

A Study on Consumer Attitudes and Behavioural Intentions Towards Food Waste in the Indian Restaurant Industry

Ms. Anjali Ved¹, Dr. Parag Ajgaonkar²

¹Research Scholar at University of Mumbai, Assistant Professor and Research Centre, SVKM's Narsee Monjee College of Commerce and Economics (Empowered Autonomous)

²Research Guide and Principal, SVKM's Narsee Monjee College of Commerce and Economics (Empowered Autonomous)

Abstract:

As food waste in the restaurant industry becomes a sustainability issue, consumer eating habits have been cited as a key but under-researched contributor, especially in the developing world. In this study, the authors used the Theory of Planned Behaviour (TPB) to examine the attitudes of the consumers and their intentions to act on food waste in the restaurant industry of India. The study is conducted with 100 urban consumers using a structured 37 item Likert scale questionnaire and explores the effects of consumer awareness, behavioural factors, psychological factors and social factors on consumer attitudes and investigates if attitudes further predict willingness to engage in waste reduction practices. The 5 hypotheses were accepted at $p < 0.001$. The social factors were the most significant ($r = 0.410$), followed by the psychological factors ($r = 0.367$) and behavioural factors ($r = 0.360$) for food waste attitude. Consumer awareness had a significant positive correlation with the attitude ($r = 0.504$), and the attitude had significant positive correlation with the willingness to act ($R^2 = 0.137$). It was found that there is a notable attitude-behaviour gap with attitude being at the highest mean score (4.020) and behavioural factors being the lowest mean score (3.383). The results highlight the importance of multi-level, culturally responsive interventions to tackle social norms around eating and drinking, to engage in personal responsibility, and to overcome behaviours inhibiting responsible dining. The study adds original empirical data to the scarce research in the field of consumer food waste in the Indian hospitality context.

Keywords: Food waste, consumer attitude, restaurant industry, Theory of Planned Behaviour, India, behavioural intention, social norms.

Introduction

The challenge of food waste is becoming a big problem around the world, with food waste occurring at different points in a food supply chain, from production and processing through distribution and even to the last point of consumption (Tajdar & Ansari, 2025). This issue not only involves a huge amount of precious resource like water, energy, labour and land but also results in higher greenhouse gas emissions as well as landfill pressure (Sahoo et al., 2022). However, food waste poses significant ethical and social issues, especially given the global hunger and food insecurity despite the availability of enough food in

the world (Tajdar & Ansari, 2025). The reduction of food waste is therefore a subject of global importance that is part of a wider issue on sustainable development and responsible consumption.

The restaurant sector has a notable role in food waste as it discards a massive amount of food during the preparation, service and consumption process. The main reasons for food waste in restaurants are over-prep, food spoilage, inventory inefficiencies, buffet food and leftovers on the restaurant's plates. (Grewal et al., 2024)

The problem is even more severe in the Indian context, as culture dictates that when food is available, it is readily accepted as a sign of hospitality; fixed price buffet-style eating encourages over-consumption; and social taboos around packaging up leftovers lead to avoidable wastage in restaurants (Bharucha, 2018; Sahoo et al., 2022; Venugopal et al., 2024).

Operational inefficiencies account for much of the food waste in restaurants, but the amount of "plate waste" created is also influenced by consumer attitudes and behaviours. Consumer eating habits like over ordering, not keeping leftover food at home, wanting variety, changing food preferences, and social food etiquette can all lead to unnecessary food waste. Previous research in India has indicated that consumers' attitudes towards food waste are significantly shaped by environmental awareness, personal values, subjective norms and cultural factors (Davison et al., 2022; Venugopal et al., 2024; Wani et al., 2024). Further research has shown positive consumer attitudes towards sustainability have a strong impact on the intention to reduce food waste and responsible consumption.

Food waste also has significant economic consequences. Bharucha (2018) estimates that Indian food waste is worth more than US\$14 billion annually, meaning that strategies to cut down on food waste throughout the food service industry are crucial. Given the magnitude of the problem, the United Nations declared the reduction of food waste as one of the key pillars in achieving sustainable food systems, food security and social equity (Filimonau et al., 2020).

