>:** There is no significant association between gender and participation in community-based environmental initiatives under the Trash-to-Treasure Challenge.

**H<sub>1</sub>:** There is a significant association between gender and participation in community-based environmental initiatives under the Trash-to-Treasure Challenge.

| Count of Gender | Column Labels |           |             |
|-----------------|---------------|-----------|-------------|
| Row Labels      | No            | Yes       | Grand Total |
| Female          | 28            | 39        | 67          |
| Male            | 30            | 54        | 84          |
| Grand Total     | <b>58</b>     | <b>93</b> | <b>151</b>  |

| Observed | Row Labels          | No        | Yes       | Row Total  |                    |
|----------|---------------------|-----------|-----------|------------|--------------------|
|          | Female              | 28        | 39        | 67         |                    |
|          | Male                | 30        | 54        | 84         |                    |
|          | <b>Column Total</b> | <b>58</b> | <b>93</b> | <b>151</b> | <b>Grand Total</b> |

| Expected | Row Labels | No          | Yes       |
|----------|------------|-------------|-----------|
|          | Female     | 25.73509934 | 41.264901 |
|          | Male       | 32.26490066 | 51.735099 |

| (O-E) <sup>2</sup> /E | Row Labels | No          | Yes       |
|-----------------------|------------|-------------|-----------|
|                       | Female     | 0.199329909 | 0.1243133 |

|  |      |             |           |
|--|------|-------------|-----------|
|  | Male | 0.158989332 | 0.0991546 |
|--|------|-------------|-----------|

|                |             |
|----------------|-------------|
| <b>Xsquare</b> | 0.581787155 |
| <b>df</b>      | 1           |
| <b>p-value</b> | 0.445612665 |

**Interpretation:**

The relationship between gender as well as participation in community-based environmental initiatives under the Trash-to-Treasure Challenge was examined using the Chi-square test. The corresponding degrees of freedom and p-value were bought along with the computed Chi-square value. The alternative hypothesis is rejected and the null hypothesis is accepted because the p-value above the significance level of 0.05. It indicates that involvement in community-based environmental initiatives is not statistically strongly impacted by gender. Therefore, a respondent's gender has no impact on their involvement in recycling and environmental initiatives. Both genders show similar levels of engagement in these initiatives that are community-focused.

**Hypothesis Test-2**

**H<sub>0</sub>:** There is no significant relationship between awareness of the Trash-to-Treasure Challenge and participation in recycling activities.

**H<sub>1</sub>:** There is a significant relationship between awareness of the Trash-to-Treasure Challenge and participation in recycling activities.

| Count of Have you heard about the Trash-to-Treasure Challenge? | Column Labels |              |        |               |             |
|----------------------------------------------------------------|---------------|--------------|--------|---------------|-------------|
| Row Labels                                                     | Never         | Occasionally | Rarely | Yes regularly | Grand Total |
| No                                                             | 2             | 12           | 10     | 6             | 30          |
| Unaware                                                        | 2             | 6            | 14     | 11            | 33          |
| Yes                                                            | 6             | 30           | 15     | 37            | 88          |
| Grand Total                                                    | 10            | 48           | 39     | 54            | 151         |

| Observed | Row Labels   | Never | Occasionally | Rarely | Yes regularly | Row Total |             |
|----------|--------------|-------|--------------|--------|---------------|-----------|-------------|
|          | No           | 2     | 12           | 10     | 6             | 30        |             |
|          | Unaware      | 2     | 6            | 14     | 11            | 33        |             |
|          | Yes          | 6     | 30           | 15     | 37            | 88        |             |
|          | Column Total | 10    | 48           | 39     | 54            | 151       | Grand Total |

| Expected | Row Labels | Never       | Occasionally | Rarely  | Yes regularly |
|----------|------------|-------------|--------------|---------|---------------|
|          | No         | 1.986754967 | 9.53642384   | 7.74834 | 10.7284768    |
|          | Unaware    | 2.185430464 | 10.4900662   | 8.52318 | 11.8013245    |

|  |     |            |            |         |            |
|--|-----|------------|------------|---------|------------|
|  | Yes | 5.82781457 | 27.9735099 | 22.7285 | 31.4701987 |
|--|-----|------------|------------|---------|------------|

