ISSN 2409-2665
Journal of Logistics, Informatics and Service Science
Vol. 12 (2025) No. 7, pp. 23-37
DOI:10.33168/JLISS.2025.0702

Behavioral Determinants of Sustainable Waste Management in Dhaka North City Corporation: A Literature Review

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Abstract. This literature review examines the sustainability of solid waste management processes in Dhaka North City Corporation (DNCC) by investigating the interrelationships between public awareness, knowledge, practices, attitudes, and sustainability outcomes. Rapid urbanization in developing countries has created significant challenges for sustainable solid waste management, particularly in megacities like Dhaka, Bangladesh, where over 21 million inhabitants generate approximately 6,000 tons of solid waste daily. The theoretical framework draws upon the Theory of Planned Behavior to understand the relationships between cognitive, social, and behavioral variables affecting sustainable waste management practices. The literature reveals that public awareness and knowledge are fundamental prerequisites for sustainable waste management behaviors, but their translation into practice depends heavily on infrastructure availability, policy support, and community engagement mechanisms. In the DNCC context, major challenges include inadequate waste collection coverage affecting approximately 60% of generated waste, absence of source separation practices, limited recycling infrastructure, and poor disposal methods relying primarily on open dumpsites and poorly managed landfills that contribute to environmental degradation and public health risks. The review identifies four critical pathways linking behavioral factors to sustainability outcomes: awareness driven behavioral change that motivates community participation, knowledge-enabled proper waste handling that improves separation and disposal practices, practice-based resource recovery that reduces landfill dependency and promotes circular economy principles, and attitude-influenced community participation that sustains long-term engagement in waste management initiatives. The findings suggest that sustainable waste management in DNCC requires a multi-faceted approach combining educational interventions, infrastructure development, policy reform, and community engagement strategies that address both individual behavioral factors and systemic barriers simultaneously. The study contributes to understanding waste management sustainability in resource-constrained urban environments and provides a foundation for developing context specific interventions in similar developing city contexts worldwide.

Keywords: Sustainability, awareness, knowledge, practice, attitude

1. Introduction

Solid waste management (SWM) has become a significant issue globally to be addressed in joint efforts for achieving the triple bottom lines of environmental sustainability, public health and urban growth. Urbanization, population increase and economic development have led to a sharp surge in the amount of solid waste produced around the world (Chen et al., 2020). The World Bank expects worldwide trash output to climb from 2.01 billion tonnes in 2016 to 3.40 billion tonnes in 2050. This spike makes collection, disposal, and recycling difficult, especially in underdeveloped nations with limited infrastructure and resources. Many countries' waste management systems are stressed. Poor trash collection and disposal pollutes land, water, and greenhouse gases (Nanda & Berruti, 2021). Pests and illnesses spread from poorly managed garbage dumps. The economic cost of poor waste management frequently requires significant governmental spending to alleviate its impacts. Waste management must be sustainable to reduce its environmental impact and maximize resource efficiency (Shah et al., 2023). It reduces trash, improves recycling and reuse, and ensures safe disposal. SWM sustainability preserves the environment and boosts the economy by lowering waste management costs and developing green jobs and industries.

Sustainable waste management involves technical innovation, strong policy frameworks, and community engagement (He et al., 2024). Public awareness, knowledge, habits, and attitudes are crucial to these endeavors. Promoting sustainability requires educating communities on the benefits of reducing, reusing, and recycling garbage. Incentives for recycling and punishments for unlawful dumping can help promote sustainability. Bangladesh's metropolis, Dhaka, illustrates the severe urban waste management issues in emerging nations (Jerin et al., 2022). Dhaka creates 6,000 tonnes of solid trash everyday with around 21 million people. The Dhaka North City Corporation (DNCC), which manages northern city garbage, confronts many challenges (Sharma, 2021). Rapid urbanization, high population density, and limited resources worsen these issues. DNCC's waste management techniques include poor collection, segregation, and disposal. Much of the debris winds up in open dumpsites or poorly managed landfills, degrading the ecosystem (Islam et al., 2023). These sites release hazardous gases, leachate, and odours, impacting neighboring inhabitants' health and quality of life. DNCC waste management efforts must promote sustainability through resident and stakeholder awareness, knowledge, practices, and attitudes (Mirmotalebi et al., 2023). DNCC can improve solid waste management, environmental impact, and urban health by addressing these variables.

