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Waste Sustainability: An Inventory of Edible Food Waste Products From Selected Hotels in Manila

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Abstract: This study investigates the sustainability of waste management practices in selected hotels in Manila, focusing on food waste. With the increasing importance of environmental concerns and the hospitality industry's significant contribution to food waste, this study aims to identify and analyze types of edible food waste products as well as waste prevention methods, using data collected from 180 food handlers in hotels. The findings reveal that 1 to 5 kg of edible food waste is usually produced each day during preparation and cooking. The employment of untrained personnel is a primary factor contributing to the generation of excessive food waste. Donation is a common method for reducing food waste, but recycling is less prevalent. Regulation of portion sizes is hardly practiced. This research contributes to sustainable food waste management in the hospitality industry offering a foundation for future studies focusing on the inventory of edible food waste and effective prevention methods.

Keywords: Food waste, causes, practices, food handler, food production, edible food

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Introduction

Food waste represents a significant challenge to achieving Sustainable Development Goal 12.3, which aims to reduce global food waste by 2030. Food waste occurs due to stringent quality standards, inadequate purchase planning, overbuying, and overcooking (Gustavsson et al., 2011). In one study, the depletion of biodiversity, the squandering of 250 cubic kilometers of water, and the wastage of 30% of the world's agricultural land was attributed to global food waste (Wong et al., 2022). The

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primary impacts of global food waste are the exacerbation of global warming and the release of greenhouse gases (Fuchs & Konar, 2025; Konar et al., 2024; Rohini et al., 2020).

Restaurants frequently employ the strategy of using modest portions of food supplies to reduce food waste. However, the practice of segregating waste was rarely observed in these establishments (Cuevas et al., 2020; Lee et al., 2018; Sun et al., 2025). On the other hand, some hotels have implemented green donations as a prerequisite to being classified as "green hotels" that implement green practices (Obilor, 2023).

Consumer food waste rates vary significantly, with unit waste levels (measured in kg cap^{-1} day^{-1} or kg cap^{-1} $meal^{-1}$) differing in magnitude (Putra et al., 2023). It is noteworthy that both less affluent and super-rich countries/regions experience food waste at both very high and very low rates, respectively. This suggests that efforts to significantly decrease consumer food waste on a global scale should involve all segments of societies (Dou & Toth, 2021).

A study conducted on Malaysia's foodservice sector revealed that a considerable amount of food (16–28%) was wasted. Furthermore, nearly half of this waste (49% of total food waste) was avoidable, meaning it could have been prevented. This food waste resulted in a significant economic loss, accounting for nearly 23% of the value of the food that was bought. The overwhelming portion comprised of kitchen waste from food preparation. Next, are waste from buffets followed by plate waste from customers. Some restaurant protocols and guidelines also resulted in the systematic generation of food waste. Food waste is also attributed to social practices associated with food intake (Papargyropoulou et al., 2019; Yan, Konar, Balasubramanian et al., 2025; Yan, Konar, Sthapit et al., 2025).

The lack of comprehensive investigations into the management of edible food waste in Manila hotels highlights the pressing need for this study. It seeks to fill this gap by documenting edible food waste, evaluating its prevention methods, and offering valuable insights to inform future endeavors in reducing and managing food waste in the hotel industry (Balasubramanian et al., 2022; Bhutia & Konar, 2024). In this regard, the main objective of this study is to conduct a comprehensive analysis and inventory of the edible food waste produced by hotels in Manila. The specific emphasis is on determining the amount, variety, and causes of disposal as well as ways to prevent it.

Thus, the research aims to:

1. Identify the top five edible wastes from food production in selected hotels in Manila.
2. Determine the volume of edible waste produced daily by selected hotels in Manila.

3. Understand better the significant relationship between the demographic profile of the respondents to the causes of food waste as well as the reduction and prevention practices that have been implemented

Literature Review

Food Waste

Hotels produce 0.86 kg of food waste per visitor each day. A recent survey discovered that the most significant source of waste, accounting for 50% of all trash, was waste produced during food preparation (Ozanne et al., 2022). Another estimated 30% to 40% of all food produced is wasted at the consumer level, contributing significantly to overall food waste (Gatto & Chepeliev, 2024). Over 1.3 billion tons of food are lost or wasted annually, or nearly one-third of all food produced worldwide is lost or wasted, mainly during the production, post-harvest, and processing stages (Ogedengbe et al., 2022).

The hotel industry has implemented various strategies to address food waste, including measures to prevent food waste on the premises, donating unconsumed food to those in need, recycling and composting leftovers, raising awareness among staff members, promoting environmental-friendly practices, utilizing technology to manage food waste, and launching campaigns or programs to educate consumers about the impact of food waste (Samsuddin et al., 2022).

