An Analysis of Waste Management Practices in Selected Buffet Restaurants in Quezon City, Philippines

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ABSTRACT

Buffet restaurants have become a popular dining choice in Quezon City, offering customers a wide variety of dishes in an unlimited-serving format. While this attracts large volumes of patrons daily, it also generates substantial amounts of waste, particularly food scraps, packaging materials, and kitchen by-products. Effective waste management in these establishments is critical—not only for operational efficiency and cost control but also for environmental sustainability and compliance with the Ecological Solid Waste Management Act of 2000 (Republic Act 9003).

This study examined the waste management practices of selected buffet establishments using a mixed-method approach, combining quantitative measurements focusing on collection, segregation, and disposal accuracy with qualitative insights from interviews and observations. Using a purposive sampling, data were gathered from 200 respondents, including Local Government Unit (LGU) employees, restaurant managers, and staff, through a structured survey. Statistical tools such as weighted mean, percentage, and one-way ANOVA were employed to analyze perceptions and identify challenges.

Findings revealed that waste management practices in the selected establishments were rated as *highly practiced* across all three components, with waste collection and disposal receiving the highest composite mean scores. Statistical analysis showed no significant difference in assessments among the three respondent groups, suggesting a shared perception of effective waste management implementation. Challenges, such as irregular collection schedules and limited trash bins, were reported but considered *very least encountered*.

The study concludes that buffet restaurants in Quezon City generally demonstrate strong compliance with waste management regulations, contributing to environmental sustainability and operational efficiency. Recommendations include continuous monitoring, enhanced coordination with LGUs, and expanded awareness campaigns to maintain and further improve waste management practices. These findings can serve as a valuable reference for policymakers, restaurant operators, and future researchers in promoting sustainable food service operations.

Keywords: waste management practices, collection, segregation, disposal, an analysis, Quezon City

METHODOLOGY

This study used a mixed-methods design, combining quantitative measurements with qualitative insights to assess waste management practices in selected buffet restaurants in Quezon City. The quantitative component involves evaluating waste collection, segregation, and disposal through survey questionnaire. The qualitative component consists of interviews with restaurant managers and staff to gather insights on their experiences, challenges, and strategies related to waste management.

A total of 200 respondents participated, consisting of Local Government Unit (LGU) employees, restaurant managers, and restaurant employees. Respondents were chosen through purposive sampling to ensure they had direct knowledge of waste management operations.

Data were collected using a researcher-made survey questionnaire with three parts: (1) demographic profile, (2) assessment of waste management practices in terms of collection, segregation, and disposal, and (3) challenges encountered. Surveys were administered face-to-face after securing permission from restaurant management and the Local Government Unit Heads. Selected restaurant managers and staff were interviewed as well to get their opinions regarding waste management practices in the restaurants.

The data were analyzed using percentage and weighted mean to interpret responses, while one-way ANOVA was used to determine if there were significant differences among the three groups of respondents. The Likert scale was applied to measure the degree of practice and the extent of challenges encountered.

Interview Results (with Incorporated Responses)

The interviews provided valuable insights into how waste management is actually practiced in buffet restaurants, highlighting the gap between policies and daily realities. Respondents from the LGU, restaurant managers, and restaurant employees shared their experiences on awareness, customer behavior, challenges, and possible solutions, offering a fuller picture of both obstacles and opportunities for improvement.

Awareness vs. Practice

Both managers and employees confirmed that they are aware of the waste management rules, but admitted that implementation is inconsistent.

- An LGU staff shared, *"Most restaurants know the rules, but it's hard to do them every day when no one is checking."*

- A restaurant manager explained, *"We follow segregation rules, but during busy hours, staff and customers don't always use the right bins."*

- An employee added, *"We follow the rules, but during peak times, serving customers takes priority over waste handling."*

Customer Behavior and Plate Waste

Participants highlighted that customer habits strongly influence food waste in buffets.

- A staff member observed, *"A lot of waste comes from customers taking too much food and not finishing it."*

- A manager said, *"Buffet guests expect plenty of choices, so we prepare more food, and that creates more leftovers."*

- Another manager added, *"We meet city requirements but want to improve, possibly by working with composting facilities for biodegradable waste."*

Barriers to Proper Waste Management

Restaurant workers described the challenges they face in maintaining proper waste handling.

