

EXPLORING HOUSEHOLD SOLID WASTE PATHWAY, COMPOSITION AND MANAGEMENT SOLUTIONS IN HALISAHAR, CHITTAGONG

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ABSTRACT

Solid waste management (SWM) is a complicated issue for urban governments, especially in developing countries like Bangladesh. This study investigates the volume and composition of household solid waste in the Halisahar Residential Area of Chittagong, Bangladesh, along with residents' attitudes and perceptions regarding waste management. A standardized questionnaire was used to survey 75 households from five distinct socioeconomic categories. Waste samples had been gathered, separated, sorted, and weighed from these residences. Waste production is 0.32 kilogram per person and 1.6 kg per dwelling each day. Vegetable and food waste make up the greatest portion of household solid trash, accounting for 65% of all garbage, out of nine categories. The average daily trash generation rate rose to 0.32 kg per person and 1.6 kg per dwelling. Residential solid waste was divided into ten categories, with foodstuff and vegetable waste making up the largest percentage (65%) of the overall garbage. Food and vegetable waste generation increased from 50% in HSEG to 90% in LSEG. About 70% of the garbage was naturally biodegradable. The development of HSW was strongly correlated with monthly income ($r_{xy} = 0.69$), educational attainment (correlation coefficient, $r_{xy} = 0.260$, $p < 0.05$), and the number of households ($r_{xy} = 0.245$, $p < 0.05$) for each home. Local governments are frequently in charge of collecting and disposing of solid trash, although the problem's breadth is considerably more than any municipal body can manage. As a result, residents were seen to use the local garbage management program. The desire to contribute to waste management services has somewhat increased, as seen by the 46% of respondents who said they would be prepared to pay garbage collectors between US\$0.3 and US\$0.4 per month. 25% of respondents could choose 12 to 2 PM as the period allotted for waste pickup. This study effectively demonstrates how household solid waste can be segregated at the source to transform it from a burden to a resource because people understand their responsibility to do so as long as there is a system in place to support them and the burden is allocated based on the volume of waste produced.

Keywords: *Solid Waste Management (SWM), Source Segregation, Household, Socioeconomic and Urban residential area*

1. INTRODUCTION

Waste is produced in vast quantities in industrialized nations. Conversely, emerging nations produce less solid waste (SW) per person due to decreased consumption and, as a result, lower buying power. Bangladesh is a densely populated nation that is rapidly becoming more urbanized, with a significant number of rural residents moving to cities every year. In 2001, just 24% of people were urban dwellers. Migration has increased since then, and by 2024, it was around 41.2% (World Bank, 2024). The increase in overall waste creation is one of the main effects of fast population expansion. This problem has gotten worse in Bangladesh due to uncontrolled urban growth and the increase of slum settlements, which are mostly caused by ongoing migration. As a result, the nation's largest cities Dhaka, Chittagong, as well as Khulna, Rajshahi, Sylhet and Barisal now produce significantly more solid waste (Jerin et al., 2022). Environmental and sanitation conditions are negatively impacted by the overall SW contribution of a big population. As a result, Bangladeshi cities and towns are now very concerned about solid waste management (SWM) (Roy et al., 2022). SW is impeding fair sustainable development by seriously endangering natural resources and irreversibly deteriorating the urban environment. In Bangladesh, all solid waste management (SWM) activities within City Corporations are overseen by the Chief Conservancy Officer (CCO), who reports directly to the City Corporation Mayor (Rahman & Alam, 2020). These organizations' major duty is to properly manage waste in order to preserve the city's hygienic conditions. However, most cities and towns' municipal services are currently overworked and unable to handle the growing demand due to a shortage of staff and resources, which results in filthy and unhygienic living conditions in the neighbourhood (Islam, 2021). Most recent estimates have Bangladesh's daily solid waste production at between 25,000 and 30,000 tons, with Dhaka alone producing between 6,500 and 7,000 tons. Only 42% of the SW generated can be collected and disposed of by Dhaka City Corporation (DCC) (Ahmed et al., 2023). In actuality, the local governments have been unable to the solid waste of this growing populace, mostly due to lack of willingness to pay and financial support for comprehensive sustainable SWM practices (Sultana et al., 2021). However, in some areas of some cities, water treatment plants for community-based waste management are quite effective according to Masum et al. (2018). The economy of Chittagong, the second-biggest city in Bangladesh, is large and self-sufficient. In 1863, it became a city. It became a city corporation in 1990 instead of a municipal corporation. Every day, Chittagong City Corporation produces between 1,300 and 1,356 tons of waste, or around 0.48 kg per person. Household solid trash accounts for the majority of this amount, significantly outweighing the garbage produced by the industrial and healthcare sectors. Over 30% of the municipal waste stream is made up of residential or household garbage, and Asian urban dwellers produce two to three times as much solid waste than their rural counterparts. Chittagong City's waste management and disposal system is seriously challenged by the increasing amount of solid garbage generated by urban communities due to ongoing population increase. Bangladesh has previously undertaken a significant amount of SWM research. Still, no research has yet been done to examine how homeowners' socioeconomic status affects the amount and makeup of MSW. Therefore, this study sought to strengthen the systematic assessment of residential or household solid waste management by quantifying the waste generated in the study area, analysing its composition, and examining how waste generation relates to key socioeconomic characteristics of households. In addition, the study evaluated existing management practices to identify current challenges and potential future improvements.

