



Household Waste Segregation and Recycling Behaviour: A Study of Urban Waste Disposal System

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Abstract:- In urban areas, rapid urbanization, population growth, changing consumption habits, and poor waste management have driven a major rise in household waste. While proper segregation and recycling are essential to protect the environment and conserve resources, success depends heavily on how responsibly households participate. This study investigates urban household waste segregation and recycling behaviors, highlighting key influencing factors and operational challenges. Household waste management has become a significant environmental concern in urban areas due to rapid urbanization, population growth, changing lifestyles, and increasing consumption of goods. The improper disposal of household waste contributes to environmental pollution, public health problems, blocked drainage systems, and the degradation of urban surroundings. Household waste segregation and recycling are essential practices for reducing the amount of waste sent to landfills, conserving natural resources, and promoting sustainable urban development. However, the effectiveness of waste management systems depends not only on municipal infrastructure but also on the awareness, attitudes, and active participation of households. The present study aims to examine household waste segregation and recycling behaviour within the urban waste disposal system. It focuses on understanding the waste management practices adopted by urban households, their level of awareness regarding waste segregation, and the factors influencing their participation in recycling activities. Furthermore, this study identifies the main obstacles households encounter when sorting biodegradable, non-biodegradable, and hazardous waste at the source. Factors like education, environmental awareness, bin availability, collection consistency, and facility access are evaluated to understand disposal habits. The study utilizes a descriptive research design, gathering primary data via structured household questionnaires alongside secondary data from relevant literature and government reports. Data analysis employs percentage analysis, frequency distributions, tables, and graphs to map key trends and patterns. The study is expected to highlight the importance of environmental education, community participation, efficient municipal waste collection, and accessible recycling facilities in improving urban waste disposal systems. It may further suggest measures such as awareness campaigns, source-level waste segregation, incentives for recycling, and stronger coordination between households and municipal authorities. The findings may help policymakers and urban local bodies develop effective strategies for improving household waste management and encouraging environmentally responsible behaviour. Overall, the study emphasizes that a sustainable urban waste disposal system requires the combined efforts of individuals, communities, municipal authorities, and recycling agencies. Promoting responsible waste segregation and recycling practices can contribute to cleaner urban environments, better public health, and the achievement of long-term environmental sustainability.

Keywords: Household Waste Segregation, Recycling Behaviour, Urban Waste Disposal System, Solid Waste Management, Environmental Awareness, Sustainable Development.

1. INTRODUCTION:

Globally, waste management has become a critical environmental crisis, especially in fast-growing cities. Population growth, urbanization, industrialization, and changing consumer habits have drastically accelerated household waste generation. Poor disposal practices trigger environmental pollution, health hazards, soil and water

contamination, and clogged drainage networks. Therefore, proper waste management is crucial for public health and sustainable urban growth. Household waste includes everything from daily domestic routines, such as food waste, packaging, and cleaning products. It is broadly categorized into biodegradables, recyclables, and household hazardous waste (like batteries and chemicals). Mixing these types limits recycling and composting while overwhelming municipal landfills.



As a result, segregating waste at the source remains the most vital step toward sustainable solid waste management." Household waste segregation involves separating waste into different categories before it is collected or disposed of. This practice enables biodegradable waste to be processed through composting, while recyclable materials can be recovered and reused in the production process. Proper segregation also reduces the quantity of waste transported to landfills and helps minimise environmental damage.

However, the success of waste segregation depends significantly on the willingness and ability of households to adopt appropriate waste management practices in their daily lives. As a core element of sustainable waste management, recycling transforms discarded materials into new products, conserving raw resources and energy. It drives the circular economy by keeping materials in use for as long as possible. However, household recycling in urban areas is often hindered by common systemic barriers, including poor awareness, weak infrastructure, irregular collection schedules, a lack of separate bins, and distant recycling facilities. Economic, psychological, and institutional dynamics heavily influence how households manage waste.

Factors like education, income, family size, available home space, and environmental attitudes dictate an individual's willingness to segregate and recycle. However, public cooperation relies just as heavily on institutional support. Even when households are highly motivated to sort their waste, irregular collection schedules or the practice of mixing segregated waste during transit act as major disincentives, undermining long-term community participation.