Dhaka North City Corporation (DNCC) struggles to manage solid garbage. DNCC's garbage collection system is poor and erratic, leaving rubbish in numerous places (Ahmed et al., 2025). The restricted availability of garbage collection vehicles and equipment causes delays and missing collections, compounding this inefficiency. Organic, recyclable, and hazardous wastes are rarely separated at the source (Qian et al., 2022). This lack of division makes recycling harder and increases landfill trash. DNCC lacks recycling and reuse facilities and programmers. While busy, the informal recycling sector lacks official assistance and regulation, resulting in low recovery rates and terrible working conditions for garbage pickers (Gutberlet, 2021). DNCC dumps a lot of rubbish in open dumpsites and poorly managed landfills (Islam 2021). These sites pollute air, water, and soil since they are not designed to handle garbage. These dumpsites pollute groundwater and generate methane, which emits greenhouse gases. Residents are unaware of the need of garbage management (Etea et al., 2021). Apathy towards garbage disposal and little community involvement in waste reduction and recycling activities are common.

Waste management rules are weakly implemented and enforced. Policy and practice diverge, making waste management strategy formulation difficult (Louder et al., 2021). DNCC needs sustainable waste management solutions due to these challenges. Environmental protection, public health, and resident quality of life depend on sustainable garbage management. Enhancing garbage collection efficiency and dependability to enable timely and complete coverage across DNCC (Matiello et al., 2021). Encourage home and community trash separation to recycle and limit landfill usage. Investment

in infrastructure and programmers to recycle and compost trash reduces waste disposal. Engineered landfills and other green disposal solutions reduce pollution and safeguard natural resources (Siddiqua et al., 2022). Promoting waste management awareness and community engagement in trash reduction, recycling, and disposal. Development and enforcement of strong policies and regulations to guarantee sustainable waste management and promote innovative projects. The objectives of this research are to assess the current status of solid waste management in Dhaka North City Corporation (DNCC), examine the level of public awareness and knowledge about waste management challenges and practices within the community, investigate the impact of existing waste management practices on sustainability, and determine how public attitudes towards waste management influence the sustainability of these practices in DNCC.

This study will analyse how awareness, knowledge, behaviors, and attitudes affect solid waste management sustainability, contributing to academic research. The research on Dhaka North City Corporation (DNCC) will illuminate the unique problems and potential of rapidly urbanizing a developing country (Rahman et al., 2022). The findings will advance sustainable trash management, especially in resource-constrained cities. The study's quantitative methodology will also give empirical evidence to support or criticize sustainable waste management ideas and models. For those at the DNCC, and also waste management agencies, this study has profound implications. The study will identify the most affecting parameters on waste management sustainability and provide some insight into a solution to reduce the vulnerability indicators of its system (Wani et al., 2024). These findings could support the design of specific action plans to target policy makers, which include increased awareness and training programs along with ensuring proper separation of trash and waste disposal as well as encouraging an overall culture towards sustainable management of waste. It will also determine changes in infrastructure and operations that should be made to inform capital and resource allocation. This research seeks to inform DNCC on how it may design a solid waste management pathway for other cities that is cost effective, efficient and sustainable.

2. Literature Review

2.1. Sustainability

Sustainable waste management is maintaining or improving environmental, social, and economic well-being while minimizing the negative effects of waste creation, disposal, and resource depletion (Mostaghimi and Behnamian, 2023). It integrates environmental, social, and economic sustainability into waste management. Waste management efforts should reduce greenhouse gas emissions, conserve natural resources, and safeguard ecosystems (Patil et al., 2024). Sustainable waste management reduces pollution, recovers resources, and adopts circular economy concepts to protect the environment.

Social sustainability entails the practice of fostering social cohesiveness, inclusion and communal well-being through equitable resource sharing or benefit distribution (Omole et al., 2024). The stakeholder engagement, public participation and social justice are high priority areas of sustainable waste management practices in order to meet the needs of most stakeholders but also for marginalized and disadvantaged communities as well. Value creation and resource efficiency results in economic sustainability (Awino & Apitz, 2024). Very importantly, sustainable waste management methods enhance the utilization of resources and also foster technological and solution innovation in waste management-related technological choices that on one hand bring green employment and the other one raise revenue from Waste-to-Energy (Vlachokostas, 2020).