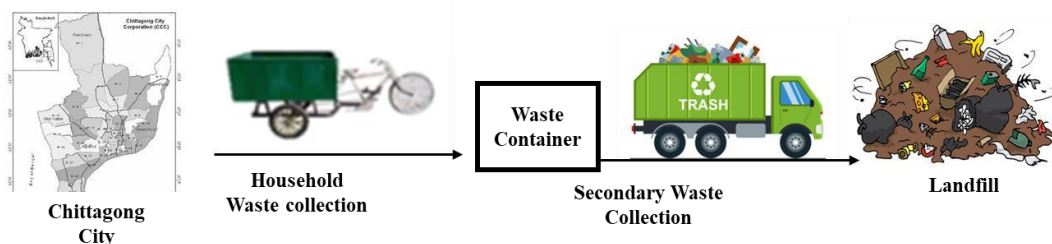


Figure 1: Present Waste Management Scenario.

Figure 1, illustration starts with a map showing the operating region in Bangladesh and provides a simplified visual depiction of the Solid Waste Management (SWM) system that the Chittagong City Corporation (CCC) may deploy. There are two main transit steps in the process: first, waste is collected locally using smaller vehicles like vans, and then it is aggregated and moved in bulk using a bigger garbage truck, usually a compactor, to effectively move the gathered rubbish. The last stage shown is a sizable, unsorted landfill or dump site, which represents the final location for the solid waste to be disposed of.

2. METHODOLOGY

The research was conducted in the Halisahar Residential Area of Bangladesh's Chittagong City Corporation (CCC). CCC has 41 administrative areas, or wards. The study location was specifically chosen for the research and is located under ward number 24, L and K Block, which has a population of around 5500. The goal of the study, which ran from June to November 2025, was to comprehend the quantitative and qualitative elements of the production of household solid waste.

2.1 Over View of Study Area

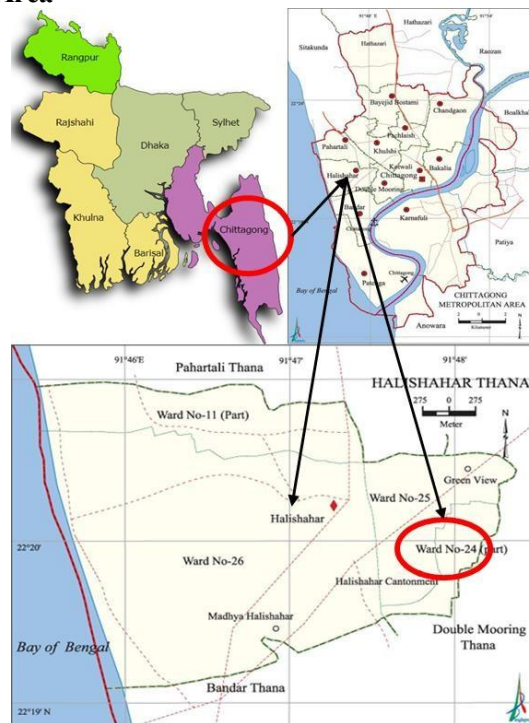


Figure 2: Geographical Context of Study Area.