Knowing what consumers think and feel about food waste is crucial in designing strategies to address it and promote sustainable restaurant operations. Consumers are the last link in the food consumption chain and play a direct role in the amount of food wasted at the end of the food chain. The analysis of these attitudes can offer insights as to the behavioural, psychological and social determinants of food waste in restaurants. This knowledge can also help both restaurant owners and policymakers in designing awareness campaigns, behavioural interventions, and waste reduction strategies for responsible dining. This understanding can also be used to create awareness programs, behavioural interventions and waste reduction initiatives for the promotion of responsible dining practices both for restaurant owners and local policymakers.

Review of Literature

Food waste refers to edible food discarded at the retail and consumer level of the food supply chain, while food loss occurs during food production, post-harvest processing and food storage in the upstream supply chain (Dora et al., 2020; O'Connor et al., 2023). With regard to global implications, food waste has far-reaching environmental, economic, and social impacts, such as emission of greenhouse gases, water scarcity, land degradation, significant economic losses, and ethical implications of food insecurity and hunger (Papargyropoulou et al., 2014; Urugo et al., 2024; Kohli et al., 2023). In this context, the restaurant sector is one of the most important, food service operations represent about 17-20% of food waste in the national level in countries like Germany and Switzerland, showing the size and importance of food waste within the sector of hospitality (Malefors et al., 2019; Okumuş et al., 2020).

Restaurants are a source of food waste at several stages of the restaurant process: over-production during preparation, improperly stored foods, food wastage at large-scale buffet and food left on the plate by the customer resulting from too large portions and too many food options (Filimonau et al., 2019; Öztürk et al., 2023; Papargyropoulou et al., 2016). The problem is more pronounced in Indian context where culture relates food abundance with good hospitality, buffet style pricing where people eat more than is offered, and the social stigma attached to packaging surplus food collectively fuels avoidable food wastage in restaurants (Bharucha, 2018; Sahoo et al., 2022; Venugopal et al., 2024).

A key driver of plate-level food waste is consumer behaviour. Pro-Environmental attitudes have been found consistently as a key driver of responsible dining behavior, with consumers who exhibit a higher level of sustainability awareness more likely to make mindful choices when ordering food, and to reduce waste (Agarwal et al., 2024; Dekšne et al., 2025). The Theory of Planned Behaviour (TPB) provides a sound theoretical basis to explain this relationship, which suggests that behavioural intentions such as the intention to reduce food waste are determined by three factors: individual attitudes, subjective norms, and perceived behavioural control (Ajzen, 1991; Visschers et al., 2016). Norms around social dining are often in conflict with personal intentions and add to ordering too much and dishes left over (Papargyropoulou et al., 2016; Filimonau et al., 2020). Further psychological factors like habits around food consumption, perceived behavioural control and mismatch between individual actions and the environmental impacts contribute to food wastage at the consumer level (Agarwal et al., 2024; Radde et al., 2024).

In turn, hotels and restaurants have become more interested in food waste reduction methods such as menu engineering, portion control, leftover packaging efforts, and consumer awareness campaigns (Filimonau et al., 2019; Okumuş et al., 2020; Urugo et al., 2024). These operational strategies have potential, but require consumer engagement and a change of attitudes and norms around eating. Although various factors influencing food waste management have been studied, empirical studies on consumer attitudes and the behavioural, psychological and social factors affecting food waste specifically in the Indian restaurant setting are still limited (Sahoo et al., 2022; Wani et al., 2024). This study aims to bridge this gap by examining the awareness, attitude and willingness to adapt the responsible dining practice among the consumers in the restaurant industry of India.

Research Objectives

1. To examine consumer awareness and attitude regarding food waste in restaurants.
2. To identify factors (behavioural, psychological and social) contributing to food wastage by consumers.
3. To analyse consumers' willingness to adopt food waste reduction practices (ordering appropriate portions, requesting leftover packaging, and supporting sustainable restaurant initiatives) in restaurants.
4. To propose strategies for minimizing consumer-generated food waste in the restaurant industry based on empirical findings.

Terms Used

Consumer Attitude is the level of response an individual has to a food waste problem as an ethical issue and takes responsibility for reducing food waste both personally and collectively. Measured on five dimensions related to moral values, responsibility and belief in the importance of the individual's dining choices (Ajzen, 1991).

