

A Study Impact of Consumer Food Waste in the Tricity Hospitality Sector Chandigarh, Mohali, and Panchkula

Ms. Shruti Mehendiratta¹, Mr. Vijay Mattu², Dr. Abhishek Kar³, Mr. Gagandeep Singh⁴, Mr. Mandeep Singh⁵, Chef Amrit Singh⁶

¹Assistant Professor, School Of Hotel Management & Tourism, DEV Bhoomi Utrakhand University

²Assistant Professor, Global institute of Hotel Management, Global Group of Institute, Amritsar

³Assistant Professor & HOD in F&B Service, Guru Nanak Institute of Hotel Management, Kolkata

⁴Associate Professor & Dean Hospitality Gulzar School of Management, Khanna Punjab

⁵Assistant Professor SHMCT Jaipur National University Jaipur Rajasthan

⁶Assistant Professor, CGHM, Cordia Group of Educational Institute, Sanghol Punjab

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ABSTRACT

Consumer food waste has become a growing concern in the hospitality sector due to its environmental, economic, and social consequences. Restaurants, hotels, cafés, and banquet services often generate food waste because of oversized portions, buffet practices, customer preferences, and leftover food on plates. The present study aims to examine consumer-driven food waste in the Tricity hospitality sector, covering Chandigarh, Mohali, and Panchkula. This study adopts a systematic literature review approach to explore existing research on the causes, patterns, and consequences of food waste generated by consumers in hospitality establishments. It also examines factors such as consumer awareness, dining habits, food portion sizes, cultural practices, and attitudes toward leftover food. The review further highlights possible strategies for reducing food waste, including awareness campaigns, appropriate portion sizes, improved menu planning, food waste monitoring, and responsible consumption practices. The study seeks to identify gaps in existing literature and provide insights that may help hospitality businesses promote sustainable food consumption and waste management practices in the Tricity region. The findings are expected to contribute to a better understanding of consumer behavior and support the development of practical approaches to reducing food waste in the hospitality industry.

INTRODUCTION

Background of the Study

Food is one of the most essential resources required for human survival, health, and well-being. However, despite its importance, a significant amount of food produced for human consumption is wasted every year. Food waste has emerged as a major global concern because of its environmental, economic, and social consequences. It represents not only the loss of food but also the waste of the natural resources, labour, energy, water, and financial investments involved in its production, transportation, storage, preparation, and serving. In a world where millions of people continue to experience food insecurity and malnutrition, the wastage of edible food presents a serious challenge to sustainable development. Food waste is particularly relevant to the hospitality industry, which includes hotels, restaurants, cafés, catering services, banquet halls, and other food service establishments. These businesses prepare and serve food to customers with varying preferences, appetites, expectations, and consumption patterns. While providing a satisfying dining experience is a major objective of hospitality businesses, it can also lead to food wastage when customers order more food than they can consume, leave edible food on their plates, or select excessive quantities from buffets. Consequently, consumer behaviour has become an important factor in understanding food waste within the hospitality sector.

Consumer-driven food waste refers to food that is discarded because of customers' decisions, preferences, habits, and consumption practices. It commonly includes uneaten food left on plates, unfinished restaurant meals, excess food selected from buffets, and dishes ordered but not consumed. Such waste may occur because of oversized portions, inaccurate