- An LGU employee admitted, *"We don't have enough people to monitor restaurants closely, so we rely on their cooperation."*

- A restaurant manager said, *"We want to try composting or donations, but safety, cost, and logistics make it difficult."*

- A restaurant employee explained, *"When the restaurant is full, we focus on serving customers first, and segregation becomes less important."*

Possible Solutions and Collaboration

Despite these issues, participants expressed willingness to improve practices through cooperation and innovation.

- An LGU staff member suggested, *"Stricter enforcement and maybe rewards for good practices could encourage compliance."*

- A restaurant employee said, *"If we had more support and better training, we could do it properly every day."*

- A manager emphasized, *"Good waste management can save costs in the long run and attract eco-friendly customers."*

RESULTS

Tables

Sub-Problem No.1: How do Local Government Unit Employees, Managers, and Restaurant Employees assess the Waste Management Practices of Selected buffet restaurants in Quezon City in terms of Collection, Segregation; and Disposal?

Waste Collection

Table 1. Assessment of Waste Collection

Indicators	Managers		LGU Employees		Employees		Composite		Rank
	WM	VI	WM	VI	WM	VI	WM	VI	
1. Retrieves and consolidates waste materials directly from their points of generation within the establishment.	5.00	HP	4.70	HP	4.70	HP	4.80	HP	3
2. Utilizes color-coded bins and designated collection bags in accordance with established segregation guidelines.	4.90	HP	4.70	HP	4.38	HP	4.66	HP	4
3. Adheres to the prescribed schedule for municipal or contracted waste collection services.	5.00	HP	4.90	HP	4.80	HP	4.93	HP	1
4. Transfers waste to officially designated collection or pick-up areas for proper disposal.	4.70	HP	4.90	HP	4.83	HP	4.81	HP	2
Overall weighted mean	4.90	HP	4.83	HP	4.68	HP	4.80	HP	

Legend:

5   4.20-5.00   Highly Practiced   HP

4   3.40-4.19   Practiced   P

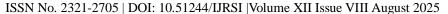|			
3	*2.60-3.39*	*Moderately Practiced*	*MP*
2	*1.80-2.59*	*Least Practiced*	*LP*
1	*1.00-1.79*	*Very Least Practiced*	*VLP*

Table 1 presented the assessment of the three groups of respondents as to the waste management practices in terms of waste collection rated as highly practiced in selected buffet restaurants in Quezon City as manifested by the overall weighted mean of 4.80, and ranked the indicators such as "Adheres to the prescribed schedule for municipal or contracted waste collection services." with a composite weighted mean of 4.93, as rank 1; "Transfers waste to officially designated collection or pick-up areas for proper disposal" with a weighted mean of 4.81, as rank 2; "Retrieves and consolidates waste materials directly from their points of generation within the establishment." with a weighted mean of 4.80, as rank 3, and lastly, "Utilizes color-coded bins and designated collection bags in accordance with established segregation guidelines." with a composite weighted mean of 4.66, as rank 4, respectively.

Waste Segregation

Table 2. Assessment of Waste Segregation

Indicators	Managers		LGU Employees		Employees		Composite		Rank
	WM	VI	WM	VI	WM	VI	WM	VI	
1. Separates biodegradable waste from non-biodegradable waste in accordance with established environmental guidelines.	4.90	HP	4.50	HP	4.73	HP	4.71	HP	4
2. Identifies and segregates recyclable materials—such as food packaging, glass, paper, plastic bottles, and organic kitchen waste—for proper recovery and reuse.	4.90	HP	5.00	HP	4.53	HP	4.81	HP	2
3. Employs color-coded receptacles for waste segregation, ensuring hazardous items such as broken glass are appropriately contained.	4.90	HP	4.90	HP	4.68	HP	4.83	HP	1
4. Prepares and maintains separate containers for wet and dry waste to facilitate efficient handling and disposal.	5.00	HP	4.70	HP	4.60	HP	4.77	HP	3
Overall weighted mean	**4.93**	**HP**	**4.78**	**HP**	**4.64**	**HP**	**4.78**	HP	

As stated in Table 2, the Local Government Unit employees, managers, and restaurant employees assessed the waste management practices in selected buffet restaurants in Quezon City in terms of waste segregation as highly practiced as indicated by the overall weighted mean of 4.78; and ranked the indicators such as "Employs color-coded receptacles for waste segregation, ensuring hazardous items such as broken glass are appropriately contained" with a composite weighted mean of 4.83, as rank 1; "Identifies and segregates recyclable materials—such as food packaging, glass, paper, plastic bottles, and organic kitchen waste—for proper recovery and reuse." with a composite weighted mean of 4.81, as rank 2; "Prepares and maintains separate containers for wet and dry waste to facilitate efficient handling and disposal." with a weighted mean of 4.77, as rank 3, and lastly, "Prepares and maintains separate containers for wet and dry waste to facilitate efficient handling and disposal." with a composite weighted mean of 4.71, as rank 5, respectively.

