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A REVIEW OF SOLID WASTE MANAGEMENT PRACTICE IN MIRPUR, DHAKA NORTH CITY CORPORATION, BANGLADESH

Md. Habibullah Hadiuzzaman[1], Farjana Islam[2] and Md. Monowar Islam[3]

[1,2]Lecturer, Daffodil International University, Dhaka
[3]Lecturer, North Western University, Khulna

ABSTRACT

Waste management is growing more challenging as the global population grows and rubbish types evolve. The growing trash volume and inadequate waste management techniques are also issues. cause for concern. Trash generation is impacted by various social and economic factors, such as population, seasons, public ignorance, and ineffective garbage management. A sustainable waste management system is necessary to address the growing rubbish generation in Dhaka metropolis, which is also expanding with population growth. This essay aims to summarize the waste management landscape from the previous year. The literature review was compiled using desk research, and the bibliographic database was created using Google Scholar. Evaluation results reveal uncollected waste in open areas and streets, causing drainage system clogs and posing health and environmental dangers to inhabitants. Waste management requires further policies and education to enhance its current state. Raising awareness of trash management can enhance waste management and reduce waste production.

INTRODUCTION

The main city of Bangladesh, Dhaka, is experiencing tremendous population expansion and is therefore expanding. With an estimated 25 million residents by 2025, Dhaka City will have maintained its high rate of population expansion and will have surpassed all other megacities. The government now faces the problem of inadequate solid waste management (SWM)(Yasmin, 2017). It is one of the top ranked high-risk cities in the world because of the rapid and uncontrolled urbanization that has taken place in Dhaka. There were only 2.2 million people living there in 1975, but by 2007, that number had increased to 13.5 million, representing a population growth of more than 500 percent in just 32 years(Hasan et al., 2009). Rapid urbanization and changing lifestyles have led to a shift from organic waste to sophisticated plastics, paper, and packaging materials. As garbage kinds and sources diversify and disposal locations grow scarce, storage and collecting systems are getting more complex and expensive. In many growing Asian cities, municipal authorities and landfill operators do not often handle materials recovery and recycling. However, scavengers or unlawful waste pickers at landfill sites decrease recyclable commodities like paper, plastics, glass, and metal(Idris et al., 2004). About 18% of the respondents caused by skin diseases, rash, and itch, the biggest proportion (33%) of the respondents identified caused skin diseases by spreading of waste in water and soil(Tinni et al., 2015). Municipal Solid Waste of Dhaka City is expected to rise from 3,200 tons/day in 2004 to 3,909 tons/day in 2010 and 4,634 tons/day in 2015, according to predictions. Neither the urbanization rate (about 4% per year) nor the GDP growth of Bangladesh (approximately 6% per year) can compare to the average yearly increase in solid trash, which is 1.2%(Yousuf & Rahman, 2007). Besides waste generated from medicals of Dhaka City is causing a worst issue by producing highly toxic metals, toxic chemicals, pathogenic viruses and bacteria(Hassan et al., 2008). Skyscraping garbage amounts are threatening Dhaka City. However, these issues have created opportunities for the city to discover solutions. Innovative technology, disposal methods, behavior changes, and awareness must be implemented by the community and all sectors. An efficient waste management method not only promotes a cleaner environment but also saves citizens money. Dhaka City Corporations primarily fulfill this responsibility(Islam, 2016).

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STUDY AREA

The town of Mirpur is located on the outskirts of Dhaka, Bangladesh, and is a neighborhood in the city's northern region. In addition to being surrounded by Pallabi to the north, it is located in a location that is directly between the Hazrat Shahjalal International Airport in Dhaka and the zoo of the city. It is estimated that there are slightly more than 100,000 people living in the entire region altogether. It is located at the 23° 49' 20.4600" N latitude and at 90° 21' 55.5012" E longitude.