Consumer Awareness is the level of awareness that a consumer possesses about the environmental, economic and sector related impacts of food waste, especially in the restaurant industry (Wani et al., 2024). Behavioural Factors involve directly causing plate waste through observable eating behaviour practices, such as over-ordering, ordering too many different food items to eat, not knowing which portion is large for them and not taking food away from the meal, back to the kitchen (Filimonau et al., 2019).

Psychological Factors are internal cognitive and affective states that influence eating habits, such as environmental consciousness, guilt over food waste, perception of personal responsibility and the ability to make conscious food choices (Radde et al., 2024; Ajzen, 1991).

Social Factors are the interpersonal and cultural influences on ordering behaviour in restaurants such as peer influence, social discomfort in ordering smaller portions, culture cues of abundance, embarrassment associated with ordering leftovers, and occasion-driven over ordering (Papargyropoulou et al., 2016; Bharucha, 2018).

Willingness to Adopt Waste Reduction Practices is the intent to take specific waste minimizing actions when eating out, such as ordering the right size portions, asking for packaging to be returned and for restaurants to be involved in sustainable programs. In the TPB model, this is the behavioural intention that is the immediate precursor of behaviour (Ajzen, 1991).

Research Methodology

The study is descriptive quantitative in nature with theoretical underpinnings based on the Theory of Planned Behaviour (TPB) of Ajzen (1991). Primary data was gathered from 100 urban Indian consumers and a structured questionnaire containing 37 items, each rated on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) was used. Convenience sampling was used because of the exploratory nature of this study. Cronbach's alpha was used to test the reliability of data, descriptive statistics to do mean score profiling, Pearson correlation coefficient to do test of H1 to H4, and simple linear regression and multiple regression to do test of H5. All scales were given an $\alpha = 0.05$ and showed acceptable to good internal consistency ($\alpha = 0.677 - 0.848$).

Hypothesis

H0₁: There is no significant relationship between consumer awareness of food waste and their attitude towards reducing it in restaurants.

H1₁: There is a significant relationship between consumer awareness of food waste and their attitude towards reducing it in restaurants.

H0₂: Behavioural factors such as frequency of over-ordering, portion size selection, and willingness to carry leftovers do not significantly influence consumer food wastage in restaurants.

H1₂: Behavioural factors such as frequency of over-ordering, portion size selection, and willingness to carry leftovers significantly influence consumer food wastage in restaurants.

H0₃: Psychological factors such as level of environmental consciousness, feeling of guilt when wasting food, and perceived ability to control food waste do not significantly influence consumer food wastage in restaurants.

H1₃: Psychological factors such as level of environmental consciousness, feeling of guilt when wasting food, and perceived ability to control food waste significantly influence consumer food wastage in restaurants.

H04: Social factors such as peer influence on ordering decisions, social discomfort in requesting smaller portions, and cultural expectations of food variety do not significantly influence consumer food wastage in restaurants.

H14: Social factors such as peer influence on ordering decisions, social discomfort in requesting smaller portions, and cultural expectations of food variety significantly influence consumer food wastage in restaurants.

H05: Consumer attitude towards food waste does not significantly influence their willingness to adopt waste reduction practices.

H15: Consumer attitude towards food waste significantly influences their willingness to adopt waste reduction practices

Limitations

There are some limitations of the study. Restrictions of generalisability to a variety of Indian consumer segments and regions are due to the convenience sampling and sample size of 100. Responses are based on self-declaration may be subject to social desirability bias. The cross-sectional design did not allow for causal inference and demographic variables (age, income) were not tested as analytical moderators.

Data Analysis and Interpretation

1. Reliability Analysis — Cronbach's Alpha

Before testing the hypotheses, internal consistency of each scale was assessed using Cronbach's Alpha (α). A value of $\alpha \geq 0.7$ is considered acceptable for social science research (Nunnally, 1978).

Section	Variable	Items	α Value	Interpretation
B	Consumer Awareness	5	0.752	Acceptable
C	Consumer Attitude	5	0.768	Acceptable
D	Behavioural Factors	6	0.848	Good
E	Psychological Factors	6	0.677	Acceptable
F	Social Factors	6	0.841	Good
G	Willingness to Act	6	0.819	Good

All six sections returned Cronbach's Alpha values between 0.677 and 0.848, confirming acceptable to good internal consistency across scales. This validates that items within each section reliably measure the same underlying construct. The scales are therefore suitable for hypothesis testing.