Waste Disposal

Table 3. Assessment of Waste Disposal

Indicators	Management		LGU Employees		Employees		Composite		Rank
	WM	VI	WM	VI	WM	VI	WM	VI	
1. Ensures strict adherence to established protocols for the safe and responsible disposal of used cooking oil.	4.50	HP	4.70	HP	4.90	HP	4.70	HP	5
2. Maintains proper waste handling and disposal practices within all operational areas of the restaurant.	4.90	HP	4.80	HP	4.80	HP	4.83	HP	2
3. Implements standardized waste disposal procedures consistently across the establishment.	4.80	HP	4.80	HP	4.90	HP	4.83	HP	2
4. Conducts independent waste disposal operations by the buffet restaurant at the designated external waste management facility of the mall.	4.90	HP	4.70	HP	4.80	HP	4.80	HP	4
5. Segregates and disposes of waste appropriately within the mall's designated collection or dumping area.	4.80	HP	4.90	HP	4.78	HP	4.83	HP	2
Overall weighted mean	**4.78**	**HP**	**4.78**	**HP**	**4.84**	**HP**	**4.80**	**HP**	

As revealed in Table 3, the three groups of respondents rated the waste disposal in selected buffet restaurants in Quezon City as highly practiced as supported by the overall weighted mean of 4.80; and ranked the indicators such as "Maintains proper waste handling and disposal practices within all operational areas of the restaurant.," "Implements standardized waste disposal procedures consistently across the establishment," and "Segregates and disposes of waste appropriately within the mall's designated collection or dumping area." all with a composite weighted mean of 4.83, as rank 2 respectively; "Conducts independent waste disposal operations by the buffet restaurant at the designated external waste management facility of the mall" with a composite weighted mean of 4.80, as rank 4, and lastly, "Ensures strict adherence to established protocols for the safe and responsible disposal of used cooking oil" with a composite weighted mean of 4.70, as rank 5, respectively.

Table 4. Summary of Assessments as to Waste Management Practices

Indicators	Managers		LGU Employees		Employees		Composite		Rank
	WM	VI	WM	VI	WM	VI	WM	VI	
1. Waste Collection	4.90	HP	4.83	HP	4.68	HP	4.80	HP	1.5

2. Waste Segregation	4.93	HP	4.78	HP	4.64	HP	4.78	HP	3
3. Waste Disposal	4.78	HP	4.78	HP	4.84	HP	4.80	HP	1.5
Overall weighted mean	4.87	HP	4.80	HP	4.72	HP	4.79	HP	

Table 4 summarized the overall the assessment of the Local Government Unit employees, managers, and restaurant employees as to the waste management practices in selected buffet restaurants in Quezon City as highly practiced as evidenced by the grand mean of 4.79; and ranked the sub-variables such "Waste Collection" and "Waste Disposal" both having the same weighted mean of 4.80, as rank 1.5, while "Waste Segregation" with a composite weighted mean of 4.78, as rank 3.

Sub-Problem No. 2: Is there a significant difference among the assessments of the three groups of respondents as to the waste management practices of selected buffet restaurants in Quezon City using the above-mentioned variables?

Table 5. Comparative Assessment of Respondents as to Waste Management Practices

Sources of Variation	ss	df	MS	F-stat	Decision	VI
Between	0.0338	2	0.0169	2.7618	Accept H$_o$	Not Significant
Within	0.0367	6	0.0061			
Critical value at 0.05 = 5.14						

As manifested in Table 5, the computed F-value of 2.7618 is less than the critical value of 5.14 with 2 and 6 degrees of freedom at a 0.05 level of significance. Hence, the null hypothesis is accepted and interpreted as not significant. Therefore, there are no significant difference among the assessments of the three groups of respondents as to waste management practices in selected buffet restaurants in Quezon City in terms of waste collection, waste segregation, and waste disposal.

Sub-Problem No.3: What are the challenges encountered by the respondents?