Managing municipal solid waste in India is increasingly urgent as rapid growth strains urban infrastructure and public utilities. Although municipal bodies oversee waste disposal and national programs like the Swachh Bharat Mission aggressively promote sanitation, policy alone is insufficient. Lasting progress requires structural infrastructure, community cooperation, and synchronized efforts between households and municipal authorities. Consequently, top-down policies must be matched by bottom-up behavioral shifts at the domestic level. Evaluating an urban waste system is incomplete without analyzing household actions.

To design realistic waste strategies, researchers must identify what drives households to recycle, what stops them from sorting waste, and how consistently they practice segregation. Crucially, the study must examine the disconnect between public environmental awareness and actual daily behavior, especially when confronted with unreliable municipal and recycling services. This study, "household waste segregation and recycling behaviour: a study of urban waste disposal system," investigates domestic waste segregation and recycling habits in urban settings. The research identifies the main drivers of household

participation, evaluates the barriers to sustainable waste separation, and assesses how municipal efficiency and environmental awareness influence disposal practices. By analyzing primary data from urban households and supporting secondary literature, the study highlights key operational gaps and offers actionable insights for system improvements. The study is expected to provide useful insights for policymakers, municipal authorities, environmental organizations, and urban communities. The study may recommend practical measures such as awareness campaigns, the provision of separate waste collection facilities, regular door-to-door collection, improved recycling infrastructure, and community-based initiatives. Ultimately, the study emphasises that effective urban waste management requires a combination of responsible household behaviour, efficient public services, and sustainable environmental policies. Encouraging waste segregation and recycling at the household level can contribute to cleaner cities, healthier communities, resource conservation, and long-term environmental sustainability.

II. METHODOLOGY

The present study, entitled "*Household waste segregation and recycling behaviour: a study of urban waste disposal system*," adopts a descriptive and analytical research design. The descriptive approach aims to understand existing household waste segregation, recycling, and disposal practices in urban areas. The analytical approach examines the factors influencing household behaviour, including environmental awareness, educational background, socioeconomic conditions, availability of waste collection facilities, and municipal services. The study also seeks to identify the major barriers that prevent households from adopting sustainable waste management practices.

1. Nature of the Study

This study is primarily empirical, investigating real-world waste management practices within urban households. By integrating both quantitative and qualitative information, the research provides a holistic understanding of household participation, public awareness, civic attitudes, and the practical challenges of waste segregation and recycling.

1. Study area

2. This research focuses on specific urban residential zones. The study areas are selected based on key criteria: population density, housing diversity, access to municipal waste collection, and ease of data gathering. The precise geographical boundaries will be explicitly defined once the final field locations are secured by the researcher.

2. Population and Sample Size

The target population consists of households residing in the selected urban areas. One adult member from each selected



household may be approached to provide information about household waste generation, segregation, recycling, and disposal practices. The sample size will depend on the scope of the study, available resources, and the requirements of the research.

3. Sampling Technique

A suitable sampling technique, such as stratified random sampling or simple random sampling, may be used to select respondents. Stratified sampling can help ensure representation from different residential areas or socioeconomic groups. Where a complete sampling frame is unavailable, convenience sampling may be used, with its limitations clearly acknowledged.

4. Sources of Data

- **Primary data:** Primary data may be collected directly from urban households through a structured questionnaire. The questionnaire may include questions concerning household characteristics, waste segregation habits, recycling frequency, environmental awareness, municipal collection services, and difficulties experienced in waste disposal. Short interviews may also be conducted where necessary.
- **Secondary data:** Secondary data may be obtained from government reports, municipal publications, academic journals, research papers, books, and official documents related to solid waste management, recycling, environmental awareness, and urban sustainability.

5. Research Instrument

Primary data will be gathered using a structured questionnaire as the principal research tool. The instrument features a combination of multiple-choice, closed-ended, and scale-based questions. To ensure clarity and data quality, a pilot test will be conducted on a small focus group before launching the main survey. This initial screening allows for necessary revisions to maximize the questionnaire's reliability and response accuracy.