This figure 2, shows the geographical location of the study area. It highlights Bangladesh, the Chittagong district, and zooms into Halisahar Thana, specifically Ward No. 24. The map clearly traces the study site from national to local scale, helping to visualize the exact area where the research was conducted.

The study used a methodical strategy, which included establishing the research topic, analysing pertinent literature, and explicitly stating the study's objectives. It required creating the survey structure, conducting in-person interviews, measuring the amount of solid trash generated each day at particular residences, and categorizing the garbage according to its nature. After processing and analysing the data to complete the study tasks, the final report was prepared and the results were assessed. The primary fieldwork began in April 2025 with a preliminary survey. Understanding the community's economic situation and evaluating the current solid waste generation situation in the

research region were the goals of this inquiry. It concentrated on pinpointing the precise sites and different sources that contribute to the creation of solid waste, analyzing the region's topography, and compiling data on the amount and caliber of waste made. Data on daily solid waste generation and socioeconomic situations at the home level were gathered using a modified and pre-tested structured questionnaire. It also included several attitudinal questions to assess the households' awareness and perceptions regarding urban solid waste issues. In addition to the questionnaire survey, data were gathered through personal interviews and direct observations involving household members, officials from the City Corporation, and representatives of the K-L Block Somaj Kollan Somitee, the local organization responsible for the collection, transportation, and disposal of household solid waste in the study area.

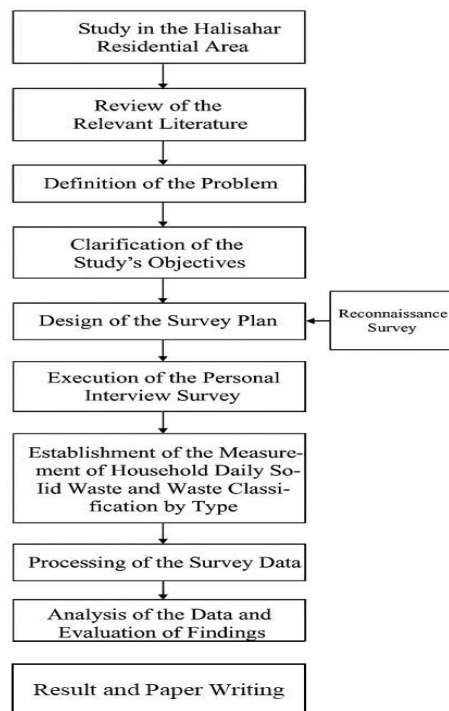


Figure 3: Methodological Framework of the Study.

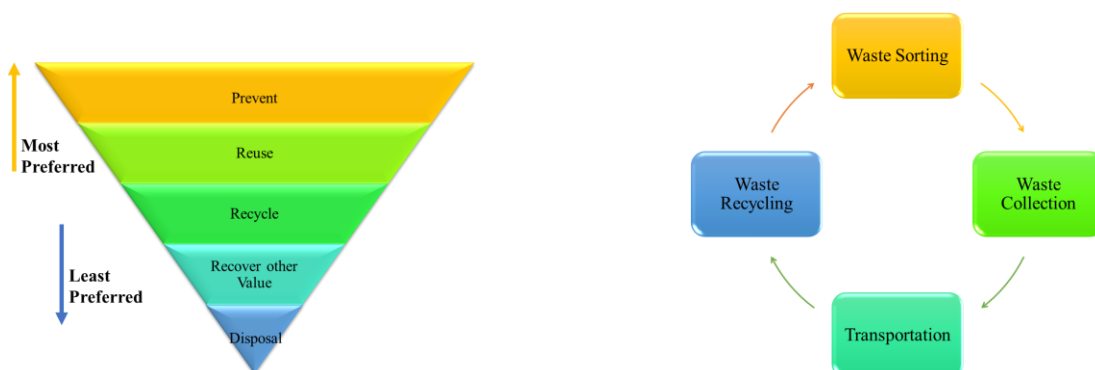


Figure 4: Smart And Sustainable Waste Management Framework.

Figure 04, diagram illustrates a contemporary paradigm for waste management that emphasizes recycling, effective collection, transportation, and waste reduction. It illustrates how sustainable practices may reduce environmental effect by highlighting the waste hierarchy, which goes from prevention and reuse to recycling and disposal. The circular process demonstrates how garbage

sorting, collecting, transportation, and recycling combine to form an effective and sustainable waste management system.

