Information Management and Business Review (ISSN 2220-3796)
Vol. 17, No. 1(S), pp. 58-67, March 2025

From Table to Trash: Behavioral Insights into Food Waste in Klang Valley Restaurants

Suraya Azmi[1], Siti Nur Aisyah Abdullah[2], *Noorazlin Ramli[3], Fatimah Abd Ghani[3], Yusnaidi[4]
[1]Beard Brothers BBQ, Tropicana Avenue, Petaling Jaya, Selangor, Malaysia
[2]Nando's Chickenland Malaysia Sdn Bhd 3, Subang Jaya, Selangor, Malaysia
[3]Faculty of Hotel and Tourism Management, Universiti Teknologi MARA, Cawangan Terengganu, Kampus Dungun, Malaysia
[4]Faculty of Economics, Universitas Teuku Umar, Meulaboh, Aceh, Indonesia
*noora115@uitm.edu.my
Corresponding Author: Noorazlin Ramli

Abstract: Food waste has significant environmental impacts and poses a major challenge for restaurant operations in the Klang Valley. To examine the elements of the Norm Activation Model (NAM) that influence consumer intentions to reduce food waste, a quantitative method was utilized to select 290 respondents. 290 valid responses were collected through face-to-face data distributions and an online questionnaire before being analyzed using the Statistical Package for the Social Sciences (SPSS). The study examines how personal norms (PN), ascription of responsibility (AR), and awareness of consequences (AC) influence personal norms (PN) and how personal norm (PN) influences intention (INT) to reduce food waste. Findings reveal that the intention to reduce food waste (INT) is significantly influenced by personal norms (PN), with awareness of consequences (AC) and ascription of responsibility (AR) both positively influencing personal norms (PN). These interventions align with the NAM model by increasing awareness, reinforcing responsibility, and shaping personal norms that encourage sustainable dining behaviors among consumers. Thus, the findings of the study benefit all key stakeholders, including restaurants, policymakers, and consumers, by advocating effective solutions to minimize food waste in the Klang Valley's restaurants**.**

Keywords: *Norm activation Theory (NAM), Personal Norm (PN), Awareness of Consequences (AC), Ascription of Responsibility (AR), Food Waste*

1. Introduction

Food waste constitutes a substantial global issue with extensive repercussions on economies, cultures, and the environment, as highlighted by concerning data. In 2019, an estimated 931 million tons of food were squandered globally, representing more than 17% of total food production (Shen et al., 2023; Jang & Ahn, 2024). Food waste not only impedes attempts to address food security but also significantly contributes to the exhaustion of resources and greenhouse gas emissions, worsening environmental concerns. (Sha'ari et al.). Food waste is a crucial issue in Malaysia, especially in the Klang Valley (Ariffin et al., 2023). Known for its vibrant culinary and restaurant scene, the Klang Valley faces substantial challenges in food waste control (Ariffin et al., 2023). The restaurant industry has experienced a rise in food waste generation due to the rapid urbanization and economic development in this metropolitan area, which has resulted in increased consumption patterns (Ariffin et al., 2023; Sha'ari et al., 2023).

The restaurant industry driven by customer behavior and operational practices, is a major contributor to food waste. Significant waste occurs due to overordering, incorrect portion sizes, and stringent quality standards (Sha'ari et al., 2023; Lin & Lee, 2024). It is crucial to have a better grasp on these issues to adopt successful solutions in mitigating food waste in restaurants. This research utilizes the Norm Activation Model (NAM), which asserts that individual behaviors are shaped by personal norms, awareness of consequences, and awareness of responsibility (Schwartz, 1977). Specifically, the study examines how ascription of responsibility (AR), awareness of consequences (AC) and personal norms (PN) influence customers' intentions (INT) to reduce food waste in restaurants (Wang et al., 2022; Iriyadi et al., 2023).

Notwithstanding comprehensive studies to minimize food waste, a significant gap in the comprehension of consumer behavior persists, especially within the realm of Klang Valley eateries. (Ariffin et al., 2023: Phooi et al., 2022). Most existing studies highlight household food waste, leaving a significant knowledge gap for restaurant-specific solutions (Phooi et al.., 2022; Kumar & Rathore, 2024). By providing useful information that can direct certain laws and regulations to sustainable practices in the restaurant business, this study seeks to

address this gap. Thus, this study examines how (PN), (AR), and (AC) influence (PN) and how (PN) influences (INT) to reduce food waste.