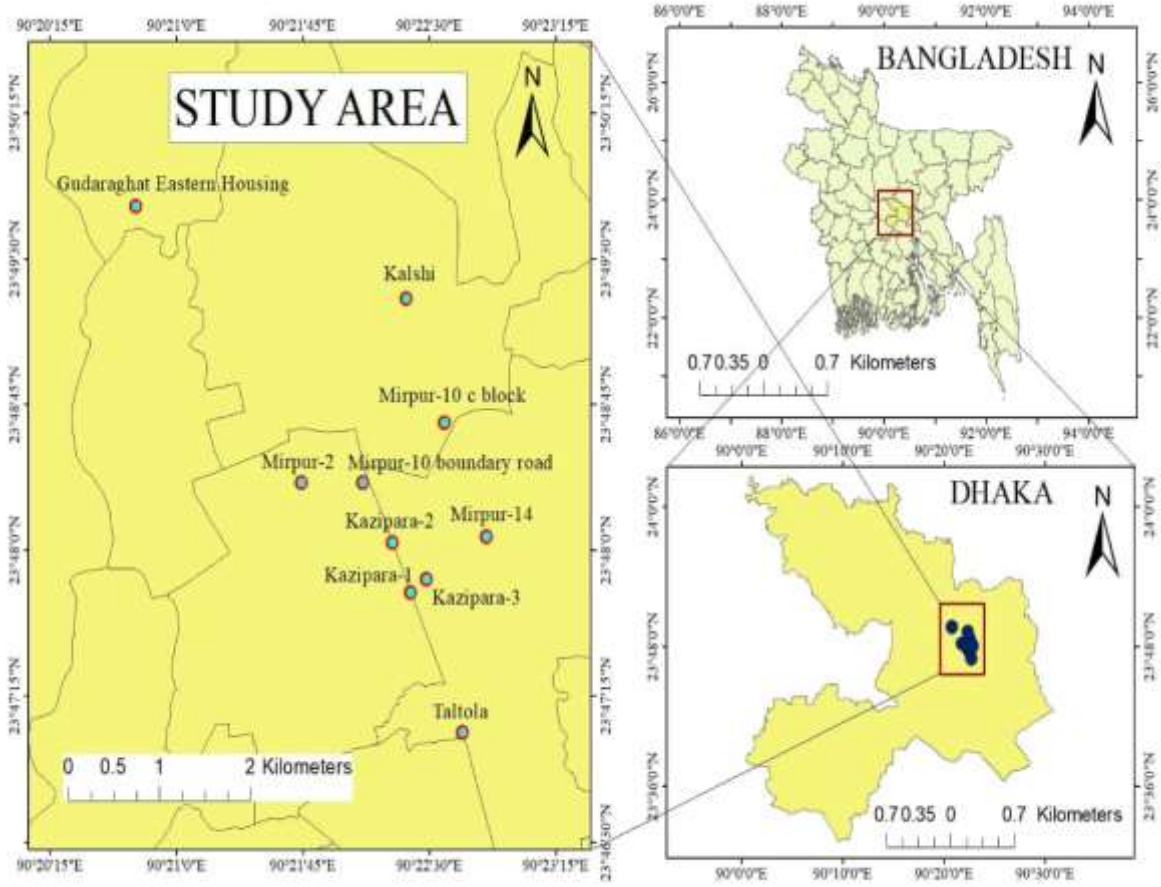

Figure 1 Some waste dumping places of Mirpur region, Dhaka in GIS MAP

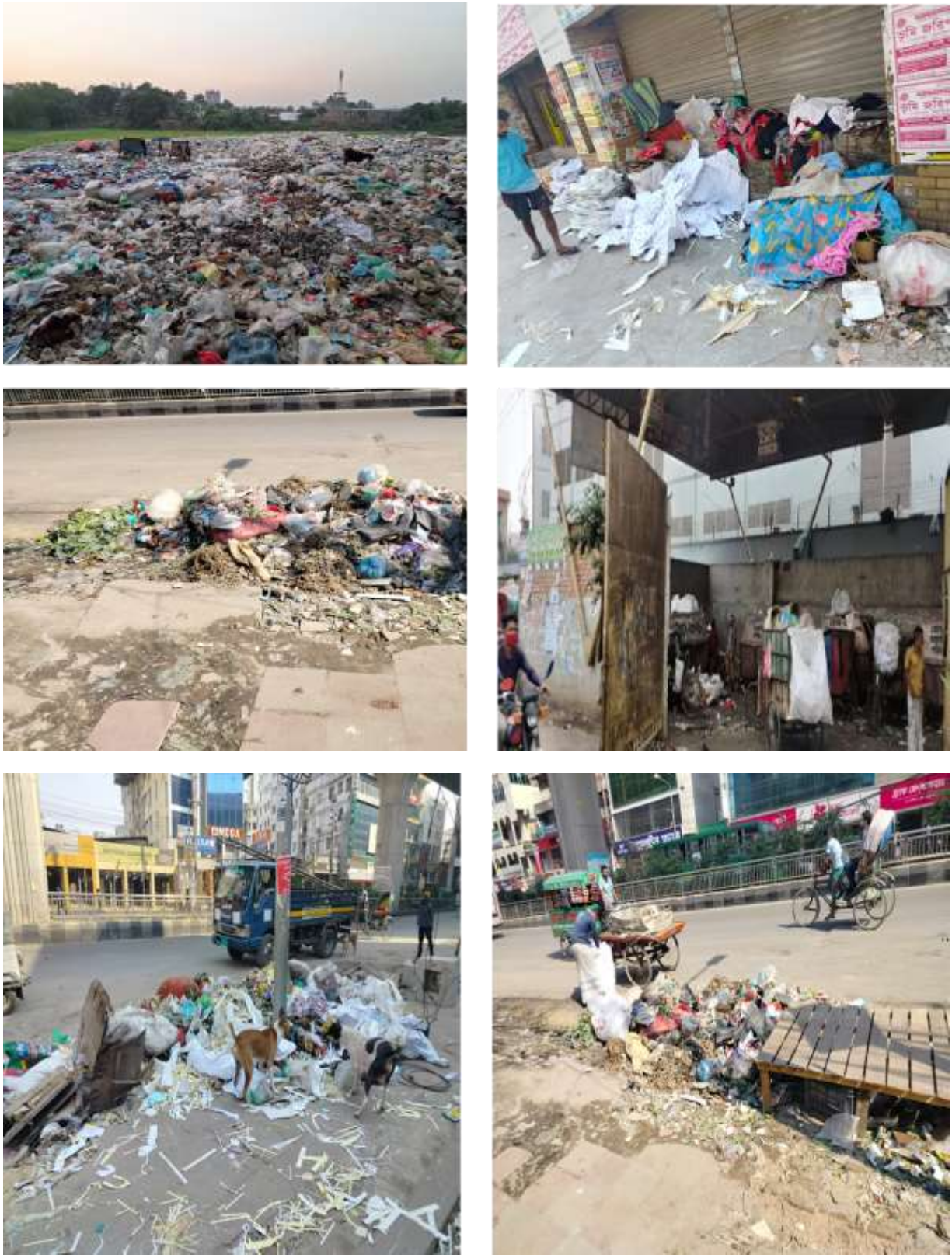

Figure 2 Some waste dumping places of Mirpur region, Dhaka

METHODOLOGY

Questionnaire Survey was performed around the waste dumping places shown in figure 1. The Questionnaire Survey was as follows:

1. Name, Age, Family member & Monthly income
2. Are you aware of any official waste disposal programs in your area?
3. How amount of waste you generate per day?
4. How do you typically dispose of solid waste?
5. How often do you separate recyclable materials (paper, plastic, metal, etc.) from your household waste?
6. Have you ever witnessed illegal dumping of waste (e.g., in vacant lots, along roadsides)?
7. What are the main reasons people in your community may engage in illegal waste dumping?
8. Where do people typically dump waste in your community?
9. Do you think the people of your community is facing different health hazards due to illegal dumping?
10. If “yes” then what is the health issues?
11. What actions do you think would help reduce illegal waste dumping in your community?
12. What do you think is the most effective way to reduce the amount of solid waste dumped in your community?
13. Please share any additional comments or suggestions you have regarding waste disposal or the reduction of illegal waste dumping in your community.