2. Descriptive Statistics

Table 2 presents the mean scores and standard deviations for all six composite variables computed from the Likert-scale responses of 100 respondents.

Variable	Mean	Std. Dev	Min	Max	Level
Awareness	3.896	0.531	2.60	5.00	High
Attitude	4.020	0.568	2.40	5.00	High
Behavioural	3.383	0.631	2.00	4.83	Moderate
Psychological	3.795	0.462	2.67	4.83	Moderate-High
Social	3.585	0.633	1.50	5.00	Moderate-High
Willingness	3.762	0.568	2.50	5.00	Moderate-High

The mean score of consumer attitude (4.020) was the highest showing a positive attitude towards food waste reduction among the sample. Consumer Awareness was the second highest (3.896), indicating high environmental awareness. The results of the behavioural factors showed the lowest mean (3.383), which indicated that although having positive attitudes, some behavioural problems are also present, such as over ordering and reluctance to take leftovers, as reported in the existing literature. The scores for Willingness to Act (3.762), Psychological Factors (3.795) and Social Factors (3.585) were all within the moderate to high range.

3. Hypothesis Testing

H1 — Consumer Awareness and Attitude

H0₁: There is no significant relationship between consumer awareness of food waste and their attitude towards reducing it in restaurants.

H1₁: There is a significant relationship between consumer awareness of food waste and their attitude towards reducing it in restaurants.

Test Applied: Pearson Correlation Coefficient

	Awareness	Attitude	t-value	p-value
Mean	3.896	4.020		
Std. Deviation	0.531	0.568		
Pearson r	0.504	—	5.779	< 0.001

The Pearson correlation between Consumer Awareness and Consumer Attitude yielded $r = 0.504$, $t(98) = 5.779$, $p < 0.001$. This indicates a moderate to strong, statistically significant positive relationship between the two variables.

Decision: H0₁ is REJECTED. H1₁ is ACCEPTED.

Interpretation: The more aware consumers are about food waste, the more positive attitudes they have towards food waste reduction. This result is consistent with the TPB theory that suggests the initial stage of attitude formation is knowledge and beliefs. It is also consistent with the research of Agarwal et al. (2024) and Dekšne et al. (2025), which demonstrated that a greater awareness of the environment positively predicts the pro-environmental attitude of dining in restaurants.

H2 — Behavioural Factors and Food Wastage

H0₂: Behavioural factors such as frequency of over-ordering, portion size selection, and willingness to carry leftovers do not significantly influence consumer food wastage in restaurants.

H1₂: Behavioural factors significantly influence consumer food wastage in restaurants.

Test Applied: Pearson Correlation Coefficient

	Behavioural	Attitude	t-value	p-value
Mean	3.383	4.020		
Std. Deviation	0.631	0.568		
Pearson r	0.360	—	3.819	< 0.001

Item-Level Analysis:

Item	Statement	r	p-value	Result
D1	Often order more food than can consume	0.321	0.001	Significant
D2	Order variety even if may not finish	0.349	0.000	Significant
D3	Select portion without considering appetite	0.249	0.012	Significant
D4	Rarely carry leftover food home	0.252	0.011	Significant
D5	Inconvenient to ask food to be packed	0.264	0.008	Significant
D6	Ordering habits result in uneaten food	0.187	0.063	Marginal

The composite Behavioural Score correlated significantly with Attitude ($r = 0.360$, $t(98) = 3.819$, $p < 0.001$). At the item level, D1 (over-ordering, $r = 0.321$), D2 (ordering variety, $r = 0.349$), D3 (portion selection, $r = 0.249$), D4 (leftover reluctance, $r = 0.252$), and D5 (inconvenience of packing, $r = 0.264$) all showed significant relationships. D6 was marginally significant ($p = 0.063$).

Decision: H0₂ is REJECTED. H1₂ is ACCEPTED.