| (O-E) <sup>2</sup> /E | Row Labels | Never       | Occasionally | Rarely  | Yes regularly |
|-----------------------|------------|-------------|--------------|---------|---------------|
|                       | No         | 8.83002E-05 | 0.63642384   | 0.65433 | 2.08403238    |
|                       | Unaware    | 0.015733494 | 1.92188441   | 3.51929 | 0.05441092    |
|                       | Yes        | 0.005087297 | 0.14680539   | 2.62795 | 0.97167174    |

|                |                   |
|----------------|-------------------|
| <b>Xsquare</b> | <b>12.6377112</b> |
| df             | 6                 |
| p-value        | 0.04916377        |

**Interpretation:**

The connection between engagement in recycling activities and an understanding of the Trash-to-Treasure Challenge was investigated using the Chi-square test. The cross-tabulated data was analyzed to determine the Chi-square value and associated p-value. The alternative hypothesis is accepted and the null hypothesis is rejected since the p-value is below the significance level of 0.05. This suggests that engagement in recycling efforts and knowledge of the Trash-to-Treasure Challenge are statistically strongly linked. According to the findings, those who are more aware of the program are more likely to take part in local waste disposal and recycling programs.

**Hypothesis Test-3**

**H<sub>0</sub>:** There is no significant association between the availability of recycling facilities and participation in recycling activities.

**H<sub>1</sub>:** There is a significant association between the availability of recycling facilities and participation in recycling activities.

| Count of Are recycling facilities or collection centers available nearby? | Column Labels |              |           |               |             |
|---------------------------------------------------------------------------|---------------|--------------|-----------|---------------|-------------|
| Row Labels                                                                | Never         | Occasionally | Rarely    | Yes regularly | Grand Total |
| No                                                                        | 2             | 20           | 7         | 8             | 37          |
| Not Sure                                                                  | 4             | 7            | 16        | 8             | 35          |
| Yes                                                                       | 4             | 21           | 16        | 38            | 79          |
| Grand Total                                                               | <b>10</b>     | <b>48</b>    | <b>39</b> | <b>54</b>     | <b>151</b>  |

| Observed | Row Labels          | Never     | Occasionally | Rarely    | Yes regularly | Row total  |                    |
|----------|---------------------|-----------|--------------|-----------|---------------|------------|--------------------|
|          | No                  | 2         | 20           | 7         | 8             | 37         |                    |
|          | Not Sure            | 4         | 7            | 16        | 8             | 35         |                    |
|          | Yes                 | 4         | 21           | 16        | 38            | 79         |                    |
|          | <b>Column Total</b> | <b>10</b> | <b>48</b>    | <b>39</b> | <b>54</b>     | <b>151</b> | <b>Grand Total</b> |

| Expected | Row Labels | Never       | Occasionally | Rarely      | Yes regularly |
|----------|------------|-------------|--------------|-------------|---------------|
|          | No         | 2.450331126 | 11.7615894   | 9.556291391 | 13.2317881    |
|          | Not Sure   | 2.317880795 | 11.1258278   | 9.039735099 | 12.5165563    |
|          | Yes        | 5.231788079 | 25.1125828   | 20.40397351 | 28.2516556    |

| (O-E) <sup>2</sup> /E | Row Labels | Never       | Occasionally | Rarely      | Yes regularly |
|-----------------------|------------|-------------|--------------|-------------|---------------|
|                       | No         | 0.082763558 | 5.77059841   | 0.683803518 | 2.06862492    |
|                       | Not Sure   | 1.220737938 | 1.52999448   | 5.359149019 | 1.6297838     |
|                       | Yes        | 0.290015928 | 0.6735005    | 0.950549297 | 3.36370439    |

|                |                    |
|----------------|--------------------|
| <b>Xsquare</b> | <b>23.62322576</b> |
| df             | 6                  |
| p-value        | 0.000612487        |

**Interpretation:**

The relationship between the availability of recycling facilities and participation in recycling activities was analyzed using the Chi-square test. Cross-tabulated data were examined to compute the Chi-square statistic and the corresponding p-value. The calculated Chi-square value is 23.623 with 6 degrees of freedom, and the p-value is 0.00061249.