Figure 3 Household collection of waste

RESULTS & DISCUSSION

Questionnaire survey was performed with 10-15 person around of each dumping places. The result of questionnaire survey is as follows:

Table 1 Questionnaire Survey Result

Question	Mostly Answer	Approximate Percentage
Awareness of any official waste disposal programs	No	60%
Typical disposal system of solid waste	Household bin collection	85%
Separation recyclable materials (paper, plastic, metal, etc.)	Sometimes	50%
Witnessed illegal dumping of waste (e.g., in vacant lots, along roadsides)	Yes	75%
Reasons of people in their community may engage in illegal waste dumping	Lack of awareness about environmental impact	50%
People typically dump waste in their community	Along roadsides or streets	85%

People of their community is facing different health hazards due to illegal dumping	Yes	90%
The health issues	Lung Disease, Skin disease, Asphyxia, Asthma	80%
Actions would help to reduce illegal waste dumping in community	Better public education on waste management	45%
Willing to participate in community clean-up activities to address waste dumping issues	Yes	75%
The most effective way to reduce the amount of solid waste dumped	Community involvement in waste management	50%
Additional comments or suggestions	By increasing awareness of people	45%

The majority of Mirpur Dhaka residents are unaware of any formal garbage disposal initiatives, as illustrated in table 1. The majority of individuals usually dispose of solid waste through household bin collection. They occasionally sort recyclables. The majority of what they saw was the unlawful disposal of waste. Illegal dumping occurred because people were ignorant of the consequences for the environment. This illegal dumping is causing a variety of health problems for people. One way to lessen the prevalence of illegal dumping is to improve public education on trash management. They are also enthusiastic about participating in cleanup efforts. Lessening the amount of solid trash disposed is best accomplished when the community is involved in waste management. To lessen the impact of this issue, more people need to be made aware of it.

Table 2 Solid waste generation rate with respect to family income level

Source	Income level (tk/month/family)	Average Rate (kg/person/day)
High-Income group	≥15000	0.566
Middle-Income group	5000~15000	0.439
Low-Income group	≤5000	0.340

The solid waste generation rate was calculated according to income level. It has shown that the high-income group of people has higher average rate of generation of waste (0.566 kg/person/day) and the low-income group of people has lower average rate of generation of waste (0.0.340 kg/person/day). The middle-income group of people has moderate rate (0.439 kg/person/day). So, the rate of generation of waste is increasing with respect to income level.

CONCLUSION

Waste production rises with population. Dhaka City Corporation needs a sustainable, integrated garbage collection and transportation system. Uncollected waste clogs drains, especially in rainy weather. Open waste and dumping make modern technology and equipment filthy. Much garbage is biodegradable and can be recycled sustainably and scientifically. Sustainable solid waste management involves stakeholder cooperation. Dhaka grew without a plan or waste management system. Composting can restore resources sustainably depending on waste composition. To reduce air and water pollution, inorganic waste recycling, landfill disposal with leachate and gas collection, and worker safety are essential. The national government and Dhaka City Corporation should enforce strict waste collection standards to emphasize official over informal waste collection. Formal and informal sectors must collaborate to control solid waste. Informal sector contributions include innovation, technical expertise, and instruction. For sustainable solid waste management in Dhaka, all sectors should work together. Primary garbage management and community-based programs can simplify waste management. Rethinking waste disposal systems and developing varied methods to reduce environmental concerns and create profitable waste solutions is needed now. Improve solid waste management of Dhaka with these tips:

- Establish a systematic waste management system for collecting, transporting, disposing, and recycling solid waste.

- Create a policy and long-term strategy based on a refreshed understanding of the Dhaka environment.
- Start immediate efforts to empower and strengthen capacity in Dhaka City Corporation through local and national government to expedite integrated approach.
- Improve garbage collection practices by improving worker conditions, lowering occupational health hazards, and promoting community-based segregation at source.
- To recover resources, waste recycling should be considered before disposal, and open dumping should be substituted with safer alternatives.
- Foster long-term awareness through media, NGOs, and campaigns to promote trash segregation, recycling, reuse, cleanliness, and personal hygiene.
- Effective Solid Waste Management requires public and private collaborations, which can influence perceptions of excellent urban administration.

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