The study framework and methodology for this study was supported by a thorough evaluation of the existing literature. Moreover, the study also hopes to guide hospitality managers in comprehending the primary factors that contribute to the generation of food waste as well as potential opportunities and challenges. Academics and industry professionals can enhance and improve this framework for wider adoption in the hospitality sector. Future studies can also tailor the framework to work for many sorts of hospitality enterprises. For instance, in upscale dining, the quantity of food waste generated during the cooking process, especially in the kitchen, is more significant than the amount of food waste created by consumers. This is attributed to the use of more advanced culinary methods and presentation approaches, as well as the adoption of reduced portion sizes (Filimonau & Delysia, 2019).

Food Waste Management

Food waste reduction can significantly impact the environment by lowering greenhouse gas emissions and saving water and land resources. Further, the reduction of food waste also presents financial advantages, such as lower food costs and higher profitability for food companies. This necessitates a comprehensive strategy that

incorporates interventions, including education, incentives, and technological solutions (Swetha et al., 2024).

Improving infrastructure and technological innovations for food production, storage, and transportation is one way to reduce food loss and waste. Other methods include reducing food waste at the consumer and retail level through education and awareness campaigns and promoting policies and incentives that support sustainable food systems (WHO & FAO, 2018). At the household level, initiatives to minimize food waste should concentrate on enhancing food management practices, fostering awareness and education about food waste, and providing the necessary tools and resources (Aires et al., 2021).

Food handlers' attitudes toward food waste reduction are determined by their level of awareness, education, and motivation. Improving training programs and education can enhance the attitude and knowledge of food handlers toward reducing food waste. Food handlers motivated to reduce food waste frequently develop more original and inventive waste-reduction strategies. Portion management, appropriate labeling, storage, and donating extra food to charities are popular practices food handlers use to avoid food waste (Vargas-Lopez et al., 2022).

Causes of Food Waste

Food waste mostly happens at the retail and consumer level, during the production, storage, and transportation stages (WHO & FAO, 2018). At the consumer level, overspending, misunderstanding expiration dates, and over-preparation are the main contributors of food waste (W. H. Zhang et al., 2019). The main contributors to household food waste include poor food management habits like overspending, over-preparation, and failure to consume food quickly enough. Age, family size, and income are further socio-demographic factors that contribute to food waste whereby larger families and higher incomes are linked to increased food waste. The amount of food waste generated in households is also influenced by attitudes and practices such as methods for reducing food waste, understanding food waste, and environmental concerns (Berjan et al., 2021).

The logistics and supply chain management sectors are mostly to blame for food waste at the supplier-retailer interface, including erroneous forecasting and ordering, excess production, and ineffective transit and storage. Client preferences and quality requirements that lead to the rejection of still edible food products are additional variables that contribute to food waste (Haji et al., 2022). According to Z. Zhang et al. (2019), Chinese hotel food handlers contribute significantly to food waste, in particular, inexperienced food sector workers are more prone to produce food waste than experienced ones. Other habits of food handlers such as over-portioning and improper storage also cause food waste in hotels.

The Resource-Based View Theory

The study is grounded on the Resource-Based View (RBV) theory, which is highly relevant in the context of hotel performances based on effective utilization of capabilities and internal resources. Food inventory, staff competencies and operational procedures form strategic resources that influence operational effectiveness. Food waste is therefore not only an environmental concern but also an indicator of inefficient resource management. When a hotel discards or overproduces consumable food, they fail to extract optimal value, resulting in financial loss, reduced sustainability performance and purchased inputs. Therefore, minimizing food waste can be regarded as the development of an organizational capability that improves both efficiency and competitive advantage.

Methodology

Research Design

Descriptive quantitative research was used to analyze data to determine respondents' demographic profiles and the motivations that guide selected hotels in reducing food wastage. Correlational analysis was also done to understand the relationship between demographics and the causes and practices of food wastage.

Research Instrument

The research tool employed was a survey questionnaire which was constructed using established indicators and validated variables derived from pertinent literature. Additionally, Cronbach's Alpha was calculated to assure the study instrument's validity and reliability. Consequently, 30 responses were received for one of the "open-ended" question in the survey questionnaire.

Indicators for quantifying food waste were derived from various studies. These studies identified two key factors influencing the amount of food waste generated during food service, that is, attendance rate of guests at events and quantity of dishes served (Islam et al., 2025; Konar et al., 2025; Zrnić et al., 2022).

The study utilized purposive sampling to select food handlers from several hotels in Manila as respondents. Purposive sampling allows the researcher to selectively choose participants based on their relevance to the study's research topic or phenomenon, thus giving the researcher control over the selection process.