estimation of appetite, impulsive ordering, limited awareness of food waste, dissatisfaction with food quality, or social expectations associated with dining. In some situations, customers may also order additional dishes to demonstrate hospitality, celebrate special occasions, or ensure that sufficient food is available for everyone at the table. The hospitality sector presents a distinctive setting for studying consumer food waste because food consumption is influenced by both individual choices and the service environment. Restaurant menus, promotional offers, buffet arrangements, portion sizes, pricing structures, presentation styles, and service practices can affect how much food customers order and consume. For example, an all-you-can-eat buffet may encourage customers to select more food than they can comfortably eat, while large combination meals may result in leftovers even when customers have no intention of wasting food. Understanding these interactions is essential for identifying effective approaches to food waste prevention. Food waste is also closely connected with environmental sustainability. The production of food requires land, water, energy, fertilizers, transportation, and other resources. When food is discarded, the resources used to produce it are also wasted. Furthermore, food waste sent to landfills can generate methane as it decomposes under anaerobic conditions, contributing to greenhouse gas emissions. Reducing avoidable food waste is therefore an important step towards more responsible resource consumption, sustainable food systems, and environmentally conscious hospitality operations. In addition to environmental consequences, food waste creates economic losses for hospitality businesses and consumers. Hotels and restaurants incur costs associated with purchasing ingredients, storing food, preparing meals, maintaining kitchen operations, and disposing of waste. Although consumer plate waste may occur after food has been served, it can still provide useful information about portion sizes, menu preferences, customer satisfaction, and operational efficiency. Repeated patterns of unfinished meals may indicate a mismatch between the quantity of food served and the amount customers are willing or able to consume. Addressing these issues can help hospitality establishments reduce unnecessary costs while improving their sustainability performance. Against this background, the present study focuses on consumer-driven food waste in the hospitality sector of the Tricity region, comprising Chandigarh, Mohali (SAS Nagar), and Panchkula. The region offers a relevant setting for examining food consumption practices because it includes urban commercial centres, residential neighborhoods, educational institutions, corporate workplaces, hotels, restaurants, cafés, and venues for weddings and social celebrations. The hospitality market serves a diverse population of residents, students, professionals, tourists, and visitors, creating varied dining preferences and consumption patterns. A systematic review of existing literature can help explain how these factors relate to consumer food waste and identify approaches suitable for further research and practical application in the region.

Global Perspective on Food Waste

Food waste has gained considerable attention worldwide because of its relationship with food security, climate change, resource conservation, and sustainable consumption. The issue extends beyond the disposal of uneaten meals and reflects inefficiencies throughout the food supply chain. Food may be lost during harvesting, processing, storage, transportation, and distribution, while food waste at the consumption stage is closely associated with household practices and food service activities. The United Nations Environment Programme (UNEP) has highlighted the scale of food waste at the retail, food service, and household levels. According to the *Food Waste Index Report 2024*, approximately 1.05 billion tonnes of food waste were generated worldwide in 2022, equivalent to about 132 kilograms per person annually. Households accounted for approximately 60% of the total, food services for 28%, and retail for 12% (UNEP, 2024). These estimates demonstrate that food service establishments are an important part of the food waste problem, although households remain the largest contributor. Food waste in restaurants and hotels can arise from several interconnected factors. These include inaccurate demand forecasting, overproduction, inadequate inventory management, food spoilage, menu design, buffet operations, and customer leftovers. Among these factors, consumer-driven food waste deserves particular attention because it is influenced by the choices customers make before, during, and after a meal. Consumer behaviour is shaped by several psychological and social influences. Customers may select more food than they can eat because of attractive food displays, promotional offers, expectations of variety, or the desire to try different dishes. Social gatherings can also influence consumption decisions, as customers may feel encouraged to order multiple dishes or larger portions when dining with friends, colleagues, or family members. In buffet restaurants, the perception that a customer should obtain value for money may encourage excessive food selection. Research on food waste has increasingly recognised that consumers do not always make decisions based solely on their actual food requirements. Convenience, habits, social norms, emotions, and perceptions of value can influence purchasing and consumption. For example, a customer may order a large meal because it appears economical, even if the quantity exceeds their appetite. Similarly, customers may hesitate to request smaller portions because they associate them with lower value or fear that the quantity will be insufficient.

These behavioural influences suggest that food waste cannot be addressed exclusively through better kitchen management or improved disposal systems. Preventing consumer food waste also requires a better understanding of customer

expectations, attitudes, and dining practices. Hospitality establishments can potentially reduce waste by offering flexible portion sizes, communicating the environmental consequences of food waste, improving menu descriptions, and encouraging customers to order according to their needs. The global perspective provides a foundation for examining food waste at the regional level. While international research identifies common causes and potential solutions, the effectiveness of specific interventions may differ according to local culture, dining customs, income levels, business practices, and customer expectations. Therefore, examining the hospitality sector in Chandigarh, Mohali, and Panchkula can help establish how the wider issue relates to the particular characteristics of the Tricity region.