Table 6. Assessment of Challenges Encountered

Indicators	Managers		LGU Employees		Employees		Composite		Rank
	WM	VI	WM	VI	WM	VI	WM	VI	
1. The proper time of garbage collection is not observed	1.10	VLE	1.00	VLE	2.78	ME	1.63	LE	1
2. Irregular schedule of collection for waste.	1.10	VLE	1.10	VLE	2.46	LE	1.55	LE	3
3. Failure to adhere to the scheduled waste of collection time.	1.10	VLE	1.10	VLE	2.40	LE	1.53	LE	4
4. Proper segregation of waste is not observed.	1.00	VLE	1.00	VLE	2.38	LE	1.46	VLE	7
5. Unable to sanitize the facility used for segregating and composting wastes.	1.30	VLE	1.10	VLE	2.28	LE	1.56	VLE	2

6. Limited trash bins for non-biodegradable and biodegradable wastes.	1.10	VLE	1.00	VLE	2.30	LE	1.47	VLE	6
7. Proper disposal of waste is not observed.	1.20	VLE	1.00	VLE	2.13	LE	1.44	VLE	8.5
8. Papers and plastic materials used to serve food are not disposed properly.	1.10	VLE	1.00	VLE	2.23	LE	1.44	VLE	8.5
9. Lack of knowledge about how waste disposal works.	1.30	VLE	1.00	VLE	2.18	LE	1.49	VLE	5
10. Leftovers were not disposed properly.	1.00	VLE	1.00	VLE	2.13	LE	1.38	VLE	0
Overall weighted mean	**1.13**	VLE	**1.03**	VLE	**2.33**	LE	**1.50**	**VLE**	

As stated in Table 3, it was clearly indicated in the data that the aggregated overall composite weighted mean of 1.50 signifies that the Local Government Unit employees, managers, and restaurant employees assessed challenges encountered as to waste management practices of selected buffet restaurants in Quezon City as very least encountered.

"Proper time of garbage collection is not observed" with weighted mean of 1.44, "Irregular schedule of collection for waste" with weighted mean of 1.55, and "Failure to adhere to the scheduled waste of collection time" with weighted mean of 1.53, "Proper segregation of waste is not observed" with weighted mean of 1.46, "Unable to sanitize the facility used for segregating and composting wastes" with a weighted mean of 1.56, "Limited trash bins for non-biodegradable and biodegradable wastes, Proper disposal of is not observed" with weighted mean of 1.47, "Papers and plastic materials used to serve food are not disposed of properly," with weighted mean of 1.44 "Lack of knowledge about how waste disposal works, and Leftovers did not dispose of properly" with weighted mean of 1.49.

In addition to survey results, interviews with LGU employees, restaurant managers, and restaurant employees revealed that although awareness of waste management policies is generally high, consistent application remains a challenge. During peak service hours, proper segregation and handling are sometimes set aside to prioritize customer service. Customer behavior also plays a significant role, as many diners take more food than they can finish. Managers admitted that the buffet style itself—built on variety and abundance—inevitably creates surplus, though some showed interest in alternatives like composting to better manage biodegradable waste.

Participants also identified barriers such as limited manpower, financial pressures, safety risks, and weak enforcement mechanisms. Despite these constraints, there was a shared willingness to improve current practices. Suggestions included closer monitoring, expanded training, and incentive systems. Managers further noted that adopting sustainable approaches could not only reduce costs over time but also appeal to eco-conscious customers. Overall, while buffet restaurants are aligned with existing regulations, opportunities remain to make waste management more consistent, efficient, and sustainable.

DISCUSSIONS

The assessment of waste management practices in selected buffet restaurants in Quezon City, as evaluated by Local Government Unit (LGU) employees, restaurant managers, and restaurant employees, revealed that waste collection, segregation, and disposal were all highly practiced. Across the three dimensions, the highest-rated aspects included strict adherence to waste collection schedules, the use of color-coded bins for segregation, and

consistent implementation of standardized disposal procedures. The composite means for waste collection (4.80) and waste disposal (4.80) were jointly ranked first, while waste segregation (4.78) closely followed.

The quantitative results showed remarkable uniformity across respondent groups, as statistical testing indicated no significant differences in their assessments. This suggests a shared perception of waste management compliance and effectiveness, regardless of the respondents' roles.