Data Collection

A research instrument, in the form of a survey questionnaire, validated and pretested, was used to collect pertinent data on food waste management procedures in hotels. A criterion was created to ascertain the direct involvement of respondents

in food handling activities. A total of 180 respondents who met the specified criteria were selected to take part in the survey. Respondents were guaranteed that their involvement was voluntary and that their responses would be kept confidental.

Data Analysis

SPSS version 25.0 was used to analyze all the collected data. Descriptive statistics (mean, standard deviation, frequency) was calculated for all the variables. The Shapiro-Wilk test was used to determine whether the data were normal while parametric tests were performed for additional analysis because the data were normally distributed.

The post-test results were compared between three groups (experimental group 1, experimental group 2, and control group) using a one-way analysis of variance (ANOVA). After that, the Tukey HSD test was used in post-hoc comparisons to see which groups differed noticeably.

Multiple regression analysis was conducted to examine the association between the dependent variable (cause and practices) and the independent variable (demographic profile). For all statistical analyses, $p = 0.05$ was chosen as the significance threshold.

Results

Common Edible Food Waste

Table 1 shows the common edible food waste from food preparation and cooking disposed off in a day. The predominant quantity was 1–5 kilos with bruised vegetable forming the highest percentage of food waste (77.2%), and leftover food, the lowest (54%).

Table 1. Summary of common edible food waste disposed off in a day (kg)

Common edible food waste	Weight (kg)	Frequency (n=180)	Percentage (%)
Leftover food	1–5	81	45.0
	6–10	71	39.4
	11–15	27	15.0
	16–20	1	6
Overripe fruits	1–5	110	61.1
	6–10	40	22.2
	11–15	0	0.0
	16–20	30	16.7
Potato peels	1–5	127	70.6
	6–10	53	29.4
	11–15	0	0.0
	16–20	0	0.0

Table 1. (con't)

Common edible food waste	Weight (kg)	Frequency (n=180)	Percentage (%)
Carrot peels	1–5	127	70.6
	6–10	51	28.3
	11–15	2	1.1
	16–20	0	0.0
Cucumber peels	1–5	132	73.3
	6–10	46	25.6
	11–15	2	1.1
	16–20	0	0.0
Bruised vegetables	1–5	139	77.2
	6–10	38	21.1
	11–15	3	1.7
	16–20	0	0.0
Fat trimmings	1–5	103	57.2
	6–10	70	21.1
	11–15	7	3.9
	16–20	0	0
Expired food	1–5	127	70.6
	6–10	51	28.3
	11–15	2	1.1
	16–20	0	0.0

Causes of Food Waste

Table 2 shows all the identified causes for food waste, as experienced by the respondents, whereby food safety received a mean of 1.38 (rarely experienced) while unskilled staff obtained the highest mean of 4.05 (often experienced).

Table 2. Respondents' assessment of food waste cause as experienced

Cause	Mean	Experience
Food ingredient is inefficiently produced	3.54	Often
The quantity of ingredients estimated is inappropriate	3.63	Often
Food safety is practiced	1.38	Rarely
The policy is not communicated	3.57	Often
Unskilled staff	4.05	Often

Note: Never (1.00 – 1.50), Rarely (1.51 – 2.50), Sometimes (2.51 – 3.50), Often (3.51 – 4.50), Always (4.51 – 5.00)

Practices to Reduce and Prevent Food Waste

Table 3 lists the practices done to reduce food waste in hotels. Common practices include donation of surplus food (mean of 4.39), recycling of food waste (mean of 3.09), composting of food waste (mean of 3.03) and tracking of food waste (mean of 2.87). The rare practices include purchase of quality ingredients (mean of 1.76), well-planned menu (mean of 1.53) and proper storage of raw ingredients (mean of 1.26) while portion control (mean of 1.21) was never practiced.

Wani et al. (2024) claimed that the recovery of food waste is a growing concern since it has the potential to assist the economy and the environment. Some of the more popular sustainable methods for recovering food waste are composting, anaerobic digestion, and insect farming. Whereas anaerobic digestion employs microorganisms to break down food waste in an oxygen-free environment and produce biogas, composting involves the aerobic decomposition of food waste. Insect farming includes feeding insects, like black soldier flies, food waste. These insects can subsequently be used as a source of protein for fertilizer or animal feed.

Table 3. Practices to reduce and prevent food waste

Practice	Mean	Verbal Interpretation
Well-planned menu	1.53	Rarely
Purchase of quality ingredients	1.76	Rarely
Proper storage of raw ingredients	1.26	Rarely
Portion control	1.21	Never
Tracking of food waste	2.87	Sometimes
Recycling of food waste	3.09	Sometimes
Donation of surplus food	4.39	Always
Composting of food waste	3.03	Sometimes

Note: Never (1.00 – 1.50), Rarely (1.51 – 2.50), Sometimes (2.51 – 3.50), Often (3.51 – 4.50), Always (4.51 – 5.00).