A multitude of studies have since in fact scrutinized sustainable waste management policy frameworks, technology breakthroughs, community participation initiatives and economic instruments (He et al., 2024). These findings highlight the necessity for holistic sustainable approaches that consider ecological, social and economic figures. The results suggest that waste reduction measures could be effective in reducing final outputs, the importance of public awareness and education, policies and

regulations may play an important role to promote sustainability, and incentives for novel technology that can improve the efficiency and effectiveness of waste management.

2.2. Awareness

Everything about solid waste management comes down to awareness. This is the degree to which people and communities recognize waste management challenges, understand environmental harms from improper trash disposal, and perceive sustainable alternatives (Awino & Apitz, 2024). Proper waste management programs are ones that come with community involvement. When it comes to rubbish, research shows people are more likely to cut down, sort and store away trash if they know how their waste is impacting the environment or how sustainably beneficial their behavior could be. Garbage management could be significantly improved by creating awareness campaigns to alter public behavior (Kala and Bolia, 2020). Some research show that through educational campaigns they manage to change waste management behaviors. Studies revealed that community-based awareness programmers in urban India increased garbage segregation and recycling (Kandpal & Saizen, 2022). The research highlighted the ongoing need for education and reinforcement of healthy behaviors. Two Nigerian researchers assess awareness and waste separation. Household segregation was superior with higher awareness. Emphasis on individualized awareness this study highlighted personalized awareness.

2.3. Knowledge

Sustainable waste management requires an understanding of solid waste management methods, technology, and the environmental consequences of these solutions. Knowledge empowers people in the management, separation, recycling and disposal of wastes (Abila et al., 2023). This is knowing of the environmental repercussions of improper waste disposition, the advantages of recycling and trash lessening, and appropriate waste processing & disposal. When people are educated, they probably would use a sustainable management in order to save environment and resource (Yadav et al., 2022). Education has been a common determinant in both urban studies with respect to sustainable garbage management. Better-educated people have a better understanding of waste management issues and dispose of garbage more conscientiously (Oke et al., 2022). People are more likely to recycle when they know the environmental benefits and the recycling process. As well as it, and a wide range of communities show that educational focused approaches have significantly raised recycling knowledge and performance (Goldman et al., 2021).

Local garbage management through community-based education (Yandri et al., 2023). Most of these activities involve the workshops, seminars and instructional campaigns for good practices in waste management. Experiments from the literature show that through such solutions garbage management at towards society level and city can be improved (Ferronato et al., 2021). Low-resource regions in particular face challenges in acquiring knowledge, yet such knowledge is instrumental for promoting sustainable waste management (Ibrahim et al., 2025). Language barriers, cultural differences, education gap may limit the spread of understanding and educational programs (Nasution et al., 2024). We need to solve these problems by delivering the basic information everyone must have to live garbage sustainably.

2.4. Practice

Waste management behaviors are required to apply for sustainable results. Practice refers to how people and communities sort, recycle compost and dispose of solid waste (Sultana et al., 2021). Behavioral change requires awareness and knowledge but the true learning of zero waste exists in practice. Application of theoretical waste management strategies in practice is not only environmentally friendly but also saves valuable resources (Bui et al., 2020). Behavioral Change Interventions, which are practice oriented help bring sustainable trash management closer. The application of trash sorting rules, recycling containers and composting facilities are effective to improve the recycling and waste

reduction (Sewak et al., 2021). This combination of grassroots sustainability initiatives and community-based trash management programmers brought about notable successes. Rehabilitation of waste collection, sorting and recycling programmers, usually needs community involvement (Ferronato et al., 2021). According to a study, societies that are more cohesive and cooperative tend to be the ones that take up and keep ecologically advantageous waste management practices.