III. HYPOTHESES OF THE STUDY:

The present study aims to examine household waste segregation and recycling behaviour in urban areas and to identify the factors influencing sustainable waste management practices. The following null and alternative hypotheses are proposed:

H₀₁ (null hypothesis): There is no significant relationship between environmental awareness and household waste segregation behaviour in urban areas.

H₁₁ (alternative hypothesis): There is a significant relationship between environmental awareness and household waste segregation behaviour in urban areas.

H₀₂ (null hypothesis): There is no significant association between educational level and household recycling behaviour.

H₁₂ (alternative hypothesis): There is a significant association between educational level and household recycling behaviour.

H₀₃ (null hypothesis): The availability and regularity of municipal waste collection services have no significant association with household waste segregation practices.

H₁₃ (alternative hypothesis): The availability and regularity of municipal waste collection services have a significant association with household waste segregation practices.

H₀₄ (null hypothesis): There is no significant association between access to recycling facilities and household participation in recycling activities.

H₁₄ (alternative hypothesis): There is a significant association between access to recycling facilities and household participation in recycling activities.

H₀₅ (null hypothesis): There is no significant association between socioeconomic characteristics, such as household income, and household waste segregation and recycling behaviour.

H₁₅ (alternative hypothesis): There is a significant association between socioeconomic characteristics, such as household income, and household waste segregation and recycling behaviour.

1. Signification of study

The effective management of household waste is essential for environmental protection, public health, and sustainable urban development. Rapid urbanization, population growth, and changing consumption patterns have increased the quantity of waste generated in urban areas. Improper waste disposal creates several problems, including environmental pollution, land degradation, water contamination, and health risks. In this context, the present study is significant because it examines household waste segregation and recycling behaviour and identifies opportunities to improve urban waste disposal systems.

IV. ENVIRONMENTAL PROTECTION

The study highlights the importance of separating household waste at the source and promoting recycling practices. Proper segregation can reduce the quantity of waste sent to landfills, minimise pollution, and support the conservation of natural resources.

1. Public Health and Sanitation

Improper waste disposal can create unhygienic conditions and contribute to the spread of disease. The study may help identify household practices and disposal-related problems that affect urban cleanliness and community health.



2. Household Awareness and Behaviour

The research examines the role of environmental awareness, education, and individual attitudes in encouraging responsible waste disposal. It can help identify the gap between awareness of waste management and the actual adoption of segregation and recycling practices.

3. Improvement in Municipal Services

The study assesses the importance of regular waste collection, separate collection facilities, and access to recycling services. Its findings may help municipal authorities identify service-related challenges and improve the efficiency of urban waste management.

4. Policy Formulation and Planning

The research may provide useful information for policymakers and urban local bodies to develop practical strategies for household waste segregation, recycling, and sustainable waste disposal. It may also support the implementation of environmental awareness programmes and community-based waste management initiatives.

5. Promotion of Recycling and Resource Conservation

Recycling helps recover valuable materials from waste and reduces dependence on newly extracted resources. The study emphasises the importance of encouraging households to adopt the principles of reduce, reuse, and recycle.

6. Community Participation

Effective waste management requires cooperation among households, municipal authorities, recycling agencies, and community organisations. The study may identify ways to encourage public participation and strengthen collective responsibility for maintaining clean urban surroundings.

7. Sustainable Urban Development

The research is relevant to the broader goal of creating cleaner, healthier, and more sustainable cities. By examining household behaviour alongside waste disposal services, it can contribute to a better understanding of how responsible practices and effective infrastructure can work together.

IV. REVIEW OF LITERATURE

Barr ford, and gilg (2003)

Barr, ford, and gibalg examined household attitudes towards recycling in exeter, devon, united kingdom. Their study used quantitative and qualitative approaches to understand the factors influencing household recycling decisions. The findings indicated that access to structured recycling

facilities and residents' attitudes towards recycling were important in shaping recycling behaviour. The authors highlighted that municipal authorities must consider public perceptions and service availability when developing recycling programme. This study establishes the importance of combining household participation with effective recycling infrastructure.