Perception of Food Waste Causes by Age

Table 4 shows the perception of food waste causes according to the age of the respondents. For example, quantity of ingredients estimated inaccurately, and hiring of unskilled staff were perceived as significant.

Table 4. One-Way Analysis of Variance (ANOVA): Differences in perceived causes by age

Cause	f-value	p-value	Decision	Remarks
Food ingredients are inefficiently produced	0.884	0.506	Accept H_o	Not Significant
Quantity of ingredients are estimated inaccurately	8.2	0.000	Reject H_o	Significant
Food safety is practiced	1.280	.275	Accept H_o	Not Significant
Policy is not communicated	0.203	0.212	Accept H_o	Not Significant
Hiring of unskilled staff	2.556	0.002	Reject H_o	Significant

Note: If p-value is less than or equal to the level of significance (0.05), then H_o is rejected, otherwise, it has failed to reject H_o.

Perception of Food Waste Causes by Gender

Table 5 shows the perception of food waste causes according to the gender of the respondents. Results show that quantity of ingredients estimated inaccurately was significantly perceived.

Table 5. One-Way Analysis of Variance (ANOVA): Differences in perceived causes by gender

Cause	f-value	p-value	Decision	Remarks
Food ingredients are inefficiently produced	0.096	0.758	Accept H_o	Not Significant
Quantity of ingredients estimated inaccurately	6.46	0.12	Reject H_o	Significant
Food safety is practiced	1.45	.299	Accept H_o	Not Significant
Policy is not communicated	0.135	0.714	Accept H_o	Not Significant
Hiring of unskilled staff	1.57	0.211	Accept H_o	Not Significant

Note: If p-value is less than or equal to the level of significance (0.05), then H_o is rejected, otherwise, it has failed to reject H_o.

Perception of Food Waste Causes by Civil Status

Table 6 shows the perception of food waste causes according to the civil status of the respondents. Food ingredients are inefficiently produced and food safety is practiced were significantly identified as the causes of food waste that the food handlers experienced.

Table 6. One-Way Analysis of Variance (ANOVA): Differences in perceived causes by civil status

Cause	f-value	p-value	Decision	Remarks
Food ingredients are inefficiently produced	5.39	0.021	Reject H_o	Significant
Quantity of ingredients estimated inaccurately	6.47	1.06	Accept H_o	Not Significant
Food safety is practiced	1.45	.016	Reject H_o	Significant
Policy is not communicated	0.135	0.167	Accept H_o	Not Significant
Hiring of unskilled staff	1.57	0.284	Accept H_o	Not Significant

Note: If p-value is less than or equal to the level of significance (0.05), then H_o is rejected, otherwise, it has failed to reject H_o.

Perception of Food Waste Causes by Educational Attainment

Table 7 shows the perception of food waste causes according to the educational attainment of the respondents. Quantity of ingredients estimated inaccurately was identified as the significant cause of food waste in relation to the respondents' educational attainment.

Table 7. One-Way Analysis of Variance (ANOVA): Differences in perceived causes by educational attainment

Cause	f-value	p-value	Decision	Remarks
Food ingredients are inefficiently produced	.078	.781	Accept H_o	Not Significant
Quantity of ingredients estimated inaccurately	8.42	.004	Reject H_o	Significant
Food safety is practiced	.366	.546	Accept H_o	Not Significant
Policy is not communicated	1.48	.225	Accept H_o	Not Significant
Hiring of unskilled staff	7.22	.008	Accept H_o	Not Significant

Note: If p-value is less than or equal to the level of significance (0.05), then H_o is rejected, otherwise, it has failed to reject H_o.

Perception of Food Waste Causes by Years of Service

Table 8 shows that based on years of service, all the listed ones were identified as causes of food waste except policy is not communicated.

Table 8. One-Way Analysis of Variance (ANOVA): Differences in perceived causes by years of service

Cause	f-value	p-value	Decision	Remarks
Food ingredients are inefficiently produced	2.67	.017	Reject H_o	Significant
Quantity of ingredients estimated inaccurately	9.60	.000	Reject H_o	Significant
Food safety is practiced	9.11	.000	Reject H_o	Significant
Policy is not communicated	1.57	.158	Accept H_o	Not Significant
Hiring of unskilled staff	4.41	.000	Reject H_o	Significant

Note: If p-value is less than or equal to the level of significance (0.05), then H_o is rejected, otherwise, it has failed to reject H_o.

Perception of Food Waste Reduction and Prevention Practices by Age

Table 9 shows that well-planned menu, purchase of quality ingredients, portion control, recycling of food waste, donation of surplus food, and composting of food waste, were all significantly perceived as practices to reduce food waste in relation to the age of the respondents.