Table 1: Household Socioeconomic Characteristics: Descriptive Statistics.

Factor	Category	Repetition	Percent	Cumulative Percent
1. Spirituality	Muslim	4,989	90.6	90.6
	Hindu	511	9.2	100.0
2. Members per household	1	149	2.6	2.6
	2	367	6.7	9.6
	3–5	2,711	49.3	58.7
	6–8	1,760	32.0	90.7
	>8	513	9.3	100.0
Average		3.39		SD = 0.852
3. Employment per household	1	2,711	49.3	49.3
	2	1,685	30.7	80.0
	3	733	13.3	93.3
	4	371	6.7	100.0
Average		1.77		SD = 0.924

Drawing from the reconnaissance survey and the anticipated economic conditions for 2025, the study area was categorized into five income groups based on monthly household income. These groups include: the Low-Income Group (LG) with earnings below Tk 15,000; the Lower-Middle-Income Group (LMG) earning between Tk 15,000 and Tk 30,000; the Middle-Income Group (MG) earning from Tk 30,000 to Tk 50,000; the Upper-Middle-Income Group (UMG) with incomes ranging from Tk 50,000 to Tk 80,000; and the High-Income Group (HG) comprising households with monthly income exceeding Tk 80,000. Out of the 450 households in the research region, 75 households were examined after 15 households from all groups were chosen at random. Each family was given polythene bags to dispose of their household garbage during the questionnaire survey. These bags were comparable in size and had the respondent's unique code. Each household's garbage was gathered in a plastic bag, weighed, and documented. Following collection, each household's waste was sorted, weighed separately, and documented for each of the 75 homes. This process was carried out every day. The collected waste was spread out on sterile plastic sheets during the separating process, and all sorting was done by hand.

3. RESULT AND DISCUSSION

3.1 Socio Economic Factor

The daily generation of household solid waste is influenced by several economic factors, such as age, occupation, family size, religion, land ownership, length of residence, and education level. The descriptive statistics for these variables are summarized in Tables 1 and 2. According to Table 1, 90.6% of respondents were Muslim, while 9.2% were Hindu. On average, each household consisted of 3.39 members, with 1.77 individuals employed. The mean age of respondents was 43.14 years, whereas the average age of all household members was 30.11 years. Regarding education, household members had an average of 8.05 years of schooling, while respondents had completed an average of 8.84 years of education. About 56% of responders were renters, while the remaining 44% were landowners. Table 2 shows that inhabitants stayed for an average of 3.09 years (Alolayan et al., 2023) looked at comparable socioeconomic indicators in Kuwait. Their study focused on socioeconomic indicators such head age, head education, car ownership, family size, family employment, and family income.

Table 2: Summary of Socioeconomic and Demographic Characteristics of Sample Households.

Factor	Category	Repetition	Percent	Cumulative Percent
1. Age in years				
<i>Mean age per household</i>	< 20	512	9.3	9.3
	20 to < 30	2,129	38.7	48.0
	30 to < 50	2,272	41.3	89.3
	50 to < 60	512	9.5	99.6
	≥ 60	75	1.4	100.20
Mean = 32.10 years, SD = 9.25 years				
<i>Age of Respondent</i>	≤ 24	292	5.4	5.4
	25 – 35	1,760	32.0	37.3
	36 – 45	1,468	26.7	64.0
	46 – 55	1,171	21.3	85.3
	56 – 65	511	9.3	94.7
	66 – 75	149	2.7	97.3
	> 75	149	2.7	100.0
Mean = 43.14 years, SD = 13.41 years				
2. Educational level				
<i>Education (mean years)</i>	0 – 5	1,100	20.0	20.0
	> 5 to 8	2,129	38.7	58.7
	> 9 to 10	951	17.5	76.7
	> 10 to 12	732	13.6	89.4
	> 14	588	10.8	100.33
Mean = 9.84 years, SD = 4.94 years				
<i>Respondent's education level</i>	≤ 6	1,689	30.7	30.7
	> 7 to 10	1,909	34.7	65.3
	> 10 to 12	732	13.2	78.6
	> 12 to 14	511	9.5	88.6
	> 14	659	12.4	100.25
Mean = 9.05 years, SD = 4.71 years				
3. Household property status				
	Property Owner	2,420	44.0	44.0
	Tenant	3,080	56.0	100.0
4. Respondent's residence period				
	< 1	440	8.0	8.0
	1 to < 5	2,200	40.0	48.0
	5 to < 10	1,248	22.7	70.7
	10 to < 15	292	5.2	76.6
	15 to < 20	660	12.4	88.6
	≥ 20	660	12.2	100.10
Mean = 4.09 years, SD = 2.535 years				