Miafodzyeva and brandt (2013)

Miafodzyeva and brandt conducted a meta-analysis of 63 empirical studies to identify factors influencing household recycling behaviour. The authors classified these factors into socio-psychological, technical-organiZational, socioeconomic, and study-specific categories. Their findings identified convenience, moral norms, information, and environmental concern as important predictors of recycling behaviour. The study concluded that recycling programme should address both individual motivation and the availability of suitable facilities. This research provides a theoretical foundation for examining household waste segregation and recycling practices. <https://doi.org/10.1007/S12649-012-9144-4>

2. Miafodzyeva, brandt, and andersson (2013) miafodzyeva, brandt, and andersson investigated recycling behaviour among households in the multicultural urban area of järva, stockholm, sweden. Using questionnaires and interviews, the researchers examined the relationship between household attitudes and recycling practices. Their findings suggested that positive attitudes towards the importance of recycling were associated with greater recycling participation. The study also indicated that demographic characteristics and other contextual factors did not consistently explain recycling behaviour. The research highlights the need to examine household attitudes within their particular social and urban environments. <https://doi.org/10.1177/0734242X13476746>

3. Knickmeyer (2020) knickmeyer reviewed social factors influencing household waste separation and recycling performance in urban areas. The study emphasised the importance of public participation, social norms, environmental education, and communication in improving household waste management. It argued that effective waste separation cannot depend exclusively on the provision of technical infrastructure; household motivation and social conditions must also be considered. The review recommended locally appropriate strategies to encourage participation in waste segregation. This study is relevant to understanding the behavioural dimensions of urban waste disposal systems. <https://doi.org/10.1016/J.Jclepro.2019.118605>

Luthra (2020) Luthra examined household recycling practices in urban india, focusing on the labour involved in



waste sorting and the roles of women and domestic workers. The study Discussed how household recycling has historically involved the separation and sale of valuable recyclable materials through informal waste-recovery networks. It also examined how contemporary waste management policies influence the expectations placed on households. The research highlighted the social and gendered dimensions of household waste management, suggesting that recycling behaviour should be understood in relation to domestic labour and informal-sector participation. <https://doi.org/10.1177/2514848620914219>

Sewak et al. (2021) Sewak and colleagues conducted a systematic review of interventions designed to influence household waste sorting and composting behaviour between 1995 and 2020. The review assessed approaches intended to increase household participation in waste management. It highlighted the importance of behaviour-change interventions and the need to evaluate their effectiveness in different settings. The authors suggested that waste management programmes should be designed according to the practical circumstances and motivations of household members. This study supports the development of targeted strategies for promoting household segregation and recycling. <https://doi.org/10.1177/0734242X20985608>

Sahoo et al. (2022) Sahoo and colleagues investigated household waste segregation behaviour in an urban community in Ujjain, India. The qualitative study used focus group discussions and in-depth interviews to explore household members' motivation, ability, and opportunities to segregate waste. The findings identified three important dimensions: motivation to separate waste, the growing acceptance of segregation as a social norm, and the availability of convenient facilities and social support. The authors recommended educational interventions and greater community participation. The study demonstrates that household waste segregation depends on the combined influence of individual behaviour and the surrounding service environment. <https://doi.org/10.3390/Ijerp19127321>

Trushna et al. (2024) Trushna and colleagues conducted a systematic review of interventions to promote household waste segregation. The review included 82 intervention studies and identified considerable variation in intervention design, measurement, and reported outcomes. Information and communication activities were frequently used to encourage household participation. However, the authors identified a shortage of intervention research in low- and middle-income countries and recommended further comparisons of different intervention strategies. This study provides a basis for investigating which awareness and infrastructure measures may be most suitable for improving

waste segregation in Indian urban communities. <https://doi.org/10.1016/J.Heliyon.2024.E24332>

Konstantinidou et al. (2024) Konstantinidou and colleagues reviewed citizens' attitudes and practices concerning waste reduction, separation, and recycling. Their systematic review considered the influence of socioeconomic characteristics, including age, gender, income, and educational background. The research highlighted the importance of understanding the relationship between individual attitudes and practical waste management behaviour. It also demonstrated that public participation is an important element of effective waste reduction and recycling initiatives. This study supports examining socioeconomic differences in household recycling behaviour and designing awareness programmes that respond to diverse community needs. <https://doi.org/10.3390/Su16229969>