Interpretation: Finding that these behavioral attitudes (over-ordering, ordering too many different food items, and not taking leftovers) have a significant impact on attitudes towards food wastage. However, despite positive attitudes, problematic eating behaviours are still evident with a mean Behavioural Score of 3.383 (lowest score among all the sections). This aligns with the findings of Filimonau et al. (2019), and Agarwal et al. (2021) who found that plate waste in Indian restaurants was mainly due to over ordering and buffet food.

H3 — Psychological Factors and Food Wastage

H0₃: Psychological factors such as level of environmental consciousness, feeling of guilt when wasting food, and perceived ability to control food waste do not significantly influence consumer food wastage in restaurants.

H1₃: Psychological factors significantly influence consumer food wastage in restaurants.

Test Applied: Pearson Correlation Coefficient

	Psychological	Attitude	t-value	p-value
Mean	3.795	4.020		
Std. Deviation	0.462	0.568		
Pearson r	0.367	—	3.906	< 0.001

Item-Level Analysis:

Item	Statement	r	p-value	Result
E1	Feel guilty leaving food uneaten	0.276	0.005	Significant
E2	Conscious about environmental impact of waste	0.196	0.050	Significant
E3	Concern influences how mindfully I order	0.252	0.011	Significant
E4	Reducing waste is personal responsibility	0.315	0.001	Significant
E5	Confident in making mindful food choices	0.192	0.056	Marginal
E6	Thought of wasting food makes uncomfortable	0.127	0.209	Not Significant

The Psychological Score correlated significantly with Consumer Attitude ($r = 0.367$, $t(98) = 3.906$, $p < 0.001$). Item-level analysis shows E4 (personal responsibility, $r = 0.315$) and E1 (guilt, $r = 0.276$) as the strongest predictors. E2 (environmental consciousness, $r = 0.196$, $p = 0.050$) and E3 (mindful ordering, $r = 0.252$) were significant. E5 was marginally significant, while E6 did not reach significance individually.

Decision: H0₃ is REJECTED. H1₃ is ACCEPTED.

Interpretation: Psychological factors, particularly the sense of personal responsibility and guilt associated with food waste, significantly influence consumer attitudes. The mean Psychological Score of 3.795 reflects that urban Indian consumers increasingly internalise environmental responsibility. This aligns with Radde et al. (2024) and Agarwal et al. (2024), who emphasise that psychological guilt and perceived behavioural control are critical levers for pro-environmental dining behaviour.

H4 — Social Factors and Food Wastage

H04: Social factors such as peer influence on ordering decisions, social discomfort in requesting smaller portions, and cultural expectations of food variety do not significantly influence consumer food wastage in restaurants.

H14: Social factors significantly influence consumer food wastage in restaurants.

Test Applied: Pearson Correlation Coefficient

	Social	Attitude	t-value	p-value
Mean	3.585	4.020		
Std. Deviation	0.633	0.568		
Pearson r	0.410	—	4.448	< 0.001

Item-Level Analysis:

Item	Statement	r	p-value	Result
F1	Dining companions influence ordering	0.354	0.000	Significant
F2	Social pressure to order generously	0.226	0.024	Significant
F3	Uncomfortable asking smaller portions	0.318	0.001	Significant
F4	Cultural expectations influence ordering	0.281	0.005	Significant
F5	Embarrassed asking for parcel of leftovers	0.258	0.010	Significant
F6	Celebrations lead to over-ordering	0.409	0.000	Significant

The Social Score yielded the second highest correlation with Consumer Attitude among the three factor sections ($r = 0.410$, $t(98) = 4.448$, $p < 0.001$). Notably, all six items reached statistical significance, with F6 (celebrations, $r = 0.409$), F1 (companion influence, $r = 0.354$), and F3 (discomfort with smaller portions, $r = 0.318$) being the strongest predictors.

Decision: H04 is REJECTED. H14 is ACCEPTED.

Interpretation: Social factors exert the strongest influence among the three factor categories, with all items significant at $p < 0.05$. The high mean of F6 (celebrations lead to over-ordering) and F1 (companion influence) reflects deeply embedded cultural norms around food abundance in the Indian dining context. This is consistent with Papargyropoulou et al. (2016) and Bharucha (2018), who identify social dining norms and cultural hospitality values as primary contributors to plate waste in Indian restaurants.