Table 9. One-Way Analysis of Variance (ANOVA): Differences in perceived food waste reduction and prevention practices by age

Practice	f-value	p-value	Decision	Remarks
Well-planned menu	6.99	.000	Reject H_o	Significant
Purchase of quality ingredients	5.20	.000	Reject H_o	Significant
Proper storage of raw ingredients	.960	.444	Accept H_o	Not Significant
Portion control	7.15	.000	Reject H_o	Significant
Tracking of food waste	2.15	.062	Accept H_o	Not Significant
Recycling of food waste	5.13	.000	Reject H_o	Significant
Donation of surplus food	4.56	.001	Reject H_o	Significant
Composting of food waste into organic waste	4.15	.001	Reject H_o	Significant

Note: If p-value is less than or equal to the level of significance (0.05), then H_o is rejected, otherwise, it has failed to reject H_o.

Perception of Food Waste Reduction and Prevention Practices by Gender

Table 10 shows that well-planned menu, portion control, recycling of food waste, and donation of surplus food were identified as practices of reduction and prevention of food waste in relation to the gender of the respondents.

Table 10. One-Way Analysis of Variance (ANOVA): Differences in perceived food waste reduction and prevention practices by gender

Practice	f-value	p-value	Decision	Remarks
Well-planned menu	4.85	.029	Reject H_o	Significant
Purchase of quality ingredients	.060	.806	Accept H_o	Not Significant
Proper storage of raw ingredients	.104	.747	Accept H_o	Not Significant
Portion control	22.40	.000	Reject H_o	Significant
Tracking of food waste	.015	.904	Accept H_o	Not Significant
Recycling of food waste	5.68	.018	Reject H_o	Significant
Donation of surplus food	9.64	.002	Reject H_o	Significant
Composting of food waste into organic waste	2.14	.145	Accept H_o	Not Significant

Note: If p-value is less than or equal to the level of significance (0.05), then H_o is rejected, otherwise, it has failed to reject H_o.

Perception of Food Waste Reduction and Prevention Practices by Civil Status

Table 11 shows that portion control, and donation of surplus food were identified as practices to reduce and prevent food waste in relation to the civil status of the respondents.

Table 11. One-Way Analysis of Variance (ANOVA): Differences in perceived food waste reduction and prevention practices by civil status

Practice	f-value	p-value	Decision	Remarks
Well-planned menu	4.85	.029	Accept H_o	Not Significant
Purchase of quality ingredients	.060	.806	Accept H_o	Not Significant
Proper storage of raw ingredients	.104	.747	Accept H_o	Not Significant
Portion control	22.40	.000	Reject H_o	Significant
Tracking of food waste	.015	.904	Accept H_o	Not Significant
Recycling of food waste	5.68	.018	Accept H_o	Not Significant
Donation of surplus food	9.64	.002	Reject H_o	Significant
Composting of food waste into organic waste	2.14	.145	Accept H_o	Not Significant

Note: If p-value is less than or equal to the level of significance (0.05), then H_o is rejected, otherwise, it has failed to reject H_o.

Perception of Food Waste Reduction and Prevention Practices by Educational Attainment

Table 12 shows that all the identified reduction and prevention practices of food waste were not perceived significantly in relation to the educational attainment of the respondents.

Table 12. One-Way Analysis of Variance (ANOVA): Differences in perceived food waste reduction and prevention practices by educational attainement

Practice	f-value	p-value	Decision	Remarks
Well-planned menu	2.49	.116	Accept H_o	Not Significant
Purchase of quality ingredients	1.53	.217	Accept H_o	Not Significant
Proper storage of raw ingredients	.743	.390	Accept H_o	Not Significant
Portion control	1.36	.245	Accept H_o	Not significant
Tracking of food waste	1.92	.167	Accept H_o	Not Significant
Recycling of food waste	2.28	.132	Accept H_o	Not Significant
Donation of surplus food	.464	.497	Accept H_o	Not Significant
Composting of food waste into organic waste	.032	.857	Accept H_o	Not Significant

Note: If p-value is less than or equal to the level of significance (0.05), then H_o is rejected, otherwise, it has failed to reject H_o.

Perception of Food Waste Reduction and Prevention Practices by Years of Service

Table 13 shows that all the identified practices of reduction and prevention of food waste except purchase of quality ingredients have been significantly perceived in relation to years of service.