2. Literature Review

Norm Activation Model (NAM): The (NAM), introduced by Schwartz (1977), offers a framework for predicting prosocial behavior and exploring environmental intentions. NAM's key constructs are awareness of consequences (AC), ascription of responsibility (AR) and personal norms (PN), which shape an individual's behavior through internalized moral norms and social expectations (Kim and Seock, 2019; De Groot et al., 2021; Savari et al., 2023). As can be seen in Figure 1, both (AC) and (AR) have a direct and significant effect on (PN). (PN) are essential in motivating individuals to reduce food waste by fostering feelings of guilt about waste and raising awareness of environmental impacts (Ariestingsih et al., 2020; Wang et al., 2022). The study underscores the consistent influence of personal standards on intentions to reduce household food waste (Obuobi et al., 2023; Iriyadi et al., 2023). However, there are few empirical studies specifically applying NAM to understand restaurant food waste from customers' perspectives, highlighting a significant research gap and the need for further investigation in this area (Kim et al., 2022). This gap highlights the importance of study to clarify these links and guide actions aimed at fostering sustainable practices within the food business. Figure 2 illustrates the research framework adopted from Iriyadi et al. (2023).

Figure 1: 2 Direct Effect model of NAM

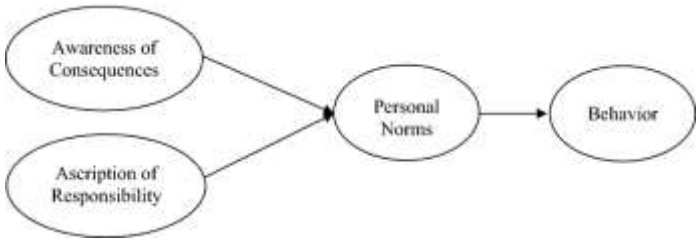
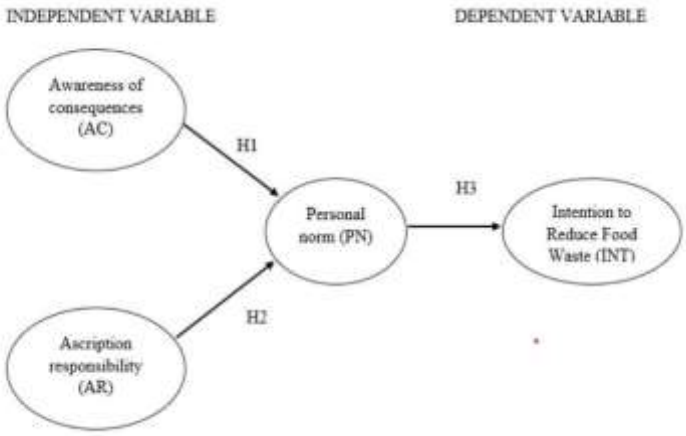


Figure 2: Research Framework



Iriyadi et al., (2023)

Intention to reduce food waste: Within the (NAM) framework, the intention to reduce food waste is influenced by several factors identified in recent studies. Awareness of the environmental and economic impacts of food waste significantly enhances people's intentions to act (Talwar et al., 2021). (PN), where individuals feel a moral obligation or personal responsibility to minimize waste, are crucial in motivating behaviors like meal planning and proper storage (Kim et al, 2022; Song et al., 2023). Social norms, including observing waste reduction behaviors and social expectations of responsible consumption, further reinforce

intentions towards sustainable practices (Chun T'ing et al., 2021). Through the integration of these facts, the NAM offers a comprehensive framework for understanding and encouraging goals to reduce food waste, therefore aiding broader sustainability initiatives within the restaurant industry.

Personal Norm (PN) and Consumer Intention (INT) to reduce food waste: Personal norm can be defined characterized as a moral obligations to specific acts (Schwartz, 1977). It significantly influences consumers' intentions (INT) to avoid wasting food in restaurants. Research indicates that when consumers view food waste reduction as a personal responsibility, they are more likely to have intentions aligned with this norm (Kim et al., 2022; Iriyadi et al., 2023). Studies indicate that personal norms strongly predict intentions to reduce food waste, highlighting the critical role of moral conviction and responsibility in consumer behavior (Obuobi et al., 2023; Song et al., 2023). Additionally, awareness of the consequences of food waste and a sense of responsibility are factors that shape personal norms and influence consumer intentions (Wang et al., 2022; Obuobi et al., 2023). This understanding is crucial for promoting behaviors that reduce food waste among consumers and highlights the psychological factors driving such behaviors (Jang & Kim, 2023). Consequently, the following hypothesis was articulated:
H1: (PN) significantly influence consumers' (INT).