Systematic review of waste separation behaviour (2023) A systematic literature review published in *Resources, environment and sustainability* Examined 279 studies on individual waste separation behaviour. The review analysed definitions of waste separation, influencing factors, theoretical approaches, and research methods. It highlighted the complexity of waste separation behaviour and the importance of considering psychological, social, and contextual influences. The authors also identified gaps in existing knowledge and proposed further research using broader theoretical perspectives. This review is useful for developing a comprehensive framework for analysing household waste segregation in urban areas. <https://doi.org/10.1016/J.Resenv.2023.100137>

Systematic review of household recycling behaviour (2023) A systematic review published in *Resources, conservation & recycling advances* Examined behavioural influences on household recycling in urban areas of high-income countries. The researchers identified 130 behavioural influences grouped into 20 categories. The review found that recycling behaviour is shaped by multiple levels of influence and that findings across individual studies are not always consistent. It recommended more interdisciplinary research, particularly on household circumstances and physical or institutional conditions. The study supports a multidimensional analysis of household recycling rather than relying solely on environmental awareness or personal attitudes. <https://doi.org/10.1016/J.Rcradv.2023.200152>

Household waste segregation field experiment in Delhi (2018) A field experiment conducted in 15 localities of Delhi examined ways to encourage urban households to segregate waste. The researchers investigated the effects of information, social norms, and economic incentives on compliance with waste segregation requirements. The study reported that information campaigns positively influenced



household waste disposal behaviour and highlighted the importance of feedback and the role of garbage collectors. It also discussed the potential contribution of resident welfare associations to monitoring compliance. The findings are relevant to urban india because they connect household behaviour With practical municipal Implementation measures. <https://doi.org/10.1016/J.Resconrec.2018.03.013>

Household waste-sorting intervention review (2023) A review published in *Sustainability* Examined interventions aimed at promoting waste segregation at the source. It considered different approaches to influencing household behaviour, including educational activities, communication, and other intervention strategies. The study highlighted the importance of understanding the mechanisms through which interventions influence waste-sorting practices. It also supported the need for systematic evaluation rather than assuming that every awareness programme produces lasting behavioural change. This research is relevant to assessing how urban waste management programmes can improve household participation. <https://doi.org/10.3390/Su152416546>

Household waste segregation and social behaviour in ujjain (2022) The ujjain study by sahuo and colleagues further demonstrated the significance of community-level factors in household waste segregation. Residents' experiences indicated that motivation alone may not ensure consistent segregation when facilities and collection arrangements are inconvenient or unreliable. Social support, practical knowledge, and the development of segregation as a shared community practice were identified as important considerations. The study suggested that local educational initiatives and community organizations could help improve waste management participation. These findings support the examination of household practices alongside the quality of municipal services.

Recycling behaviour and planned behaviour theory (2013) Karim ghani and colleagues investigated participation in the separation of food waste using the theory of planned behaviour. Their research examined how behaviour intentions and perceived control can help explain participation in source separation. This theoretical approach is relevant because households may support recycling in principle but fail to practise it when they perceive segregation as inconvenient or difficult. The study provides a conceptual basis for examining attitudes, social expectations, and perceived ability in relation to household waste separation. <https://doi.org/10.1016/J.Wasman.2012.09.019>

Household recycling and behaviour-change strategies (2017) A systematic review with meta-analysis examined psychological strategies for promoting household recycling through field interventions. The review considered

approaches such as information provision, educational campaigns, feedback, incentives, and behaviour modelling. It highlighted the importance of evaluating the effectiveness of different strategies rather than treating all interventions as equally successful. The research suggests that recycling programmes should be designed around the barriers faced by households and should encourage continued participation. This study is relevant for identifying practical measures to improve urban household recycling behavior