Table 13. One-Way Analysis of Variance (ANOVA): Differences in perceived food waste reduction and prevention practices by years of service

Practice	f-value	p-value	Decision	Remarks
Well-planned menu	12.70	.000	Reject H_o	Significant
Purchase of quality ingredients	13.94	.806	Accept H_o	Not Significant
Proper storage of raw ingredients	.104	.000	Reject H_o	Significant
Portion control	3.96	.001	Reject H_o	Significant
Tracking of food waste	3.62	.002	Reject H_o	Significant
Recycling of food waste	8.42	.000	Reject H_o	Significant

Table 13. (con't)

Practice	f-value	p-value	Decision	Remarks
Donation of surplus food	9.64	.000	Reject H_o	Significant
Composting of food waste into organic waste	8.63	.000	Reject H_o	Significant

Note: If p-value is less than or equal to the level of significance (0.05), then H_o is rejected, otherwise, it has failed to reject H_o.

Discussion

Based on the findings, about 1–5 kg of food waste was produced by the selected hotels on a daily basis. Bruised vegetables topped the list of common food waste, which implies that food handlers adhere to standard quality requirements to produce quality food. However, findings also show that food safety regulations are not often followed, which might lead to food waste.

The findings also show that the respondents' years of service has a significant relation to understanding food waste causes and practices to reduce or prevent it as implemented by selected hotels. On the other hand, practices for food waste reduction and prevention was found to have no significant relationship to the educational attainment of the respondents. The findings align with Ghani et al. (2025) as well as Ruby and Ungku Zainal Abidin (2022), who contended that food handlers' attitude toward food waste reduction is determined by their level of awareness, education, and motivation. Thus, educational and training programs can considerably enhance the attitudes and knowledge of food handlers toward reducing food waste.

Food handlers who are motivated to reduce food waste frequently develop more original and inventive waste-reduction strategies. Portion management, appropriate labeling, good storage, and donation of surplus food to charities are popular practices used by food handlers to avoid food waste. The demographics of food handlers such as years of service play a role in efforts to effectively reduce food waste, as shown by the results.

Further, customized interventions and training programs are crucial to promote sustainable practices and minimize waste generation in the hospitality business. Hotels can achieve significant and lasting progress towards sustainability by taking into account the varied origins, experiences, and attitudes of their staff members and customizing training or educational programs for them.

Inexperienced food handlers can contribute significantly to hotel food waste. Thus, training programs should concentrate on targeting behaviours to cut waste. The study also emphasizes how crucial monitoring and feedback systems are in supporting the collaboration and communication across various hotel departments to decrease food waste. Thus, the study recommends greater cooperation and

collaboration between hoteliers, suppliers, and patrons towards this goal (Liu et al., 2026).

The findings also recommend a holistic plan in hotels to address issues such as minimizing overproduction, portion management, and the reuse of food leftovers to reduce food waste. All staff members should receive proper instructions on preparing, storing, and discarding food. They should also be educated about decreasing food waste and the best ways to achieve it. Hotels can also use technology such as inventory management systems to track food waste and spot areas for improvement.

This study offers empirical insights into the present practices and problems of edible food waste management in the Manila region through a survey of 180 food handlers from selected hotels. The findings provide insights into the amount, categories, and causes of food waste, along with suitable practices for its reduction in the hospitality industry. Consistent with the Resource-Based View theory, food waste is not merely an environmental issue but is also a reflection of organizational capability. Hotels with better operational coordination demonstrate stronger resource efficiency.

The practical implications of this study include encouraging sustainable practices and waste reduction initiatives in the hospitality business. Hotels in Manila can minimize waste, reduce environmental impact, and promote operational efficiency by increasing awareness of food waste and identifying opportunities, to implement and improve evidence-based initiatives.

Conclusion

The study conducted a survey with 180 food handlers to get insights into the amount, categories, and causes of food waste. The study also examined how demographic factors influence food waste and practices to reduce and prevent food waste. Damaged vegetables was the predominant form of food waste generated by hotels in Manila. This observation suggests the cause can be attributed to the adherence of strict requirements for high-quality products and also non-compliance of food safety procedures. Thus, food waste can be reduced by enhancing protocols for handling and storing food.

Another crucial suggestion for decreasing waste in the hospitality industry is to give priority to training and awareness initiatives for staff who are directly involved in food handling and storage methods. Equipped with the necessary information and skills to prevent raw ingredient bruising and spoilage, hotels may reduce waste at its origin and enhance overall operational efficiency.

The findings establish a basis for future research efforts and present practical suggestions for stakeholders aiming to improve sustainability practices in the hospitality industry in Manila.

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References

Aires, C., Saraiva, C., Fontes, M. C., Moreira, D., Moura-Alves, M., & Gonçalves, C. (2021). Food waste and qualitative evaluation of menus in public university canteens—Challenges and opportunities. *Foods, 10*(10), 2325.