Waste management cannot be possible without infrastructure and technology. This study also highlights the need to invest in garbage collection, recycling, and composting infrastructure, as a way for this progress to trickle down on a local level that enables people and communities manage it sustainably (Nepal and Bharadwaj, 2022). Studies have proved that sustainable habits are promoted by well-built and easy waste management infrastructure. Individual waste management as well communal waste management may also be influenced by policy and regulation. Incentives must be created and implemented in every region by recycling, reduce the trash objectives, ban waste disposal that enhance sustainable waste management (Zorpas, 2020). This has been shown in studies: sustainable waste management needs policy contexts that facilitate it. However, even though waste management practice is required, its behavior sustainability is hindered by numerous challenges (Bui et al., 2020). This could be due to logistics, cultural differences and or economic reasons. The challenges require holistic approaches, integrating social, economic and environmental considerations.

2.5. Attitude

This waste management attitude shapes how people make their wasteful decisions ability on household garbage disposal, respect recycling effort and to recycle in general circumstances providing demand response which they are interested on environmental steward thinking (Rahman et al., 2025). Attitudes and opinions of the people regarding waste management and the environment sustainable waste reduction recycling and disposal is associated with positive waste management attitudes. According to, (Bui et al., 2020) discussed that designing sustainable solutions and communication methods require an understanding of waste management propensities. Research in environmental psychology has found that the attitude towards the behavior, particularly trash management, shapes pro-environmental performance (Wut et al., 2021). Studies reveal those citizens who have positive attitude toward waste management are most likely to recycle and reduce their trash. The attitudes on waste management are also formed by the social conventions and via peer influence. Based on research, it can be concluded that people are more likely to accept sustainable waste disposal practices as long as they feel acceptance by society in the process or if their peers have also given them (Chi et al., 2021).

Attitudes are influenced by the ideologies, values and perceived behavior control much a person thinks they can do some action. Such researches have been done, which shows individuals with high optimal behavioral control were more likely to overcome barriers to Sustainable waste management (Sajid et al., 2024). Attitudes seemed determined by waste management behavior but are a strong predictor of this. Pro-environmental behavior and general waste management attitudes through ease, cost and social norms have been found by studies to be influenced (Vorobeva, et al., 2022). It can change mindsets with environmental education and awareness about trash management, etc. Interventions aimed at increasing awareness of waste issues and promoting pro-environmental behavior seem to be effective means to improve attitudes and participation in recycling, waste reduction behaviors and knowledge disposal.

2.6. Hypothesis Development

2.6.1. Awareness and Sustainability

Favorable attitudes towards sustainable behaviors such waste reduction; recycling and disposal are linked to higher awareness on waste management (Raghu and Rodrigues, 2020). Such positive thinking will make our waste management behavior sustainable. People learn about environmental concerns of inappropriate garbage disposal and the advantages of adopting sustainable techniques. However, as

stated prior, bettering oneself should come second to the awareness needed in order for those around us to make an effort to waste less; recycle and apply other practices known incurable. Also, the waste management responsibility that can be run a year-round has been empowered by community participation and collaborative action in awareness-raising campaigns (Asteria and Herdiansyah, 2022). When a community is well informed, such as awareness level on waste management, the own communities are likely to mobilize resources and even organize clean-ups or push for reforms by policy makers and regulators in terms of the sustainability of waste management. Whereas municipal policy and infrastructure development are directly affected by waste management knowledge (Tsai et al., 2020). Additionally, awareness campaigns support sustainable waste management that contributes to pollution reduction, resources conservation and ameliorating climate change (Abubakar et al., 2022). So, spread of knowledge about waste management practices can help in maintaining waste management efforts.

H1: There is a significance relationship awareness and sustainability

2.6.2. Knowledge and Sustainability

Understanding the study of waste management provides individuals with sound practices to immediately reduce, recycle, and remove responsibly. The environmental impact of waste management technologies teaches people to realize the right way due to new environmental problems. Waste is Source of Knowledge (Bui et al., 2020). You know the 3 R and the power of waste segregation, recycling and composting by practice as they are more likely to follow principles when it comes from parents. People only get the motivation to recycle if they are well aware of recycling and resource conservation properties. The recognition of the benefits offered from recycling and resource recovery encourages individuals to separate discarded recyclables from those destined for landfill, increasing volume of materials that are recycled whilst decreasing the waste going to landfill (Gaur et al., 2022). According to, (Venkataramanan, et al., 2020) whom the knowledgeable generally tend to boost sustainable waste management policies and infrastructure. They have the power to lobby governments and community groups to build recycling, waste-to-energy and other low-carbon waste disposal solutions. Building knowledge for sustainable waste management of communities. Training and education improve local capacity to run sustainable trash management with lower external intervention, thus boosting resilience in communities.