Awareness of Consequences (AC) to Personal Norm (PN): Awareness of consequences for individual standards involves recognizing the negative impact of one's actions on others or valued entities, which fosters responsibility and altruism (Schwartz, 1977). This includes understanding how personal behavior affects the environment and social well-being, influencing ethical decision-making in a pro-environmental context (Iriyadi et al., 2023). This awareness encompasses the belief that individual actions can worsen existing problems, motivating people to act in ways that mitigate harm and adhere to moral principles (Setiawan et al., 2021; Wang et al., 2022). By connecting moral principles to behavior, awareness of consequences shapes personal norms and encourages behaviors that reduce food waste and promote environmental sustainability (Kim et al., 2022; Setiawan et al., 2021). Consequently, the following hypothesis was articulated:
H2: (AC) significantly influences consumers' (PN).

Ascription of Responsibility (AR) to Personal Norm (PN): Ascription of responsibility (AR) pertains to individuals' sense of duty regarding the adverse outcomes of failing to adopt environmentally sustainable behaviors (Wang et al., 2022). People are more likely to participate in waste reduction when they perceive a sense of responsibility (Munerah et al., 2021). A sense of responsibility influences personal norms and it is necessary for sustainable tourism (Long et al., 2022; Wang et al., 2022). Tourists' pro-environmental behaviors, such as reducing waste and staying in green hotels, are crucial for sustainability (Ritchie et al., 2022). Awareness of the effects of food waste encourages personal norms related to saving food (Wang et al., 2022). Ultimately, a strong sense of responsibility and personal norms significantly impact food waste reduction behavior (Kim et al., 2022; Aydin & Yildrim, 2021). Consequently, the following hypothesis was articulated:
H3: (AR) significantly influence consumer's (PN).

3. Methodology

Research Design and Population: This research uses a correlational research design within a quantitative framework to explore the relationships between variables without direct intervention. Quantitative methods were selected to generate numerical data and facilitate statistical analysis. The research focuses on consumers in Klang Valley, where the population is approximately one million. This population was chosen to investigate their intentions to reduce food waste at restaurants.

Sampling, Instrument Development, and Data Collection: This study adopted a purposive sampling technique. A sample size of 166 respondents was calculated using G*Power software, with over 290 hard copies and additional online questionnaires distributed to account for potential low response rates. This dual methodology will be executed in alignment with prior studies that employed both physical and digital survey forms to obtain comprehensive data for their analyses (Nelson et al., 2021). Klang Valley was selected according to Chun T'ing et al. (2021); food waste happens more often in cities with larger populations and evolving trends of dining out. Data collection occurred over two months using Google Forms and QR codes placed at licensed eateries. Only participants who had visited a restaurant in Klang Valley in the past month and intended to do

so in the future were included. Consequently, the target respondents for this research were Malaysian adults (aged 18 and above). The questionnaire was adapted from Iriyadi et al. (2023) and is available in English and Bahasa Melayu. It comprises six sections and measures responses using a five-point Likert scale. The Likert scale can provide additional information about the participants' perceptions of agreement towards a descriptive question, and it can show extensive insight into the analyzed results, which can further improve the objectivity of the study (Sekaran & Bougie, 2016). The estimated time for the respondents to finish the questionnaires was 15-20 minutes.

Data Analysis: For data analysis, SPSS version 26.0 was used in employing techniques such as reliability analysis, descriptive analysis, and Pearson correlation. Reliability testing showed satisfactory Cronbach's Alpha values for key constructs, ensuring internal consistency. Results underscore the reliability and validity of the data, enabling meaningful insights into consumers' intentions to reduce food waste.

4. Findings

The questionnaire data has been analyzed using SPSS (Statistical Package for Social Sciences) Version 27. The questionnaires were distributed to a total of 290 respondents using an online platform, specifically a Google Forms link. The questionnaire consists of five sections, each requiring a screening question before proceeding to the next section to ensure that the respondent is qualified to answer it. The independent and dependent variables used in this investigation are listed in the following sections.

Table 1 shows the demographic analysis revealing a diverse sample of 290 respondents. The sample was slightly female-dominated (52.5%), with a strong representation of young to mid-career professionals aged 26-45 years (27.8%). The racial composition reflected Malaysia's multicultural landscape, with significant representation from Indian (46.2%), Malay (30.7%), and Chinese (22.5%) communities. Respondents predominantly belonged to middle-income households, with 38.3% earning between RM 3000-4999. The employment profile was balanced, with substantial representation from the private sector (26.6%), government (26.3%), and self-employed (21.5%) categories, ensuring a comprehensive perspective across various socio-economic segments.