3.2 Waste Generation

Sample wastes were gathered and examined from homes belonging to various income groups in order to calculate the trash creation rate. The estimated daily solid waste production of a typical home in the research region is shown in Table 3. The typical home in the Halisahar Residential Area produced 1.6 kg of garbage per day, according to a sampling of 75 families. The findings also show that the various income group under study had distinct rates of waste creation. The tendency is becoming more pronounced as the earnings of various social categories grow. Due to their high purchasing power and therefore high consumption patterns, the typical household's trash generation rate was found to be 0.85 kg/day (minimum) by the LG and 2.60 kg/day (highest) by the HG. Table 4 shows that each research participant produced 0.32 kg of trash at home per day. The study area is home to about 5,500 individuals.

Table 3: Household Waste Generation per Day in Halisahar

Income Based Group	Household sample	Daily waste generation
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	size	(kg/household/day)
LG (Low-income Group)	15	0.85
LMSEG (Lower Middle-income Group)	15	1.20
MSEG (Middle income Group)	15	1.55
UMSEG (Upper Middle-income Group)	15	1.90
HSEG (High income Group)	15	2.60
Total / Average	75	1.6 (avg.)

The daily average home waste production was 0.32 kg per person, or 1.6 kilogram per family. About 70% of the home solid waste was found to be biodegradable, with food and vegetable waste making about 65% of the total.

The results of this study show that more than 1,220 kg of solid trash are produced per day in the study region. In contrast, the estimated daily waste creation per person in six major Bangladeshi cities (Dhaka, Chittagong, Rajshahi, Khulna, Sylhet, and Barisal) was 0.56 kg, 0.48 kg, 0.30 kg, 0.27 kg, 0.30 kg, and 0.25 kg, respectively. The importance of household-level trash in the overall creation of urban garbage is shown by the fact that residential waste alone accounts for over 30% of all municipal solid waste in Asia (World Bank, 2021). According to the report, every member of Bangladeshi families produced 0.15 kilogram of waste on average per day. Over time, waste production has been rising consistently, mostly in tandem with population expansion. This pattern probably accounts for the discrepancy between the per capita garbage generation recorded by the World Bank (2021) and the study area, which is one of Bangladesh's most representative residential regions.

Table 4. Average Daily Waste per Person in Halisahar

Income Based Group	Household sample size	Daily waste generation (kg/household/day)
LG (Low-income Group)	61	0.18
LMSEG (Lower Middle-income Group)	64	0.25
MSEG (Middle income Group)	82	0.30
UMSEG (Upper Middle-income Group)	91	0.36
HSEG (High income Group)	85	0.50
Total / Average	383	0.32 (avg.)

Waste production ranged from 0.18 kg per person per day in low-income families to 0.50 kg per person per day in high-income households, and it was found to rise with both household income and education level. Across all homes, the overall average trash generation rate was 0.32 kg per person per day.

3.3 Physical Composition of Household Solid Waste

Several factors, including dietary habits, cultural practices, socioeconomic status, and climatic conditions, influence the total quantity of solid waste generated. Table 5 presents the effect of income group on the physical composition of solid waste. During the study, waste items such as paper, packaging materials, cans, plastic, cloth, tiles, glass, vegetables, pebbles, and wood were separated and analyzed. Significant variations ($p < 0.05$) were observed across different SEGs for seven specific categories: packaging materials, cans, plastic, glass, vegetables, pebbles, and wood. The highest percentage of waste was discovered to be food and vegetables (62%), while the lowest percentage was found to be textiles, rags, and jute (1%). It was discovered that the can, jar, tin, metal, and packaging materials all reached the same percentage (9%). The following percentages were found: 6%, 5%, 3%, 3%, and 2% for rocks/dirt/miscellaneous, glass/ceramic, wood/grass/leaves, paper/book/printed materials, and plastic/polythene/rubber. In Bangladeshi cities, SW has an extremely high organic content, ranging from 70 to 85%. found that food and vegetables were the most prevalent waste category in Bangladesh (66.65%). Among the SEGs, food and vegetable waste was found to make up

the largest percentage. HSEG generated the least amount of food and vegetable waste (47%), whereas LSEG produced the highest (88%).