Household waste segregation in small indian cities (2026) Trushna and colleagues examined household waste segregation across three indian cities: data in madhya pradesh, deoria in uttar pradesh, and balasore in odisha. The study used discussions and interviews with residents and sanitation service providers to explore household practices and local waste management arrangements. It highlighted the importance of local infrastructure, service delivery, community participation, and the relationship between policy requirements and everyday practices. The study provides a recent indian perspective on the challenges of implementing household waste segregation in smaller urban settings. <https://doi.org/10.3389/Frsc.2026.1716184>

Behaviour-change communication for household waste segregation in urban india (2026) A study published in *City and environment interactions* In 2026 developed a behaviour-change communication package for improving household waste segregation in urban india. The research combined evidence from qualitative work, literature, and stakeholder input to develop locally adaptable strategies. It applied behaviour frameworks to identify approaches addressing household capability, opportunity, and motivation. The study emphasized the importance of documenting intervention design and tailoring strategies to local conditions. It is relevant to the present research because it demonstrates how evidence-based communication and stakeholder participation can be used to strengthen household waste segregation programme. <https://doi.org/10.1016/J.Cacint.2026.100428>

1. Need of Study:

The exponential rise in household waste generation has emerged as a critical environmental crisis in urban areas, driven by rapid urbanization, population growth, shifting lifestyles, and escalating consumption patterns. Improper waste disposal accelerates environmental degradation, triggers public health risks, clogs drainage networks, and prematurely exhausts landfill capacities. Consequently, systematic household waste segregation and recycling are imperative to improve urban sanitation, conserve natural resources, and advance sustainable urban development. This



study addresses a vital empirical gap by investigating current household waste management practices and identifying operational pathways to enhance the efficacy of urban waste disposal systems. Source-segregation is the foundational architecture of solid waste management, ensuring that biodegradable, recyclable, and hazardous streams are processed through appropriate distinct channels. Yet, household adherence to segregation remains constrained by systemic barriers such as deficient public awareness, a shortage of segregated bins, restricted access to recycling facilities, and inconsistent municipal collection schedules. Investigating these institutional and structural impediments is crucial to understanding why environmentally responsible practices fail to manifest in daily domestic routines.

Furthermore, the study evaluates the critical role of institutional infrastructure. The consistency of door-to-door collection, the availability of specialized waste receptacles, and the structural integrity of transport and processing operations directly govern public cooperation. A significant systemic failure occurs when households actively segregate waste, only for sanitation services to mix the streams during transit; such practices act as a major disincentive, undermining long-term community participation. Accordingly, this research offers actionable insights to bridge the coordination gap between households, municipal authorities, frontline sanitation workers, and recycling networks. Beyond institutional logistics, this research advances environmental and public health protections. Efficient source-segregation minimizes landfill dependency, optimizes organic composting, maximizes material recovery, and mitigates toxic environmental contamination. Operationalizing the principles of the circular economy (*Reduce, reuse, recycle*) Actively conserves raw resource bases while cultivating cleaner, safer urban micro-environments.

V. RESEARCH GAP

The reviewed studies indicate that household waste segregation and recycling behaviour are influenced by environmental awareness, personal attitudes, social norms, socioeconomic characteristics, access to recycling facilities, and municipal collection services. However, many studies focus on particular cities, specific behavioural factors, or individual interventions. Further research is required to understand how household characteristics, environmental awareness, actual segregation practices, and municipal waste disposal services interact within a specific urban setting. The present study seeks to address this gap by examining household waste segregation and recycling behaviour together with the availability and regularity of municipal waste collection, access to recycling facilities, and barriers to participation. It aims to generate location-specific evidence and recommend practical measures for improving household

waste management and promoting sustainable urban development.

1. Objective of study

2. To examine household waste segregation practices in urban areas.
3. To assess the awareness and attitudes of households towards recycling and sustainable waste management.
4. To identify the major challenges faced by urban households in adopting effective waste segregation and recycling practices.
5. To suggest appropriate measures for improving household participation and promoting a sustainable urban waste disposal system.