H5 — Consumer Attitude and Willingness to Act

H0_s: Consumer attitude towards food waste does not significantly influence their willingness to adopt waste reduction practices.

H1_s: Consumer attitude towards food waste significantly influences their willingness to adopt waste reduction practices.

Test Applied: Simple Linear Regression

	R	R ²	β (Slope)	t-value	p-value
Attitude → Willingness	0.370	0.137	0.370	3.937	< 0.001

The regression model was statistically significant ($R = 0.370$, $R^2 = 0.137$, $p < 0.001$), with a standardised coefficient (β) of 0.370. This indicates that Consumer Attitude explains approximately 13.7% of the variance in Willingness to Act.

Decision: H0_s is REJECTED. H1_s is ACCEPTED.

Interpretation: Consumer attitude is a significant positive predictor of willingness to adopt food waste reduction practices. For every unit increase in attitude score, willingness increases by 0.370 units. The regression equation is: $\text{Willingness} = 2.276 + 0.370 \times \text{Attitude}$. This confirms the TPB proposition that attitude directly shapes behavioural intention — in this case, the intention to order mindfully, request parcels of leftover food, and support sustainable restaurants.

Multiple Regression — All Factors Predicting Willingness:

Predictor	β Coefficient	Contribution
Intercept	1.683	—
Behavioural	0.007	Minimal
Psychological	0.225	Moderate
Social	-0.001	Negligible
Attitude	0.300	Strongest
R² (overall)	0.166	16.6% variance explained

When all four predictors were entered simultaneously, the model explained 16.6% of variance in Willingness ($R^2 = 0.166$). Attitude ($\beta = 0.300$) and Psychological factors ($\beta = 0.225$) emerged as the two most meaningful predictors, while Behavioural and Social factors contributed minimally in this combined model. This suggests that internal factors — attitude and psychological motivation — are more powerful drivers of willingness than external social pressures.

Findings

Consumer awareness was moderately and significantly correlated with the consumer attitude ($r = 0.504$, $p < 0.001$). Higher levels of knowledge regarding the environmental, economic and social aspects of food waste were associated with significantly more positive attitudes toward food waste reduction. This sets awareness as an antecedent that is essential for attitude formation in the Indian restaurant context as per Agarwal et al. (2024) and Wani et al. (2024).

Over-ordering, ordering too much variety, portion size judgement and reluctance to take left overs were identified as having a significant impact on consumer food wastage ($r = 0.360$, $p < 0.001$). All but one of the 6 behavioural items were individually significant. Of particular note, ordering variety (D2, $r = 0.349$) and over-ordering (D1, $r = 0.321$) were the two strongest individual behavioural predictors. The mean Behavioural Score of 3.383 was the lowest of all sections, showing that there is a classic attitude-behaviour gap; consumers still have positive attitudes but still engage in wasteful eating behaviours.

Consumer attitude was correlated significantly with psychological factors with a value of 0.367 and a significance level of $p < 0.001$. However, personal responsibility ($r = 0.315$) and guilt ($r = 0.276$) were the strongest psychological drivers, indicating that internalising moral obligation is more important than abstract environmental concern for behaviour. E6 (general discomfort at wasting food) was not individually significant, showing that it is not enough to have passive emotional awareness without active personal norm activation.

The most significant correlation with consumer attitude was found in social factors ($r = 0.410$, $p < 0.001$) and the only factor section to achieve statistical significance, all six items in it also reached this level. Occasion-driven over-ordering (F6, $r = 0.409$) and companion influence (F1, $r = 0.354$) were the most significant social predictors. This finding is in line with Bharucha (2018) and Papargyropoulou et al. (2016) and highlights the effect of cultural dining routines, peers, and social norms of food abundance on perpetuating wastage behaviour at the Indian restaurant.

Simple linear regression analysis showed that there was a significant positive relationship between consumer attitude and willingness to reduce food waste actions ($R^2 = 0.137$, $\beta = 0.370$, $p < 0.001$). Attitude accounts for 13.7% of the variance in willingness. The addition of all four predictors into a multiple regression model resulted in an increase in the explained variance to 16.6% ($R^2 = 0.166$) with Attitude ($\beta = 0.300$) and Psychological factors ($\beta = 0.225$) being the two strongest predictors. This is in support of TPB's proposition that attitude is the main determinant of behavioural intention and that internal motivational factors are more influential in explaining the willingness to act than are external social factors.