Table 1: Respondents' Demographic

Variables	Categories	Frequency	Percentage (%)
Gender	Male	137	47.5
	Female	153	52.5
Age	< 25-years-old	60	20.6
	26-35 years old	84	27.8
	36-45 years old	73	24.7
	46-55 years old	51	18
	> 56 years old	22	8.9
Race	Malay	91	30.7
	Chinese	65	22.5
	Indian	132	46.2
	Other	2	0.68
Household income	RM 1000-RM 2999	77	26.5
	RM 1000-RM 4999	65	22.4
	RM 3000-RM 4999	111	38.3
	RM 5000 dan ke atas	37	12.8
Employment	Student	39	13.9
	Self-employed	62	21.5
	Government	77	26.3
	Private	79	26.6
	Not working	33	11.7

Descriptive Analysis: Table 2 shows the findings of the descriptive analysis conducted on the research instrument. The descriptive analysis of the (INT) dimension reveals a consistent and strong commitment to minimizing food waste across various contexts. The survey items demonstrate high mean scores, ranging from 3.67 to 4.13 on a 5-point scale. Specifically, participants showed the highest intention (M = 4.13, SD = 1.071) towards finishing all food ordered in a restaurant. The standard deviation of around 1.07-1.21 indicates some variability in responses, suggesting that while the majority strongly agree, there is still a spread of opinions. The item "I intend to produce as few leftovers as possible" also received high agreement (M = 4.11, SD = 1.113), further emphasizing participants' proactive approach to food waste reduction.

The (PN) construct demonstrates a robust internal moral motivation towards reducing food waste. Participants consistently reported high personal obligation and emotional engagement with the issue. The most striking response was to the statement "I will be a better individual if I don't waste food" which garnered a mean of 4.23 with a standard deviation of 1.204. This finding suggests a strong personal identity connection to food waste reduction. Participants also expressed significant emotional distress about food waste, with a mean of 3.89 (SD = 1.056) for feeling disturbed by the amount of resources required in food processing. The high mean scores across personal norm items indicate a deep-seated moral commitment to responsible food consumption.

The (AR) dimension reveals a collective approach to addressing food waste. Participants overwhelmingly agreed that responsibility is a shared endeavor. The statement "Everyone is responsible for reducing food waste" had a mean of 3.94 (SD = 1.034), indicating a strong sense of collective accountability. Interestingly, participants are “willing to reduce food waste even when others might not” with a mean of 3.73 (SD = 0.899). The item about “feeling responsible for the negative consequences of food waste” scored particularly high (M = 4.20, SD = 1.234), suggesting a profound sense of personal and collective responsibility.

The (AC) construct highlights participants' sophisticated understanding of the broader impacts of food waste. Respondents showed high agreement that reducing food waste has wide-reaching benefits. The statement "Reducing food waste will benefit everyone" had a mean of 4.16 (SD = 1.102), demonstrating a strong belief in the positive potential of waste reduction. Participants also recognized the global implications of food waste, with a mean of 4.09 (SD = 1.082) for the item about food waste in their country impacting people in other countries. The awareness of environmental and health consequences was also notable, with mean scores around 3.71-3.65, indicating a comprehensive understanding of food waste's multifaceted impacts.

Across all four constructs which are (INT), (PN), AR), and (AC), the data consistently shows mean scores between 3.67 and 4.23. The standard deviations range from 0.899 to 1.234, demonstrating moderate heterogeneity in responses. Based on the findings, it shows a robust and uniform disposition towards the reduction of food waste.

Table 2: Descriptive Analysis for (INT), (PN), (AR), and (AC)

Num	Survey Items	N	Mean	Std Dev
(INT)				
1	Finish all the food ordered while eating	290	4.13	1.071
2	Order as much food as you can eat	290	3.67	0.907
3	Finish all the food on the plate while eating	290	3.89	1.033
4	Produce few leftovers while eat	290	4.11	1.113
5	Not to throw away food ordered	290	4.05	1.210
(PN)				
1	Feeling guilty throwing food away	290	4.12	1.154
2	Will be a better person if you don’t waste food	290	4.23	1.204
3	Being disturbed by the amount of food waste	290	3.89	1.056
4	Feeling obligated to reduce food waste thus alert while buying groceries	290	4.14	1.102

(AR)				
1	All individuals responsible for reducing food waste	290	3.94	1.034
2	All communities are responsible for reducing the amount of food waste	290	4.04	1.215
3	Willing to reduce food waste while others are not do so	290	3.73	0.899
4	Responsible for negative consequences on food waste	290	4.20	1.234
5	Responsible for the consequences that happened to the environment and ecology caused by food waste	290	4.05	1.158
(AC)				
1	Reducing food waste gives an advantage to all stakeholders.		4.16	1.102
2	Reduce food waste to improve quality of life.		3.97	1.008
3	Reduce food waste to create a better environment		3.65	1.025
4	Food waste affects the environment and has a direct impact on health.		3.71	0.917
5	Food waste produced will impact those in other countries.		4.09	1.082

Note: Likert Scale (1: Strongly Disagree-5: Strongly Agree)

Pearson of Correlation Analysis: The Pearson Correlation method is employed to ascertain the direction and strength of a linear relationship between two variables (Sekaran & Bougie, 2016). Table 3 displays the correlation among (AC), (AR), PN), and (INT). Table 3 indicates a substantial positive connection (r = 0.793) between (AC) and (INT). Subsequently, a weak positive connection (r = 0.806) exists between (AR) and (INT). A substantial positive connection (r = 0.831) exists between (PN) and (INT). All possible associations established had a positive correlation.