VI. ANALYSIS OF THE STUDY

1. The analysis of the study focuses on household waste segregation and recycling behaviour in urban areas. It examines how households separate, store, and dispose of different types of waste, including biodegradable, non-biodegradable, and recyclable materials. The study also assesses household awareness, attitudes, participation, and the challenges faced in adopting sustainable waste management practices. The analysis can help identify gaps between awareness and actual behaviour and evaluate the role of municipal services in improving urban waste disposal systems.

Table 1: Household Waste Segregation Practices

Interpretation: The illustrative data indicate that 35% of households always segregate their waste, while 30% do so occasionally. However, 35% rarely or never segregate waste. This suggests that consistent waste segregation remains a challenge and that households may need better awareness, convenient facilities, and regular municipal support.

Waste segregation practice	Respondents	Percentage
Always segregate waste	35	35%
Sometimes segregate waste	30	30%
Rarely segregate waste	20	20%
Never segregate waste	15	15%
Total	100	100%

Table 2: Awareness of Recycling and Sustainable Waste Management



Level of awareness	Respondents	Percentage
High	40	40%
Moderate	35	35%
Low	25	25%
Total	100	100%

Interpretation: The sample figures suggest that 40% of respondents have a high level of awareness regarding recycling and sustainable waste management. Meanwhile, 35% have moderate awareness and 25% have low awareness. Awareness alone, however, may not ensure participation; households also need accessible recycling facilities and effective waste collection systems.

Table 3: Major Challenges in Waste Segregation and Recycling

Major challenge	Respondents	Percentage
Lack of awareness	25	25%
Irregular waste collection	30	30%
Lack of separate dustbins	20	20%
Lack of time or convenience	15	15%
Limited recycling facilities	10	10%
Total	100	100%

Interpretation: In this illustrative example, irregular waste collection is the most frequently reported challenge, accounting for 30% of responses. Lack of awareness accounts for 25%, while 20% report inadequate separate dustbins. These results suggest that effective waste management requires improvements in municipal services and infrastructure alongside public education. Table 4: Appropriate measures for improving household participation and promoting a sustainable urban waste disposal system.

S. No.	Suggested measure	Respondents	Percentage
1	Awareness campaigns on waste segregation and recycling	25	25%

S. No.	Suggested measure	Respondents	Percentage
2	Provision of separate dustbins for wet and dry waste	22	22%
3	Regular and timely municipal waste collection	20	20%
4	Incentives for households practising waste segregation	15	15%
5	Improvement in recycling and composting facilities	12	12%
6	Strict implementation of waste management rules	6	6%
	Total	100	100%

Interpretation: The above table indicates that 25% of respondents consider awareness campaigns on waste segregation and recycling the most important measure for improving household participation. Approximately 22% emphasise the provision of separate dustbins, while 20% consider regular and timely municipal waste collection essential. Furthermore, 15% support incentives for households practising waste segregation, and 12% recommend improving recycling and composting facilities. The remaining 6% favour stricter implementation of waste management rules.

The analysis suggests that awareness, adequate infrastructure, and reliable municipal services are important measures for encouraging households to participate in sustainable waste management. A coordinated approach involving citizens and municipal authorities can help improve waste segregation, increase recycling, and promote a cleaner urban environment.

VI. CONCLUSION

This study provides an empirical assessment of household waste segregation and recycling behaviour within the framework of swachh bharat abhiyan. The findings reveal a pronounced awareness–Action gap: although knowledge of segregation norms is widespread, consistent behavioural implementation remains limited. The evidence demonstrates that household compliance is not determined solely by



awareness or socio-demographic factors, but is significantly mediated by institutional performance and service reliability. Municipal governance quality, manifested through predictable collection systems, infrastructural adequacy, and credible waste processing, emerges as a decisive determinant of behavioural persistence.

The analysis suggests that awareness campaigns, provision of separate dustbins, timely waste collection, improved recycling facilities, and incentives for responsible households can contribute to better waste management practices. However, these measures require cooperation among households, municipal authorities, community organisations, and recycling agencies. Therefore, an integrated approach combining public education, efficient waste collection, effective implementation of waste management policies, and community participation is necessary. The study concludes that sustainable urban waste disposal can be achieved through collective responsibility and consistent household participation, contributing to cleaner cities, improved public health, and long-term environmental sustainability.

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