The descriptive analysis showed that the mean for Consumer Attitude was 4.020 and for Behavioural Factors was 3.383 on the five-point scale with a difference of 0.637. The attitude-behaviour gap, in which consumers have high positive attitudes but still engage in wasteful behaviours, is recognized in sustainability literature (Davison et al., 2022) and is the core challenge for the design of the intervention in the Indian restaurant context.

Recommendations

1. **Normalise Leftover Packaging:** Make it easy for restaurants to express their willingness to package food left at the end of a meal, otherwise the offer becomes socially awkward. If it is presented as a normal service, rather than an exception, very much can be done to minimise plate waste.

2. **Emphasize Flexible Portion Sizes:** Restaurants should consider including smaller and customisable portions on menus, especially as a buffet or set menu. The half-portions with proportional prices helps consumers to shop according to their purchasing power.
3. **In-Restaurant Awareness Campaigns:** Nudges that are more visible, like food waste counters, table cards with waste reduction facts, and QR codes linking to sustainability initiatives can engage environmental consciousness at the moment of eating, helping to reduce the attitude-behaviour gap.
4. **Reframe Social Norms Around Food Abundance:** Industry associations, restaurant groups and hospitality trainers need to normalize responsible hosting as a cultural norm and encourage customers to eat responsibly by emphasizing mindful ordering and zero plate waste as signs of good eating habits.
5. **Include Food Waste Education in Hospitality Training:** Restaurant employees should be trained to help customers make the right choices in portions, to inform them about the sustainability of the restaurant and without putting the guest off. Behavioural nudges, by staff, have been found to be effective in minimising waste on plates (Filimonau et al., 2019).

Justification of Objectives

Objective 1: To examine consumer awareness and attitude regarding food waste in restaurants.

The questionnaire was divided into two sections: B and C, which helped in achieving Objective 1. Both constructs had high mean scores and the results of Hypothesis H1 were found to be significant and supporting the hypothesis that there is a positive relationship between awareness and attitude, in the Indian restaurant context, awareness can be regarded as a significant antecedent to attitude formation.

Objective 2: To identify factors (behavioural, psychological and social) contributing to food wastage by consumers.

Objective 2 was satisfied with parts D, E and F of the questionnaire. All three factor categories were found to significantly affect consumer food waste attitude in the hypothesis testing, with the social factors being the most dominant in affecting attitude, due to the nature of the occasion, over-ordering and influence of companions. The psychological factors were predominantly personal responsibility/guilt, and the behavioural factors were mainly ordering and variety-seeking.

Objective 3: To analyse consumers' willingness to adopt food waste reduction practices in restaurants.

The objective of this questionnaire was achieved by completing Section G. The mean Willingness Score showed a moderate to high score indicating some level of readiness among respondents. H5 was also supported as the consumer's attitude towards the product significantly explained the willingness to act with attitude and psychological factors being the two strongest combined predictors, supporting the proposition of the TPB that attitude explains behavioural intention.

Objective 4: To propose strategies for minimising consumer-generated food waste in the restaurant industry based on empirical findings.

Objective 4 was addressed in the recommendations section where 5 concrete strategies were identified as a result of the empirical findings from the study. Each recommendation is based on the data, not on generic best practices, addressing social norms, the attitude-behaviour gap and behavioural barriers.

Conclusion

The current study is empirical and is based on the Theory of Planned Behaviour to examine consumer attitudes and behavioural intentions in the Indian restaurant industry in terms of food waste. A sample of

100 urban consumers was used, and all five hypotheses were accepted, indicating that all four types of factors (consumer awareness, behavioural, psychological and social) significantly influenced the attitudes of food waste, and that the consumers' attitude was a significant predictor of the willingness to adopt the practices of reducing food waste. Results indicate that there is a significant attitude-behaviour gap, which is explained mainly by social and cultural norms for eating out, by eating out too much and by the inconvenience of the waste-reduction actions to take. Social factors were found to be the strongest predictor, indicating a need for interventions that challenge the norms associated with the abundance of food, normalize using different portions, and make the use of leftovers a socially acceptable option. On an individual level, building personal responsibility and guilt-based motivation through carefully targeted awareness campaigns is the best way to close the gap between attitude and behaviour. Based on the established strong foundation of attitudes in this research, the suggestion is for restaurant operators and policymakers to take a convergent approach creating a menu engineering program, encouraging portion flexibility, implementing cues for visible waste reduction and educating consumers to encourage behavioural change. This research could be extended in the future with bigger stratified samples, longitudinal designs, and experimental testing of specific interventions at the restaurant level.