Since the p-value is less than the significance level of 0.05, the null hypothesis is rejected and the alternative hypothesis is accepted. This indicates a statistically significant association between the availability of recycling facilities and participation in recycling activities. The findings suggest that individuals with better access to recycling facilities are more likely to engage in recycling, whereas limited facility availability may reduce community participation in waste management practices.

**Hypothesis Test-4**

**H<sub>0</sub>** There is no significant association between community awareness/environmental concern and the practice of waste segregation and recycling.

**H<sub>1</sub>** There is a significant association between community awareness/environmental concern and the practice of waste segregation and recycling.

**The variables considered were:**

- Level of awareness about recycling and waste reuse (Very High, High, Moderate, Low)
- Practice of waste segregation at home (Always, Sometimes, Never)

| Chi-Square Test: Awareness vs Waste Segregation |        |           |       |
|-------------------------------------------------|--------|-----------|-------|
|                                                 |        |           |       |
| Observed Frequencies                            |        |           |       |
|                                                 | Always | Sometimes | Never |
| Very High                                       | 34     | 15        | 4     |
| High                                            | 20     | 22        | 6     |

|                              |             |           |        |
|------------------------------|-------------|-----------|--------|
| Moderate                     | 10          | 17        | 11     |
| Low                          | 2           | 5         | 5      |
|                              |             |           |        |
| <b>Expected Frequencies</b>  |             |           |        |
|                              | Always      | Sometimes | Never  |
| Very High                    | 23.166      | 20.709    | 9.126  |
| High                         | 20.98       | 18.755    | 8.265  |
| Moderate                     | 16.609      | 14.848    | 6.543  |
| Low                          | 5.245       | 4.689     | 2.066  |
|                              |             |           |        |
| <b>(O-E)<sup>2</sup> / E</b> |             |           |        |
|                              | Always      | Sometimes | Never  |
| Very High                    | 5.0672      | 1.5737    | 2.8791 |
| High                         | 0.0458      | 0.5615    | 0.6207 |
| Moderate                     | 2.63        | 0.312     | 3.036  |
| Low                          | 2.0077      | 0.0207    | 4.1656 |
|                              |             |           |        |
|                              |             |           |        |
| Chi-Square Value             | 22.91976538 |           |        |
| Degrees of Freedom           | 6           |           |        |

p Value =0.00083

Since  $p < 0.05$ , the null hypothesis is rejected and the alternative hypothesis is accepted.

he results indicate a statistically significant relationship between environmental awareness and waste segregation practices. Respondents with higher levels of awareness were more likely to consistently segregate waste and participate in recycling activities. Conversely, respondents with lower awareness levels showed irregular or minimal participation in waste management practices.

This suggests that environmental concern and knowledge act as important behavioral drivers, motivating individuals to adopt sustainable practices such as recycling, waste segregation, and participation in environmental initiatives.

### Findings

- Based on the study, community engagement in recycling and waste management efforts is significantly enhanced by knowledge of the Trash-to-Treasure Challenge. Compared to those who were not aware of the effort, those who were were more likely to engage in recycling efforts.
- The Chi-square analysis's findings show that participation in local environmental projects is not much statistically significantly affected by gender. This indicates that different gender groups had various degrees of participation, suggesting the need for inclusive engagement methods.
- Participation in trash segregation and recycling activities was found to be positively correlated with the availability of local waste management facilities, such as recycling centers, waste collection services, and segregation bins.