Table 3: Pearson Correlation

		(INT)	(PN)	(AR)	(AC)
INT	Pearson Correlation	1	.831**	.806**	.793**
	Sig. (2-tailed)		<.001	<.001	<.001
	N	290	290	290	290
PN	Pearson Correlation	.831**	1	.833**	.793**
	Sig. (2-tailed)	<.001		<.001	<.001
	N	290	290	290	290
AR	Pearson Correlation	.806**	.833**	1	.844**
	Sig. (2-tailed)	<.001	<.001		<.001
	N	290	290	290	290
AC	Pearson Correlation	.793**	.793**	.844**	1
	Sig. (2-tailed)	<.001	<.001	<.001	
	N	290	290	290	290

***Correlation is significant at the 0.01 level (2-tailed)*
** Correlation is significant at the 0.05 level (2-tailed)*

ANOVA Test: Table 4 illustrates the result of the ANOVA test that produces F (3,286) = 285.126 and p < .000, signifying substantial differences across group averages in (AC), (AR), and (PN). If the p-value is less than .000, then it offers compelling evidence against the null hypothesis. Utilizing a commonly accepted significance level of 0.05, the results refute the null hypothesis, demonstrating significant disparities in (AC), (AR), and (PN) among the groups. These findings highlight the importance of (AC), (AR), and (PN) in understanding group

differences. Subsequent post-hoc analyses may be performed to discover particular group differences and investigate the ramifications of the findings.

Table 4: ANOVA Test Result

Model		Sum of Squares	df	F	Sig.
1	Regression	129.939	3	285.126	<.000b
	Residual	43.446	286		
	Total	173.385	298		

a. Dependent Variable: (INT).
Predictors: (Constant), (AC), (AR), (PN)

Dependent Variable's Coefficient: This study employed multiple linear regression analysis to identify the predictor factors that most effectively explain the dependent variable. As shown in Table 5, the beta value for (AC) is .252, which demonstrates the highest among the independent variables with the most significant unique contribution in this study. It was followed by the practices' beta value of .447. Conversely, attitude exhibited a diminished connection, with a beta value of .221. Moreover, all variables exhibited significant levels (sig.) below conventional thresholds, signifying their substantial contribution to predicting the dependent variable. (AC), (AR), and (PN) exert a favorable influence. The results indicate statistically significant associations between each independent variable (AC), (AR), (PN) and the dependent variable which is (INT). The corrected R^2 value of .749 signifies that knowledge, attitude, and behaviors collectively account for 7.49% of the variability in the dependent variable. This comprehensive model highlights the importance of these variables in comprehending the Intention to Reduce Food Waste (INT).

Table 5: Coefficient of Dependent Variable

Model		Unstandardized	Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	.527	.125		4.226	.000
	AC	.264	.061	.252	4.350	.000
	AR	.202	.058	.221	3.466	.001
	PN	.391	.049	.447	7.970	.000

a. Dependent Variable: (INT)

Discussion

The main objective of this study is to ascertain the impact of (AC) on the (PN) regarding the reduction of food waste in restaurants within Klang Valley. The assessment of (PN) reveals a mean score distribution ranging from 3.89 to 4.23, indicating that respondents' behaviors encompass the entire Likert scale, from strong disagreement to strong agreement. The highest mean score is 4.23 with a standard deviation of 1.204, was linked to statement number 2: "be better individual if don't waste food." In contrast, the lowest mean score was 3, corresponding to the statement, "disturbed by the amount of waste food," which yielded a mean score of 3.89 and a standard deviation of 1.056. (PN) are essential for mitigating food waste in restaurants as they serve as an internal moral compass, guiding consumer behavior. According to research, when people accept personal responsibility for their food waste, it activates their norms and motivates them to engage in environmentally responsible actions. Food preservation engenders a sense of duty that mitigates negative emotions such as remorse while enhancing positive feelings like pride and self-esteem. Consequently, more robust personal norms correlate with elevated objectives for minimizing food waste, becoming an essential element in promoting sustainable dining behaviors.