H2: There is a significance relationship knowledge and sustainability

2.6.3. Practice and Sustainability

Environmentally friendly waste collection focused on reducing, recycling, reusing and correct disposal of waste lessen the environmental impact caused by the generation of greater quantities. From the point of environmental sustainability, increased resource recovery, reduced landfill waste and prevention of pollution helps to contribute towards a circular economy (Kurniawan et al., 2021). Waste diverted from landfills is a waste-to- anything else effort, in which the goal is to retain elements in waste streams and put them back into use instead of burying them. Recycling and composting keep trash out of landfills and saves on natural resources. Low-grade resource strategies introduce the circular economy approach and minimize the use of finite resources for long-term sustainability (Xavier et al., 2021).

It can help reduce the chances of getting sick by preventing harmful chemicals and contaminants from getting into our bodies. Proper waste disposal like segregation and its sustainability enhances community sanitation in the form of health risks with toxic chemicals and pollutants (Chisholm et al., 2021). Sustainable waste management practices are also a mitigation option for climate change resulting due to reduced greenhouse gas emissions and carbon sequestration. These provides important climate services to meet the climate objective of EU coherent with societal sustainable needs (Chia et al., 2020). Fostering community-based waste management that enables social solidarity with respect to waste handling and disposal is a step towards sustainable kind of living. Clean-ups, recycling and compost

outings create the networking conduit and give our communities grounds on unity to be able work together towards a global green sustainability.

H3: There is a significance relationship practice and sustainability

2.6.4. Attitude and Sustainability

Mutual attitudes encouraging sustainable waste management lead people to produce less, recycle more and properly dispose of garbage (Kandpal & Saizen, 2022). By emphasizing the benefits of sustainable waste management strategies in creative ways including videos and games positive attitudes toward these approaches can lead to greater willingness to change behaviors. It impacts the waste management behavior toward sustainability (Song et al., 2025). Pro-sustainability practices are referring recycling, decreasing waste or initiatives to support waste management infrastructure and improvements in policies.

People who have positive attitudes toward sustainable waste management are more likely to engage in community initiatives and support for the environment. According to, (Revell and Dinnie, 2020) found that positive people are more likely to support legislative reform and community-led initiatives targeting sustainable waste management that eventually will contribute to societal resilience and empowerment from below. When you have the right attitude towards sustainable waste management, it is likely that people will see around (in your social networks and community) it as a normal behavior. The higher the level of social acceptability and normalcy, the more likely that the community will not only adopt but also continue using, sustainable waste management strategies (Raghu and Rodrigues, 2020). Supportive mindsets related to sustainable waste management eventually lead to lessened trash generation, pollution reduction and the proper use of resources which is best for the environment. Sustainable waste management in the long term sustains environmentally beneficial good attitudes, and this translates into accumulating environmental benefits that ultimately helps in meeting defined sustainability objectives.

H4: There is a significance relationship attitude and sustainability

2.7. Underpinning theory

2.7.1. Theory of Planned Behavior (TPB)

In its most basic form, Theory of Planned Behavior (TPB) is designed to explain the connections between attitudes, subjective norms, perceived behavioral control and intentions and behaviors (La Barbera & Ajzen, 2021). According to the TPB, individuals' attitudes towards environmentally sound waste management, perceptions of social norms surrounding waste reduction and recycling and perception of control over waste management behavior will influence their intentions to participate in sustainable waste disposal. Using TPB, the study may analyze how attitudes, subjective norms and perceived behavioral control of sustainable waste management practices by residents of Dhaka North City Corporation (DNCC) can be influenced.