- Many people indicated that community influence and environmental concern are strong incentives for recycling and reuse.
- The study also found that the primary barriers keeping people from actively engaging in environmental initiatives are a lack of expertise, insufficient resources, and time constraints.
- If proper backing structures are put in place, a significant number of respondents indicated that they would be willing to take part in future Trash-to-Treasure events, indicating the possibility of greater involvement in the community.
- The study shows that 44.4% of respondents are women and 55.6% of respondents are men, indicating that both genders are actively involved in trash management programs and environmental awareness.
- Young adults make up the greatest group engaged in sustainability and community projects, with 41.1% of respondents being between the ages of 18 and 30, 31.8% having between the ages of 31 and 45, and 27.2% having more than 46.
- Based to the survey, 66.9% of participants say they are very aware of environmental issues, compared to 25.2% who say they are somewhat aware and 7.9% that say they are not.
- Participation levels are still moderate, as seen by the findings that 35.8% of respondents frequently engage in environmental activities, 31.8% participate very rarely, and 32.4% rarely or never participate.
- There's potential for more community involvement, as demonstrated by the fact that 55.6% of respondents are willing to take part in future Trash-to-Treasure initiatives, while 28.5% are uncertain and 15.9% are unwilling.
- Based on the study, 74.2% of the respondents think that improved waste management infrastructure would boost community engagement in recycling initiatives.
- Environmental awareness plays a crucial role in influencing sustainable waste management behaviour.
- A majority of respondents who reported high or very high awareness also practiced waste segregation regularly.
- Environmental concern was identified as the primary motivation for recycling by 38.4% of respondents, making it the most influential factor encouraging participation.
- The results demonstrate that knowledge alone is not sufficient, but when combined with community motivation and accessible facilities, it significantly increases environmentally responsible behaviour.
- Communities with stronger environmental awareness tend to show higher participation in recycling and reuse activities.

### **Recommendation**

- To boost public participation, expand Trash-to-Treasure Challenge awareness campaigns via social media, educational institutions, and community initiatives.
- Improve the number of segregation bins, recycling centers, and regular garbage collection services in residential areas to improve the waste management infrastructure.
- Encourage community involvement activities like recycling competitions, seminars, and awareness initiatives that encourage people to adopt sustainable waste disposal techniques.
- Recycling awareness and environmental responsibility should be actively promoted among students and locals by educational institutions and community organizations.
- Communities that take part in recycling and trash management duties should be rewarded or given recognition by the government and local authorities.
- By offering easy recycling facilities and adaptable community activities that promote broader involvement, efforts should be made to lower barriers to participation.

- In order to address the lack of awareness found among a portion of respondents, the study recommends strengthening waste management and recycling awareness programs through campaigns, workshops, and social media activities.
- Initiatives like the Trash-to-Treasure Challenge under the Swachh Bharat Mission ought to be promoted by government departments and local organizations as they foster innovative waste material reuse and promote community engagement.
- To improve community engagement in environmental activities, it is recommended that resident welfare associations and community organizations plan regular recycling drives and cleanliness drives.
- Due to the study, local communities should be encouraged to embrace the idea of a circular economy, which reduces environmental pollution by recycling, reusing, and turning waste materials into useful products.
- It is recommended that policymakers and local authorities strengthen environmental awareness campaigns and community engagement programs to promote greater participation in waste segregation and recycling practices.

### **Managerial Implications**

The findings of the study provide several important implications for policymakers, environmental managers, and community organizations.

The findings suggest that increasing environmental awareness can significantly improve community participation in waste segregation and recycling practices. Policymakers and local authorities should focus on conducting awareness campaigns and educational programs to promote responsible waste management behaviour. Providing adequate waste management infrastructure, such as segregation bins and recycling facilities, can further encourage participation. Community organizations and educational institutions can play an important role in motivating individuals through workshops and sustainability initiatives. Strengthening collaboration between government bodies and local communities will help achieve more effective and sustainable waste management outcomes.

### **Conclusion**

The study highlights how crucial community involvement is to achieving sustainable trash management under the Trash-to-Treasure Challenge program. The results show that participation in recycling and environmental activities is highly influenced by factors including awareness of the program, gender inequalities, and the availability of waste management facilities. Based on the data, people are more likely to recycle if they are aware of the program and have access to adequate waste management infrastructure. At the same time, community involvement levels continue to be affected by obstacles including inadequate facilities and misinformation. Overall, the study comes to the conclusion that the effectiveness of environmental programs like the Trash-to-Treasure Challenge depends on raising awareness, enhancing infrastructure, and promoting community involvement. Improving cooperation between government agencies, regional communities, and academic institutions can boost participation and advance our general objective of achieving a cleaner, greener India.

The study also highlights the significant role of environmental awareness and concern in influencing recycling behaviour. The statistical analysis confirms that individuals with higher awareness levels are more likely to practice waste segregation and participate in recycling initiatives. Environmental concern emerged as the strongest motivational factor for community engagement in waste management activities. Therefore, strengthening awareness campaigns and environmental education programs can significantly enhance community participation and promote sustainable waste management practices.

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