The multiple regression analysis aimed to identify the correlations between independent variables such as (AC), (AR), (PN), and (INT) at a restaurant in Klang Valley. The hypotheses were developed to determine the importance of these associations, and the study revealed interesting results. The results demonstrate a good

correlation (R=0.749) between the independent and dependent variables. The R^2 value of 0.747 suggests that (AC), (AR), and (PN) jointly explain 74.9% of the variation in (INT) at restaurants in Klang Valley. The ANOVA test found significant differences in group means for (AC), (AR), (PN) (p-value < 0.000).

The coefficients analysis provides additional insights into the unique contributions of each independent variable. Notably, (AC) and (PN) demonstrated positive and significant contributions, with beta values of 0.252 and 0.447, respectively. These results suggest an increase in (AC) and (PN) to reduce food waste at restaurants in Klang Valley. (AR), on the other hand, showed a weaker and lower correlation (beta = 0.221), "reducing food waste will create a better environment for me and my family."

The Pearson Correlation analysis found significant correlations between (AR),(AC) and (PN) and the dependent variable which is (INT) at restaurants in Klang Valley. The research identified a substantial positive association ($r = 0.806$, $p < 0.000$) between (AR) and (INT), hence validating H1, which emphasizes the importance of individual accountability in mitigating food waste. Every endeavor to decrease food waste must include (AR) to ensure that individuals and communities understand their responsibility in this vital issue, creating a desire to reduce waste even when others do not (Hassan et al., 2023). Secondly, although a statistically significant correlation ($r = 0.806$, $p = 0.000$) exists between (AC) and (INT), the mean score of 3.65 for the statement "Reducing food waste will create a better environment" reflects a diminished level of Awareness of Consequences (AC) compared to other items. Individuals are motivated by avoiding wasting food, and the need to reduce food waste. This finding identifies an important area for intervention, as raising knowledge about the personal and social benefits of reducing food waste is key to cultivating a more sustainable attitude (Reuter et al., 2022). Finally, a significant positive connection ($r = 0.831$, $p < 0.000$) was found between (PN) and (INT), supporting the acceptability of H3. Overall, the mean scores imply that emotions of guilt associated with throwing food away, the desire to be a better individual by not wasting food, and the need to limit food waste all play critical roles in motivating individuals. This finding aligns with recent studies that indicate that personal norms are important in driving pro-environmental conduct (Parga et al., 2023). Multiple regression analysis confirmed these correlations, with an R^2 value of 0.747, suggesting that the independent variables explain 74.9% of the variation in INT. Notably, while (AC) and (PN) displayed substantial positive effects, (AR) showed a lesser association (beta = 0.221), indicating that interventions should also focus on improving personal accountability in this situation.

Furthermore, using a series of statistical tests, the gathered empirical data demonstrated that all assumptions were supported. The findings of this study contributed to a greater understanding of how to reduce food waste in Klang Valley eateries. Awareness of Consequences (AC), Ascription of Responsibility (AR), Personal Norm (PN), and Intention to Reduce Food Waste (INT) all had a good impact on food waste reduction in restaurants in the Klang Valley.

5. Conclusion and Recommendations

To conclude, the Norm Activation Model (NAM) was used to identify how customer behavior may be influenced to reduce food waste in restaurants in the Klang Vall. The study underscores the significance of awareness of consequences (AC), ascription of responsibility (AR), personal norms (PN), and intentionality in fostering pro-environmental behaviors. Theoretically, the NAM provides a thorough framework for comprehending the accountability and internalized norms that might influence behaviors to reduce food waste in dining environments. Practically, this study demonstrates that increasing consumer awareness and responsibility about the impacts of food waste to the environment and society can lead to more sustainable practices within restaurants. Stakeholders can effectively encourage consumers to reduce waste by activating personal norms through targeted NAM-based interventions. To translate these findings into actionable steps, stakeholders, particularly restaurant owners and policymakers, should consider implementing targeted interventions. For instance, training restaurant staff to subtly guide customer choices through behavioral nudges or providing incentives for portion control strategies could effectively minimize waste. Additionally, menu adjustments, such as offering customizable portion sizes or promoting food-sharing options, may further encourage sustainable consumption. This strategy can foster a more accountable and sustainable food service sector in the Klang Valley. The findings underscore the importance of personal norms in driving behavior and provide pragmatic ways for executing NAM-driven initiatives in restaurant operations.

This study, notwithstanding its contributions, has certain limitations. The emphasis on consumer attitudes and intentions in the Klang Valley may limit its applicability to other regions or cultural contexts. The cross-sectional approach and dependence on self-reported data may induce biases, complicating the establishment of causal links between variables. Future research may gain from longitudinal studies or experimental designs to more effectively document behavioral changes over time. To improve the reliability and relevance of findings, future research could overcome these constraints by combining ongoing research and larger geographic samples. Additionally, as this study focuses on a specific regional context, its findings may not be entirely generalizable; expanding the research to diverse cultural settings would enhance its applicability.