Table 5: Physical Composition of HSW Generated by Different Socioeconomic Groups.

Income Based Group	Classification of Waste (% by Weight)								
	Paper	Pack	Can	Plastic	Glass	Rocks	Textile	Vegetable	Wood
LG	2	3	1	2	1	2	1	88	0
LMG	3	4	2	3	2	2	1	83	0
MG	4	5	3	4	3	2	2	76	1
UMG	5	6	4	6	4	2	2	69	2
HSEG	6	8	6	7	5	3	3	58	4
Generation of waste per day (All Gs)	4	5	3	4	3	2	2	65	2

Paper = books, printed materials; Pack = packaging materials; Can = cans, jars, tins, metals; Plastic = plastic, polythene, rubber; Textile = textiles, rags, jute; Glass = glass, ceramics; Vegetable = vegetable and food waste; Rocks = rocks, dirt, miscellaneous debris; Wood = wood, grass, leaves.

The total amount of food and vegetable waste showed an increasing trend from the HG to the LG. Tin, metals, jars, and cans all had the opposite trend. The HG had the highest percentage (14%) of packaging materials, while the LG had the lowest percentage (3%). It was found that the MSEG and UMG provided the same percentage (5%) of packaging materials (Table 5).

Table 6: Summary of Household Views on Residential Solid Waste Management

Variable	Response Category	Count	Proportion (%)	Cumulative Proportion (%)
1. Household Willingness to Engage with Local Waste Management Initiatives	Willing to Receive Service	59	78.7	78.7
	Not Willing to Receive Service	16	21.3	100.0
2. Service Satisfaction Level	Satisfied	48	64.0	64.0
	Not satisfied	12	16.0	70.0
	Do not take service	15	16.0	110.0
3. Rationality of Payment	Rational	43	57.3	55.3
	Not rational	17	22.7	82.0
	Don't know	15	24.0	100.00

In the HG group, the category of pebbles, soil, and miscellaneous materials accounted for the highest proportion (10%). Within the UMG group, the largest shares were observed for glass/ceramic (6%) and plastic/polythene/rubber (3%). Wood, grass, and leaves also showed the highest proportion in HG (4%). The MG group recorded the greatest percentage of paper, books, and printed materials (4%), whereas the proportion of textiles, rags, and jute was highest in both MG and UMG (2%) (Table 5). A significant amount of the solid trash in the study region was compostable, as the discussion above shows. Food, vegetables, rags, jute, wood, grass, leaves, etc. are all included in the stable component of HSW (Rahman et al., 2024). Paper, packing materials, cans, jars, tin, metals, plastic, polythene, rubber, glass, ceramics, rock, and soil were found to make up 66% and 34% of the HSW research area, respectively. According to (Rahman et al., 2024), a significant percentage of waste in Bangladesh's metropolitan regions (69–77%) was biodegradable. Urban solid waste's high organic content suggests that regular collection and removal are required. This implies that organic waste has a strong chance of being recycled.

3.4 Correlation of Solid Waste Quantity with Socioeconomic Factors

Correlation analysis was conducted to determine the strength of the relationship between socioeconomic characteristics and the daily amount of solid waste generated by households. A significant positive correlation was observed between household solid waste output and family size ($r = 0.245$, $p < 0.05$), indicating that larger households tend to produce more waste daily (Figure 5). In addition, a positive association was found between solid waste generation and the family's educational level, measured as the average number of years of schooling ($r = 0.260$, $p < 0.05$). This demonstrates that the daily quantity of SW generated rises as a family member's level of education does (Figure 6). A family with highly educated individuals is generally expected to generate less SW daily. It's interesting to note, though, that in the research region, the tendency was actually reversed. Furthermore, a strong correlation between income ($r_{xy}=0.691$, $p<0.01$) and SW generation was found, suggesting that households with greater monthly earnings often generate more SW daily (Figure 7). As the monthly income of the various socioeconomic categories grew, waste creation was shown to be gradually increasing.