Appendix

SECTION A — Demographic Profile

1. Age

- 18 – 25 years
- 26 – 35 years
- 36 – 45 years
- 46 – 55 years
- Above 55 years

2. Gender

- Male
- Female
- Prefer not to say

3. How often do you dine out at restaurants?

- Daily
- 2–3 times a week
- Once a week
- 2–3 times a month
- Once a month or less

SECTION B — Consumer Awareness of Food Waste

Please indicate your level of agreement: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

No.	Statement	1	2	3	4	5
B1	I am aware that food waste is a serious environmental problem					

B2	I am aware that restaurants in India generate significant amounts of food waste daily					
B3	I know that uneaten food on my plate contributes to overall food waste					
B4	I am aware of the economic costs associated with food waste in the restaurant industry					
B5	I understand that reducing plate waste can positively impact the environment					

SECTION C — Consumer Attitude Towards Food Waste

Please indicate your level of agreement: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

No.	Statement	1	2	3	4	5
C1	I feel that wasting food in a restaurant is ethically wrong					
C2	I feel responsible for the amount of food I waste when dining out					
C3	I believe it is important to order only what I can finish at a restaurant					
C4	I think reducing food waste in restaurants should be a shared responsibility between consumers and restaurants					
C5	I feel that my dining choices can make a meaningful difference in reducing food waste					

SECTION D — Behavioural Factors

Please indicate your level of agreement: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

No.	Statement	1	2	3	4	5
D1	I often order more food than I can consume when dining at a restaurant					
D2	I tend to order a variety of dishes even when I know I may not finish all of them					
D3	I usually select portion sizes without considering how much I can actually eat					
D4	I rarely carry leftover food home after dining at a restaurant					
D5	I find it inconvenient to ask for leftover food to be packed when dining out					
D6	My food ordering habits at restaurants often result in uneaten food on my plate					

SECTION E — Psychological Factors

Please indicate your level of agreement: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

No.	Statement	1	2	3	4	5
E1	I feel guilty when I leave food uneaten on my plate at a restaurant					
E2	I am conscious about the environmental impact of the food I waste when dining out					
E3	I feel that my concern for the environment influences how mindfully I order food at a restaurant					
E4	I believe reducing food waste is a personal responsibility when dining out					
E5	I am confident that I can make mindful food choices to minimise waste when dining out					

E6	The thought of wasting food makes me uncomfortable even in a restaurant setting					
----	---	--	--	--	--	--

SECTION F — Social Factors

Please indicate your level of agreement: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

No.	Statement	1	2	3	4	5
F1	The people I dine with influence the amount of food I order at a restaurant					
F2	I feel social pressure to order generously when dining with others					
F3	I feel uncomfortable asking for smaller portions when dining with a group					
F4	Expectations of serving abundant food during social occasions influence my ordering behaviour at restaurants					
F5	I feel embarrassed asking for a parcel of leftover food in front of others					
F6	Social occasions such as celebrations or gatherings lead me to order more food than necessary					

SECTION G — Willingness to Adopt Waste Reduction Practices

Please indicate your level of agreement: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

No.	Statement	1	2	3	4	5
G1	I am willing to consciously order only what I can consume to avoid plate waste					
G2	I would ask for a parcel of leftover food if it were made easily available by the restaurant					
G3	I would choose a restaurant that actively promotes and practices food waste reduction					
G4	I am willing to opt for smaller portion sizes if offered as a menu option					
G5	I would participate in restaurant-led awareness initiatives aimed at reducing food waste					
G6	I am willing to modify my ordering behaviour to contribute to reducing food waste					