Going forward, food industry stakeholders are encouraged to collaborate with researchers and policymakers to implement NAM-awareness strategies effectively. Policymakers may leverage the findings of this study to formulate legislation that fosters sustainable consumption in restaurants, while industry stakeholders can utilize NAM to enhance corporate social responsibility and appeal to environmentally aware consumers. Policymakers and restaurant operators can drive meaningful behavioral change by fostering awareness of personal responsibility and reinforcing social norms around waste reduction. Integrating educational campaigns with structural interventions such as clear communication on food waste impact and strategic menu design can further strengthen consumer commitment to minimizing plate waste. Furthermore, the objective of minimizing food waste in Klang Valley restaurants can be achieved by integrating initiatives aimed at enhancing awareness, fostering accountability, and encouraging sustainable practices. This study successfully achieved its goal by illuminating the applicability and benefits of the norm activation model in addressing food waste. It has contributed to both theoretical developments in behavioral psychology and practical implications for sustainable consumption practices.

Acknowledgement: The authors convey appreciation to Universiti Teknologi MARA Cawangan Terengganu for its encouragement regarding publication. We would like to thank the undergraduate students who gathered the data and the co-authors who contributed their expertise in related fields to make this study possible.

References

Ariffin, Z. Z., Anuar, S. N., Mangadi, N. F., Yaakop, A. Y., Sakawi, Z., Jusoh, S., & Ibrahim, M. A. (2023). Household food waste behavior in Klang Valley, Malaysia, and its potential in the circular economy. *Sustainability, 15*(12), 9431.

Ariestiningsih, E. S., Muchta, A. A., & Sulaeman, M. (2020). The Role of Ascription of Responsibility on Pro-Environmental Behavior in Jakarta Communities. *Proceedings of the 1st International Conference on Recent Innovations (ICRI 2018)*. 2251-2258. https://doi.org/10.5220/0009941422512258

Aydın, A. E., & Yıldırım, P. (2021). Understanding food waste behavior: The role of morals, habits and knowledge. *Journal of Cleaner Production*, 280, 124250. https://doi.org/10.1016/j.jclepro.2020.124250

Chun T'ing, L., Moorthy, K., Gunasaygaran, N., Sek Li, C., Omapathi, D., Jia Yi, H., Anandan, K., & Sivakumar, K. (2021). Intention to reduce food waste: A study among Malaysians. *Journal of the Air and Waste Management Association*, *71*(7), 890–905. https://doi.org/10.1080/10962247.2021.1900001

De Groot, J. I. M., Bondy, K., & Schuitema, G. (2021). Listen to others or yourself? The role of personal norms on the effectiveness of social norm interventions to change pro-environmental behavior. *Journal of Environmental Psychology*, 78, 101688. https://doi.org/10.1016/j.jenvp.2021.101688

Iriyadi, Setiawan, B., & Puspitasari, R. (2023). Consumer intentions to reduce food waste in all-you-can-eat restaurants based on personal norm activation. *Heliyon,* 9(2), e13399. https://doi.org/10.1016/j.heliyon.2023.e13399

Jang, Y.-J., & Kim, E. (2023). Social and Personal Norms in Shaping Customers' Environmentally Sustainable Behavior in Restaurants' Social Media Communities. *Sustainability,* 15(8), 6410. https://doi.org/10.3390/su15086410

Jang, S. Y., & Ahn, J. (2024). Exploring consumer attitudes and behavior toward food waste reduction in upscale restaurants: A sustainable development perspective. *Journal of Sustainability Science*, *35*(4), 23-45.

Kim, S. H., & Seock, Y. (2019). The roles of values and social norms on personal norms and pro-environmentally friendly apparel product purchasing behavior: The mediating role of personal norms. *Journal of Retailing and Consumer Services,* 51, 83–90. https://doi.org/10.1016/j.jretconser.2019.05.023

Kim, W., Che, C., & Jeong, C. (2022). Food Waste Reduction from Customers' Plates: Applying the Norm Activation Model in South Korean Context. *Land,* 11(1), 109. https://doi.org/10.3390/land11010109

Kumar, V., & Rathore, P. (2024). Nudging consumer behavior for waste management in restaurants: Insights from experimental research. *Journal of Consumer Behavior*, *48*(2), 112-125.

Lin, H., & Lee, C. (2024). Social norms and consumer responsibility in food waste reduction: Evidence from Asian restaurant settings. *International Journal of Hospitality Management*, *98*, 102014.