Balasubramanian, K., Konar, R., Tul-Krzyszczuk, A., & Launer, M. (2022). Digital trust in the hotel industry: An international customer/supplier perspective. In J. Paliszkiewicz, K. Chen, & M. Launer (eds), *Trust and digital business: Theory and practice* (pp. 137–147). Routledge. https://doi.org/10.4324/9781003266525-13

Berjan, S., Vaško, Ž., Ben Hassen, T., El Bilali, H., Allahyari, M. S., Tomić, V., & Radosavac, A. (2021). Assessment of household food waste management during the COVID-19 pandemic in Serbia: A cross-sectional online survey. *Environmental Science and Pollution Research, 29*, 11130–11141. https://doi.org/10.1007/s11356-021-16485-8

Bhutia, L. D., & Konar, R. (2024). Empowering women through the lost art of thangka painting and cultural tourism in Sikkim, India. In G. E. Bayram, A. T. Bayram, & M. Sak (eds), *Empowering women through rural sustainable development and entrepreneurship* (pp. 201–216). IGI Global. https://doi.org/10.4018/979-8-3693-6572-4.ch010

Cuevas, J. C. B., Indicio, M. J. M., Reyeg, M. J. S., & Mandigma Jr, E. C. (2020). Green practices of selected restaurants in Solenad, Nuvali in Sta. Rosa Laguna, Philippines. *IOER International Multidisciplinary Research Journal, 2*(3), 89–98.

Dou, Z., & Toth, J. D. (2021). Global primary data on consumer food waste: Rate and characteristics–A review. *Resources, Conservation and Recycling, 168*, 105332.

Filimonau, V., & Delysia, A. (2019). Food waste management in hospitality operations: A critical review. *Tourism Management, 71*, 234–245.

Fuchs, K., & Konar, R. (2025). The action–attitude gap to pro-environmental sustainability in nature-based destinations: A qualitative study using stakeholder theory. *Tourism, 73*(2), 204–214. https://doi.org/10.37741/t.73.2.1

Gatto, A., & Chepeliev, M. (2024). Global food loss and waste estimates show increasing nutritional and environmental pressures. *Nature Food, 5*(2), 136–147.

Ghani, B., Zada, M., Lohana, M. K., Memon, K. R., Salameh, A. A., & Contreras-Barraza, N. (2025). Impact of environmental training, awareness, and green values on sustainable food waste management. *Scientific Reports, 15*(1), 37572.

Gustavsson, J., Cederberg, C., Sonesson, U., Van Otterdijk, R., & Meybeck, A. (2011). *Global food losses and food waste: Extent, causes and prevention. Study conducted for the International Congress Save Food!* FAO.

Haji, M., Kerbache, L., & Al-Ansari, T. (2022). Food quality, drug safety, and increasing public health measures in supply chain management. *Processes, 10*(9), 1715.

Islam, M. T., Pandey, U., Konar, R., & Bansal, S. (2025). What motivates tourists to take wildlife selfies? Evidence from wildlife tourist attractions in India. *Journal of Tourism and Development, 48*, 391–415. https://doi.org/10.34624/rtd.v48i0.35141

Konar, R., Islam, M. T., Bhutia, L., & Seal, P. P. (2025). Linking green technologies and sustainable infrastructure for transformative events and festivals in Malaysia. In A. Sharma, J. Kumar, & S. Arora (eds), *Technological innovation and AI for sustainable development in events and festivals* (pp. 213–225). CABI. https://doi.org/10.1079/9781836990185.0017

Konar, R., Islam, M. T., Kumar, J., & Bhutia, L. D. (2024). Empowering tourists through technology: Co-creative destination experiences in the Malaysian tourism sector. In A. Albattat, N. Azman, M. Valeri, & A. Singh (eds), *Tracking tourism patterns and improving travel experiences with innovative technologies* (pp. 135–151). IGI Global. https://doi.org/10.4018/979-8-3693-9636-0.ch006

Lee, G. W. M., Rajaratnam, S. D., & Konar, R. (2018). Key attributes of Malaysian specialty coffee shops: An exploratory investigation. *Asia-Pacific Journal of Innovation in Hospitality and Tourism, 7*(2), 69–83.

Liu, Y., Subramaniam, T., Konar, R., Fuchs, K., Kunasekaran, P., & Ragavan, N. A. (2026). Community resident and sustainable cultural heritage tourism development: A systematic literature review using PRISMA. *Tourism, 74*(1), 95–112. https://doi.org/10.37741/t.74.1.6

Obilor, E. I. (2023). Convenience and purposive sampling techniques: Are they the same. I*nternational Journal of Innovative Social & Science Education Research, 1*1(1), 1–7.

Ogedengbe, T. C., Malomo, O. J., & Akanji, N. E. (2022). Post-harvest losses and reduction techniques in crop production: A review. *The Journal of Agricultural Education and Extension, 12*(4), 225–223.