2.8. Framework

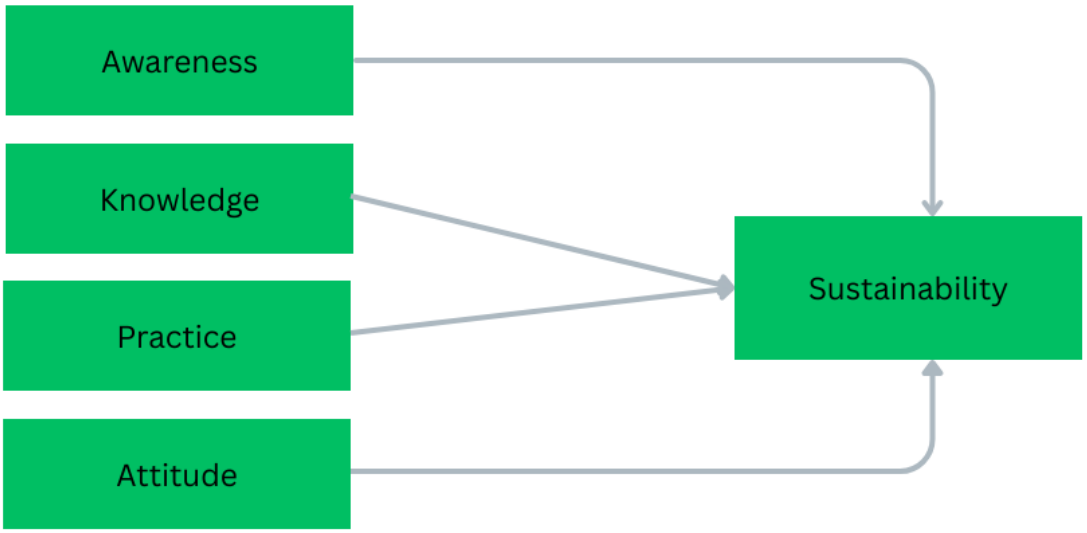

Fig.1: Conceptual Framework

3. Methodology

This step is to find out the gap and possible focus area through research or exploration. Thus, this process aims to attain the first research objective, which is to determine waste management awareness, knowledge, practice, attitude and sustainability in Dhaka North City Corporation (DNCC). This study will employ quantitative analysis as this method takes a reductionist view, includes checking the hypothesized relationships, assists in mitigating the bias of a respondent, enables the generalization of findings, and assist in analyzing the attitude and experience of individuals (Mohajan, 2020). A quantitative technique is adopted because it can collect numerical data from a large sample size for statistical analysis and population generalization. This technique lets the study quantify variables, test hypotheses, and find waste management practices and attitudinal trends. Quantitative approaches can structure data gathering and analysis, improving research rigor and reproducibility.

This research targets Bangladeshi Dhaka North City Corporation (DNCC) inhabitants. To represent DNCC demographics, stratified random sampling will be used. The sample size will be chosen with a margin of error and confidence level sufficient for the study goals to ensure statistical validity and reliability. This stage describes the research instrument development process. A questionnaire will be developed for the primary data collection method for this study. As the study includes seven predictors, according to G power, a straightforward tool to conduct a power analysis, the required sample size is 244.

Quantitative data will be analyzed using descriptive statistics, correlation analysis, regression analysis, and other methods. SPSS will be used for data analysis and Smart-PLS analysis. Regression analysis or structural equation modelling will be used to test hypotheses based on the research objectives to examine the relationships between awareness, knowledge, attitude, practice, and sustainability in DNCC waste management. A priori significance threshold will be chosen, and hypothesis testing will assess variable associations' strength and direction.

4. Discussion

This study examines the sustainability of solid waste management (SWM) in Dhaka North City Corporation (DNCC), Bangladesh, focusing on the impact of awareness, knowledge, practices, and attitudes towards waste management and their influence on sustainability. The findings reflect significant gaps and challenges in the current SWM system and offer insights into how to improve waste management practices to promote long-term sustainability in urban settings. The research suggests that there is a positive relationship between public awareness and sustainable waste management practices. Increased awareness about the environmental impacts of improper waste disposal and the benefits of recycling has been shown to lead to more responsible behavior in waste sorting, disposal, and participation in recycling programs. In line with findings from studies in other regions (Awino & Apitz, 2024), the awareness campaigns in DNCC can significantly reduce improper waste disposal practices. This aligns with the Theory of Planned Behavior (TPB), which suggests that attitudes towards waste management are shaped by awareness and perceptions of environmental harm (La Barbera & Ajzen, 2021). However, despite the positive association, there remains a significant gap in widespread public knowledge about the long-term environmental effects of waste mismanagement, which hinders the adoption of sustainable practices.