Ma, Y., Mamun, A. A., Ali, M. H., Hoque, M. E., & Li-Li, Z. (2023). Modeling the intention and adoption of food waste prevention practices among Chinese households. *Humanities and Social Sciences Communications,* 10(1). https://doi.org/10.1057/s41599-023-02348-9

Munerah, S., Koay, K. Y., & Thambiah, S. (2021). Factors influencing non-green consumers' purchase intention: A partial least squares structural equation modelling (PLS-SEM) approach. *Journal of Cleaner Production,* 280, 124192. https://doi.org/10.1016/j.jclepro.2020.124192

Nelson, P., Scheiber, F., Laughlin, H., & Demir-Lira, Ö. (2021). Comparing face-to-face and online data collection methods in preterm and full-term children: an exploratory study. Frontiers in Psychology, 12. https://doi.org/10.3389/fpsyg.2021.733192.

Obuobi, B., Zhang, Y., Adu-Gyamfi, G., & Nketiah, E. (2023). Households' food waste behavior prediction from a moral perspective: a case of China. Environment, *Development and Sustainability*. https://doi.org/10.1007/s10668-023-03136-w

Oh, J., & Ki, E. (2022). Extending norm activation theory to understand publics' support for environmentally responsible organizations. *Corporate Communications: An International Journal*, 28(3), 381–399. https://doi.org/10.1108/ccij-03-2022-0024

Phooi, C. L., Azman, E. A., Ismail, R., Arif Shah, J., & Koay, E. S. R. (2022). Food Waste Behavior and Awareness of Malaysian. *Scientifica*, *2022*. https://doi.org/10.1155/2022/6729248

Ritchie, B. W., Prideaux, B., Thompson, M., & Demeter, C. (2022). Understanding tourists' attitudes toward interventions for the Great Barrier Reef: an extension of the norm activation model. *Journal of Sustainable Tourism*, *30*(6), 1364–1383. https://doi.org/10.1080/09669582.2021.1948048

Savari, M., Damaneh, H. E., Damaneh, H. E., & Cotton, M. (2023). Integrating the norm activation model and theory of planned behavior to investigate farmer pro-environmental behavioral intention. *Scientific Reports*, 13(1). https://doi.org/10.1038/s41598-023-32831-x

Schwartz, S. H. (1977). Normative Influences on Altruism. *Advances in Experimental Social Psychology*, 10, 221-279. https://doi.org/10.1016/s0065-2601(08)60358-5

Sekaran, U. & Bougie, R. (2016) Research Methods for Business: A Skill-Building Approach. 7th Edition, Wiley & Sons, West Sussex.

Setiawan, B., Afiff, A. Z., & Heruwasto, 1. (2020). Integrating the Theory of Planned Behavior With Norm Activation in an Environmental Context. *Social Marketing Quarterly*, 26(3), 152450042094922. https://doi.org/10.1177/1524500420949220

Setiawan, B., Afiff, A. Z., & Heruwasto, 1. (2021). Personal Norm And Environmental Consumer Behavior: An Application Of Norm Activation Theory. *ASEAN Marketing Journal*, 13(1). https://doi.org/10.21002/amj.v1311.13213

Sha'ari, N. S. M., Sazali, U. S., Zolkipli, A. T., Vargas, R. Q., & Shafie, F. A. (2023). Environmental assessment of casual dining restaurants in urban and suburban areas of peninsular Malaysia during the COVID-19 pandemic. *Environmental Monitoring and Assessment*, *195*(2), 346. This article explores the environmental impact of food waste in casual dining, with insights into Malaysian consumer behavior

Shen, G., Li, Z., & Hong, T. (2023). The status of the global food waste mitigation policies: experience and inspiration for China. *National Library of Medicine*, 37362998. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10073629/

Song, J., Cai, L., Yuen, K. F., & Wang, X. (2023). Exploring consumers' usage intention of reusable express packaging: An extended norm activation model. Journal of Retailing and Consumer Services, 72(November 2022), 103265. https://doi.org/10.1016/j.jretconser.2023.103265

Talwar, S., Kaur, P., Okumus, B., Ahmed, U., & Dhir, A. (2021). Food waste reduction and taking away leftovers: Interplay of food-ordering routine, planning routine, and motives. International Journal of Hospitality Management, 98, 1-12. https://doi.org/10.1016/j.ijhm.2021.103033

Wang, J., Li, M., Li, S., & Chen, K. (2022). Understanding Consumers' Food Waste Reduction Behavior—A Study Based on Extended Norm Activation Theory. *International Journal of Environmental Research and Public Health*, 19(7), 4187. https://doi.org/10.3390/ijerph19074187