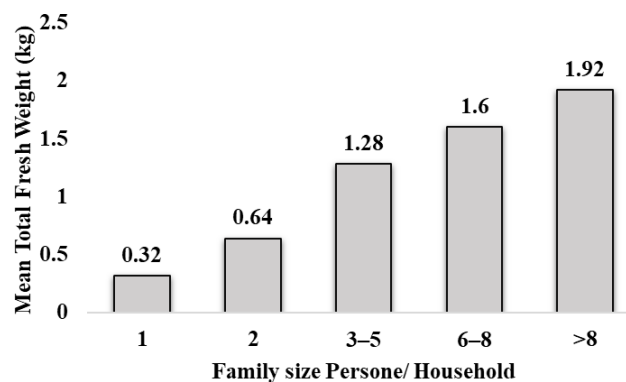


Figure 5: Variation in Household Solid Waste Generation by Family Size.

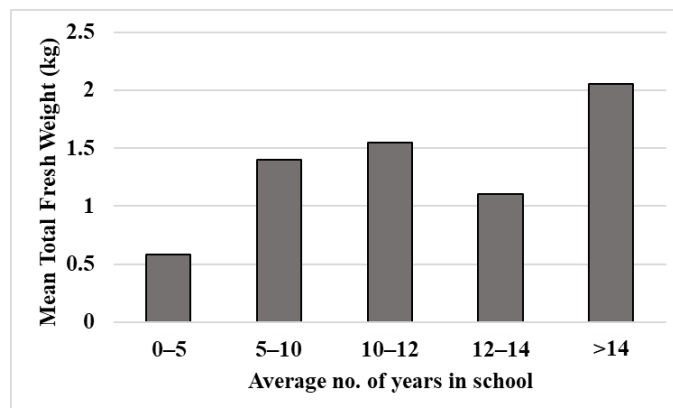


Figure 6: Distribution of Household Waste Generation Across Education Levels.

3.5 Household perspectives on the administration of Household Solid Waste

Household participation is crucial for the success of any program aimed at reducing solid waste at its source. An informed and engaged public greatly facilitates the effective implementation of such initiatives. Conversely, a disengaged or uninformed audience can hinder program outcomes. Responses to various questions regarding household attitudes toward waste management are presented in Tables 6 and 7 for the sampled households.

3.6 The current management system in the study field

The Somaj Kollan Somitee is a local group that collects, transports, and disposes of waste in the research region. Among households using the local waste management services, 80% reported overall satisfaction, with 61.3% expressing satisfaction and 18.7% expressing dissatisfaction. Regarding

service fees, 54.7% of respondents considered the amount paid to be reasonable, while 25.3% disagreed (Table 7).

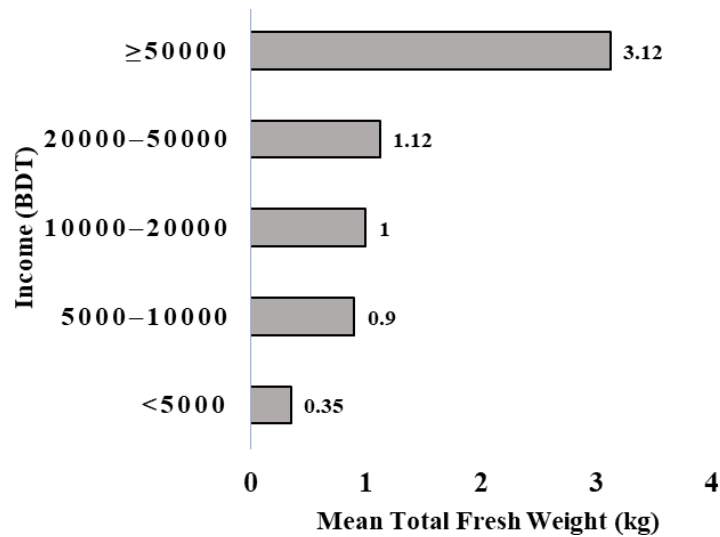


Figure 7: Household Income and Its Influence on HSW Generation (1 US\$ = ৳122).