In terms of specific practices, managers and staff consistently highlighted adherence to municipal collection schedules and the use of proper disposal points as top priorities. Segregation was also rated highly, with particular emphasis on the use of color-coded receptacles to separate hazardous, biodegradable, and recyclable waste.

Despite these positive assessments, reported challenges were minimal and rated as "very least encountered" overall (composite mean = 1.50). The few issues noted included occasional lapses in observing collection schedules, limited trash bins, and insufficient sanitation of waste-handling facilities. These findings indicate that while buffet restaurants demonstrate strong compliance with waste management standards, operational efficiency could still be improved in certain logistical aspects.

The results highlight that integrated waste management systems are being successfully implemented, but sustaining these practices during peak operational hours and ensuring resource adequacy (e.g., sufficient bins, facility sanitation) remain critical for further improvement.

Quantitative results indicated that buffet restaurants in Quezon City generally comply with waste management rules, **however, the interviews showed that consistency is still a challenge**. Restaurant employees and restaurant managers admitted that waste segregation often weakens during peak hours when quick service takes priority. Customer behavior also plays a big role in plate waste, as many diners take more food than they can finish, and the buffet setup itself—focused on variety and abundance—naturally creates surplus. These insights suggest that raising customer awareness and introducing portion control strategies could help reduce waste.

Respondents also pointed to barriers such as limited staff, costs, safety concerns, and weak enforcement, which make advanced practices like composting or food donations harder to sustain. Despite these challenges, both LGU employees and restaurant managers expressed willingness to collaborate, recognizing that sustainable practices can lower costs and attract eco-conscious customers. Overall, while compliance is evident, stronger collaboration, training, and customer participation are needed to make waste management more consistent and sustainable.

CONCLUSIONS

The waste management practices in the selected buffet restaurants in Quezon City are carried out with notable consistency and effectiveness, covering all key components of collection, segregation, and disposal. Across all respondent groups—managers, local government unit employees, and restaurant staff—there is a shared agreement that these practices are highly implemented and aligned with the city's existing environmental regulations. While the overall assessment reflects strong compliance and operational discipline, only minimal challenges were reported, suggesting that any constraints encountered have a limited impact on the overall effectiveness of the waste management systems in place.

While compliance is strong, **interviews revealed** that consistency sometimes weakens during peak hours, as fast service takes priority, and that customer behavior—such as taking more food than they can finish—adds to plate waste. Challenges like limited staff, costs, safety concerns, and weak enforcement also make it difficult to adopt advanced practices such as composting or food donations. Even so, managers, staff, and LGU representatives expressed a willingness to improve, recognizing that better training, monitoring, and customer engagement could not only reduce waste but also cut costs and appeal to more eco-conscious diners.

RECOMMENDATIONS

In light of the findings of the study, the following are highly recommended.

1. Management and restaurant employees may continue implementing effective waste management practices in strict adherence to existing ordinances issued by the Local Government of Quezon City. Consistency in these efforts will help maintain environmental standards and support the city's sustainability goals.

2. In collaboration with the LGU, management may establish a regular monitoring system to ensure waste management protocols are consistently followed. Employees should remain updated on the latest waste management regulations and guidelines from local authorities, ensuring full compliance and making timely adjustments to operational practices when needed.

3. Management should work closely with the Quezon City LGU to address operational challenges, such as ensuring timely daily garbage collection and maintaining the cleanliness of facilities used for waste segregation and composting. Proactive coordination can help eliminate minor inefficiencies before they escalate.

4. Further research is recommended using the same parameters, **consider all buffet restaurants in Quezon City and to involve customers as respondents, since their dining habits greatly influence food waste and can provide valuable insights for developing more practical and effective waste management strategies.** This will help validate and strengthen the reliability and accuracy of the present study's findings while allowing for broader perspectives.

5. Employees should actively raise awareness among colleagues about the value of proper waste management and environmental sustainability. Sharing relevant information, practical resources, and best practices can inspire more consistent adoption of responsible habits across the workforce.

6. Management and staff should conduct targeted awareness campaigns for customers, employees, community members, and nearby businesses. These campaigns can focus on the benefits of proper waste management, reduction strategies, and effective segregation. Communication channels may include social media, infographics, informational posters, and participation in local environmental events

7. The management of buffet restaurants, in partnership with the LGU, should provide targeted training and simple reminder systems to help staff balance customer service with proper waste handling, ensuring more consistent waste segregation even during peak hours.

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