Ozanne, L. K., Ballantine, P. W., & McMaster, A. (2022). Understanding food waste produced by university students: A social practice approach. *Sustainability, 14*(17), 10653.

Papargyropoulou, E., Steinberger, J. K., Wright, N., Lozano, R., Padfield, R., & Ujang, Z. (2019). Patterns and causes of food waste in the hospitality and food service sector: Food waste prevention insights from Malaysia. *Sustainability, 11*(21), 6016.

Putra, G. A. A., Bagiastuti, N. K., Astuti, N. N. S., Suparta, I. K., & Suja, I. K. (2023). Analysis of green practices implementation at FourStar by Trans Hotel Restaurant. *International Journal of Glocal Tourism, 4*(1), 35–41.

Rohini, C., Geetha, P. S., Vijayalakshmi, R., Mini, M. L., & Pasupathi, E. (2020). Global effects of food waste. *Journal of Pharmacognosy and Phytochemistry, 9*(2), 690–699.

Ruby, G. E., & Ungku Zainal Abidin, U. F. (2022). A systematic literature review of assessing the level of food safety knowledge among food handlers in Malaysia. In Khairatun, S. N., Abu Bakar, A. Z., Abdul Mutalib, N. A., & Ungku Zainal Abidin, U. F. (Eds.), *Food safety practices in the restaurant industry* (pp. 151–171). IGI Global Scientific Publishing.

Samsuddin, Z., Zainal, N. A. M., Sulong, S. N., & Bakar, A. M. F. A. (2022). Handling food waste in the hotel industry. *Malaysian Journal of Social Sciences and Humanities (MJSSH), 7*(11), e001926-e001926.

Sun, Y., Konar, R., & Wei, C. K. (2025). Unlocking the power of employee advocacy: The role of internal communication and engagement in five-star hotels. *International Journal of Hospitality Management, 126*, 104086. https://doi.org/10.1016/j.ijhm.2025.104086

Swetha, B. S., Prabhakar, I., & Ainapur, S. D. (2024). Food waste reduction and sustainable food systems: Strategies, challenges, and future directions. *Journal of Scientific Research and Reports, 30*(5), 328–336.

Vargas-Lopez, A., Cicatiello, C., Principato, L., & Secondi, L. (2022). Consumer expenditure, elasticity and value of food waste: A quadratic almost ideal demand system for evaluating changes in Mexico during COVID-19. *Socio-Economic Planning Sciences, 82*, 101065.

Wani, N. R., Rather, R. A., Farooq, A., Padder, S. A., Baba, T. R., Sharma, S., Mubarak, N. M., Khan, A. H., Singh, P., & Ara, S. (2024). New insights in food security and environmental sustainability through waste food management. *Environmental Science and Pollution Research International, 31*(12), 17835–17857. https://doi.org/10.1007/s11356-023-26462-y

Wong, M. H., Purchase, D., & Dickinson, N. (2022). Impacts, management and recycling of food waste: Global emerging issues. In D. Purchase & N. Dickinson (eds), *Food waste valorisation: Food, feed, fertiliser, fuel and value-added products* (pp. 3–31). World Scientific.

World Health Organization (WHO) & the Food and Agriculture Organization of the United Nations (FAO).(2018). *Report of the 11th FAO/WHO Joint Meeting on Pesticide Management*. FAO and WHO.

Yan, Z., Konar, R., Balasubramanian, K., Chen, L., & Wei, Y. (2025). Smart hotel in the eyes of the silver: Developing and testing the silver tourists' behavioural intention scale. *Current Issues in Tourism, 28*(19), 3128–3147. https://doi.org/10.1080/13683500.2024.2381249

Yan, Z., Konar, R., Sthapit, E., Balasubramanian, K., Chen, L., & Prentice, C. (2025). Opting for smart hotels: Do digital immigrants perceive differently than digital natives do? *Journal of Hospitality and Tourism Insights, 8*(7), 2447–2464. https://doi.org/10.1108/JHTI-08-2024-0785

Zhang, W. H., Sun, R. B., Xu, L., Liang, J. N., Wu, T. Y., & Zhou, J. (2019). Effects of micro-/nano-hydroxyapatite and phytoremediation on fungal community structure in copper contaminated soil. *Ecotoxicology and Environmental Safety, 174*, 100–109.

Zhang, Z., Han, W., Chen, X., Yang, N., Lu, C., & Wang, Y. (2019). The life-cycle environmental impact of recycling of restaurant food waste in Lanzhou, China. *Applied Sciences, 9*(17), 3608.

Zrnić, M., Gajić, T., Vukolić, D., & Čavić, S. (2022). Managing and minimizing food waste in the hospitality industry. *Hotel Link, 1*(2), 73–84.