3.7 Household Perspectives on Solid Waste Management

The survey assessed households' attitudes and participation in solid waste management (SWM) in the Halisahar Residential Area. It shows the willingness of respondents to pay for waste collection services. Nearly 44% of households reported that they would be prepared to pay the garbage collector between Tk. 100 and Tk. 200 per month (1 US\$ = BDT 122) (Table 6). Regarding preferred collection times, 22.7% of respondents preferred waste to be collected between 12 and 1 PM, 21.3% preferred 10 to 11 AM, and 14.7% preferred 9 to 10 AM (Table 6). In terms of waste disposal locations, 80% of households reported using the services of the waste collector. About 7% of households disposed of garbage in sewers, nearly 11% in public areas, and only 1% within their own compound (Table 6). Regarding responsibility for SWM, 56% of households considered the municipality solely responsible, 17.3% believed a local committee could handle waste issues within the residential area, another 17.3% suggested SWM could be managed as a commercial enterprise, and 9.3% viewed individuals as primarily responsible (Table 7). Respondents were also asked about their personal involvement in household waste management. Approximately 14% reported that they frequently reuse or recycle waste using traditional methods before disposal, while 29.3% indicated they would be willing to sort waste items if provided with appropriate tools. A substantial proportion (42.7%) reported that their involvement in SWM is limited to assisting with the collection system. When asked to identify the most pressing SWM issues, 41% of households cited unpleasant odor as the primary problem, 33% highlighted hazards caused by open dumping along roadsides, 12% noted that waste obstructs natural drainage channels leading to flooding during the rainy season, and 7% pointed out irregularities in the collection system, whether managed by local services or the municipality. Despite these challenges, local communities, business organizations, and NGOs can collaborate to achieve sustainable SWM. A majority of households (61.3%) expressed satisfaction with the service provided by local organizations. Based on these findings, community-based organizations (CBOs) or local initiatives appear to be the most effective solution for promoting sustainable SWM in residential areas across Bangladesh.

Table 7. Household Perceptions of Residential Solid Waste Management: Frequency Analysis.

Variable	Category	Frequency	Percent	Cumulative Percent
1. Payment Willingness (Tk)	< 50 Tk	8	10.7	10.7
	50 – < 100 Tk	30	40.0	50.7

	100 – < 1500 Tk	13	17.3	68.0
	> 200 Tk	10	13.3	81.3
	No comment	14	18.7	100.0
2. Waste Collection Time (Expected)	6 AM	4	5.3	5.3
	Between 7 AM and 9 AM	9	12.0	17.3
	Between 9 AM and 12 PM	13	17.3	34.7
	Between 12 PM and 1 PM	8	10.7	45.3
	Between 1 PM and 2 PM	15	20.0	65.3
	Between 2 PM and 4 PM	8	10.7	76.0
	Between 4 PM and 5 PM	4	5.3	81.3
	After 5 PM	1	1.3	82.6
	No comment	13	17.3	100.0
3. Household Waste Disposal Site	Open place	7	9.3	9.3
	To waste collector	61	81.3	90.6
	Throwing into drains	4	5.3	95.9
	Private Yard /Compound	2	2.7	98.6
	Covered dustbin	1	1.3	100.0
4. Waste Management Responsibility	Municipality	41	54.7	54.7

4. CONCLUSION

Bangladesh's rapid urbanization, population growth, and changing consumption patterns continue to challenge solid waste management (swm). Household waste generation in residential areas like Halisahar, Chittagong, averages 0.32 kg per person and 1.6 kg per household per day, with approximately 70% being biodegradable, mainly food and vegetable waste. The high organic content highlights the need for regular collection and presents opportunities for recycling and composting. The study found that higher-income households generate more waste, although collection fees are uniform across socioeconomic classes, emphasizing the need for an equitable system aligned with waste production. About 80% of households reported satisfaction with local waste collection services, and many expressed willingness to contribute financially, reflecting growing awareness of proper swm practices. Community engagement is crucial, as local authorities cannot manage all the waste alone. Households can contribute significantly by adopting source segregation using color-coded bins, environmentally friendly disposal, and sustainable consumption practices. The study demonstrates that with supportive mechanisms, community-based waste management can transform household solid waste from a burden into a resource. To improve (swm) effectiveness, regular monitoring, seasonal evaluations, and public participation are essential. The findings provide local authorities and communities in Chittagong with up-to-date baseline data on household waste generation and composition, supporting the development of sustainable management strategies. Implementing organized, community-focused (swm) systems backed by local governments and relevant organizations can substantially reduce environmental pollution and health risks in Bangladeshi cities.

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