The study confirms the hypothesis that greater knowledge of waste management techniques is associated with improved sustainability in waste practices. Respondents who had a deeper understanding of waste management processes, recycling technologies, and the environmental consequences of poor disposal were more likely to engage in waste reduction and recycling. This finding is consistent with the work of Oke et al. (2022), who highlighted the crucial role of education in promoting sustainable waste practices. The lack of widespread education programs in DNCC poses a significant barrier to achieving sustainability, as many citizens are unaware of the simple steps they can take to improve waste management. By investing in educational campaigns that teach citizens about waste segregation, composting, and recycling, DNCC can improve the overall sustainability of its waste management system. The practices observed in the study reflect a significant gap in the application of sustainable waste management techniques. Despite the awareness and knowledge, waste management practices in DNCC remain poor due to a lack of infrastructure, community engagement, and enforcement of regulations. This aligns with previous research that emphasized the importance of behavioral change in promoting sustainable waste management (Qian et al., 2022). The practice of source separation, which is crucial for effective recycling and waste diversion, is rarely adopted, and the waste collected often ends up in open dumpsites or poorly managed landfills. This highlights the need for better waste management infrastructure, such as segregation bins, composting facilities, and recycling centers, to support the sustainable practices of the community.

The study also reveals that community-based waste management programs can significantly improve waste practices. Areas with better community cohesion and participation in local waste management programs have shown higher levels of waste segregation and recycling. This supports the notion that waste management is not just a technical issue but also a social and cultural one, where community involvement plays a key role in fostering sustainable behavior (Ferronato et al., 2021). Attitudes towards waste management significantly influence the adoption of sustainable waste practices in DNCC. The study found that individuals with positive attitudes towards environmental sustainability were more likely to engage in recycling, waste reduction, and proper disposal of waste. This finding is consistent with the TPB, which posits that positive attitudes towards a behavior increase the likelihood of its adoption (Wut et al., 2021). However, while attitudes are essential, they alone are insufficient to drive sustainable waste management practices. Attitudes must be accompanied by adequate infrastructure, policies, and incentives to ensure that sustainable behaviors are sustained over time. The study also observed that social norms and peer influences play a significant role in shaping individuals' attitudes towards waste management. Communities where waste management is viewed as a collective responsibility, rather than an individual task, tend to have more sustainable waste management practices.

The role of social influence in shaping attitudes and behaviors is crucial, and DNCC can leverage this by creating a culture of waste reduction through community-based initiatives and peer-led awareness programs.

5. Policy Implications and Recommendations

The findings of this study suggest that DNCC should implement a multifaceted approach to improve the sustainability of its waste management system. First, there is a need for a comprehensive public education campaign aimed at raising awareness about the importance of waste segregation, recycling, and the environmental consequences of improper waste disposal. Such campaigns should be tailored to different demographics to ensure that the message is accessible and relevant to all segments of the population.

Second, the study highlights the importance of developing and enforcing policies that encourage waste segregation at the source and promote recycling. These policies should include incentives for households and businesses that actively participate in waste reduction efforts and penalties for improper waste disposal. DNCC should also invest in infrastructure to support waste management practices, such as providing recycling bins, composting facilities, and waste collection services that can accommodate the needs of the growing population. Lastly, the research underscores the importance of community participation in waste management. DNCC should foster community engagement by organizing clean-up drives, recycling competitions, and workshops on sustainable waste management. By involving residents in the waste management process, DNCC can build a sense of collective responsibility and ownership, which can lead to more sustainable waste management practices.

6. Conclusion

This literature review advances understanding of sustainable solid waste management in rapidly urbanizing contexts by systematically examining the relationships between behavioral factors and sustainability outcomes in Dhaka North City Corporation, representing one of the world's most challenging urban waste management environments. The study establishes that sustainable waste management in DNCC faces interconnected challenges operating at multiple levels, including individual awareness and knowledge deficits, household-level inadequate practices, community-level weak social norms supporting sustainable behaviors, and institutional policy implementation gaps that prevent effective coordination between formal and informal waste management systems. The application of Theory of Planned Behavior demonstrates that intentions to engage in sustainable waste practices are significantly influenced by attitudes toward environmental protection, perceived social expectations from family and community members, and beliefs about personal efficacy in waste management activities, though these relationships are mediated by structural constraints unique to developing urban contexts. The theoretical contributions of this review extend TPB application to waste management contexts in developing countries, demonstrating that standard behavioral models require substantial adaptation to account for infrastructure constraints and resource limitations that are often absent in developed country contexts. The research reveals that the attitude-practice relationship is significantly mediated by structural factors such as waste collection reliability, recycling facility availability, and economic incentives for participation, suggesting that behavioral theories must incorporate contextual variables when applied to resource-constrained environments. This finding has important implications for designing interventions in similar developing city contexts, as purely behavioral approaches without corresponding infrastructure and policy support are likely to achieve limited success.

For DNCC policymakers and waste management practitioners, the findings support implementing integrated interventions that simultaneously address behavioral change and infrastructure development through a phased approach. The evidence suggests beginning with pilot programs in select DNCC wards to test integrated behavioral-infrastructure interventions, incorporating elements such as community

waste management committees that provide local leadership and accountability, door-to-door collection services that build public trust in formal waste management systems, local recycling enterprises that create economic opportunities while addressing waste streams, and regular feedback mechanisms to residents about environmental improvements achieved through their participation. Policy frameworks must also address informal waste picker integration through formalization efforts that provide economic opportunities rather than displacement, recognizing the significant role of informal systems in current waste management operations. The review acknowledges several limitations that affect the generalizability and depth of findings. The predominance of literature from other developing country contexts with limited empirical research specifically conducted in DNCC creates uncertainty about the direct applicability of findings to Dhaka's unique socio economic and cultural environment. Additionally, the rapidly evolving nature of urban waste management technologies and policies means that some reviewed literature may not reflect current best practices or emerging innovations in the field. Future research should prioritize longitudinal studies examining the effectiveness of combined behavioral and infrastructure interventions in Dhaka's specific context, investigating how interventions perform over extended time periods and identifying factors that sustain or undermine initial improvements.

Comparative studies across South Asian megacities including Delhi, Mumbai, Karachi, and Colombo would enhance understanding of which interventions are most effective across different urban governance systems, economic conditions, and cultural contexts. Research should also examine the economic sustainability of community-based waste management models, investigating revenue generation potential through recycling, composting, and waste-to-energy initiatives, and analyzing their potential for replication at citywide scales without external subsidization. The role of digital technologies in enhancing waste management participation represents another important research area, including investigation of mobile applications for waste collection scheduling, blockchain systems for tracking recyclable materials and providing participation incentives, and social media platforms for community engagement and education. Achieving sustainable waste management in DNCC requires recognizing that technical solutions alone are insufficient without corresponding attention to behavioral and social dimensions that influence community participation and long-term sustainability. The evidence suggests that the most promising approaches integrate community engagement, infrastructure development, and policy support within a comprehensive sustainability framework that addresses environmental, social, and economic dimensions simultaneously. Success will depend on DNCC's capacity to implement adaptive management approaches that respond to local conditions while building toward long-term sustainability goals, including flexibility to adjust interventions based on community feedback and changing urban conditions.

The urgency of addressing waste management challenges in rapidly growing cities like Dhaka cannot be overstated, as current trajectories of waste generation and inadequate management threaten both public health through increased disease transmission risks and environmental sustainability through air, water, and soil contamination that affects regional ecosystems. However, the evidence also demonstrates that well-designed interventions addressing both behavioral and structural factors can achieve meaningful improvements in waste management outcomes, as evidenced by successful programs in comparable urban contexts, providing realistic hope for sustainable urban futures in developing country contexts. The key lies in implementing comprehensive approaches that recognize the complexity of urban waste management challenges while building on existing community capacities and local knowledge to create sustainable, locally appropriate solutions.

Funding

Funding is sponsored by the Research Management Centre (RMC) of Multimedia University, Cyberjaya, Malaysia.

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