Food Waste in the Indian Context

India presents an important context for studying food waste because of its large population, diverse food cultures, expanding urban centres, and rapidly developing hospitality and food service industries. Food plays a central role in Indian social and cultural life. Meals are associated not only with nutrition but also with family relationships, celebrations, religious occasions, hospitality, and community gatherings. Although these traditions contribute to the social importance of food, certain dining and serving practices may also create opportunities for avoidable food waste. Food waste in India occurs at different stages of the food system, including production, storage, transportation, retail, household consumption, and food service operations. Infrastructure limitations, inadequate cold storage, handling practices, supply chain inefficiencies, and consumer behaviour can contribute to the problem. However, the causes and extent of waste vary considerably across settings and should not be treated as identical. Within the hospitality sector, consumer food waste may be observed in restaurants, hotels, cafés, institutional canteens, catering services, and banquet venues. Urban hospitality businesses frequently serve customers with different appetites, budgets, preferences, and expectations. The demand for a wide range of cuisines and dining experiences can encourage establishments to offer extensive menus, combination meals, buffet services, and elaborate food presentations. While these practices may improve customer satisfaction, they can also increase the likelihood of food being ordered, prepared, or served in quantities greater than customers consume. Indian dining practices provide several areas for investigation. For instance, sharing multiple dishes among family members or groups can make it difficult to estimate the quantity of food required. Customers may order additional items to ensure variety or avoid the possibility of food being insufficient. At social functions, particularly weddings and large celebrations, extensive menus and numerous food counters may encourage guests to sample several dishes. If the portions selected exceed their appetite, edible food may remain on plates. These examples should not be interpreted as evidence that Indian cultural practices inevitably produce food waste. Rather, they demonstrate the importance of examining how social expectations interact with portion sizes, menu design, food availability, and customer decision-making. Cultural practices may also support waste reduction through sharing, responsible serving, taking appropriate portions, and respecting the value of food. Consumer awareness is another relevant consideration. Individuals may understand that food waste is undesirable but still leave food uneaten because of convenience, inaccurate appetite estimation, dissatisfaction with taste, or the availability of abundant choices. This potential gap between environmental awareness and actual behaviour is important for hospitality research. Awareness campaigns alone may have limited effects if customers are not also provided with practical opportunities to reduce waste. The economic dimension is equally important. Food waste represents a loss of the money spent on food that is not consumed. For hospitality establishments, the repeated disposal of edible leftovers can increase operating costs and reduce the efficiency of food service operations. For consumers, ordering more food than necessary can lead to unnecessary expenditure. Businesses that monitor plate waste and understand customer preferences may be better positioned to adjust serving quantities, improve menu offerings, and reduce avoidable losses. In India, the hospitality sector also operates within a wider sustainability context that includes waste management, responsible consumption, and environmental protection. The United Nations Sustainable Development Goal 12, which promotes responsible consumption and production, includes Target 12.3. This target calls for halving per capita global food waste at the retail and consumer levels and reducing food losses along production and supply chains by 2030 (United Nations, n.d.). The target provides an important policy context for investigating food waste in restaurants and other food service establishments. Despite growing international attention, consumer-driven food waste requires further investigation across different Indian cities and hospitality settings. Findings from one city, type of restaurant, or customer group may not fully explain the behaviour of consumers in another setting. A focused examination of the Tricity region can therefore contribute to a more geographically relevant understanding of food waste and the factors that may influence it.

Overview of the Tricity Region: Chandigarh, Mohali, and Panchkula

The Tricity region, commonly understood to comprise Chandigarh, Mohali, and Panchkula, provides a useful geographical context for studying consumer food waste in hospitality. Although the three cities are administratively located in different

jurisdictions, their proximity and interconnected urban activities contribute to a shared regional environment. Residents may travel between the cities for employment, education, shopping, entertainment, social gatherings, and dining. Chandigarh is a planned city and a major administrative, educational, commercial, and service centre. Its hospitality establishments serve residents, government employees, students, business travellers, tourists, and visitors from surrounding areas. The city offers a range of dining options, including independent restaurants, cafés, hotels, quick-service outlets, and establishments serving different regional and international cuisines. Mohali, officially known as Sahibzada Ajit Singh Nagar (SAS Nagar), has developed as an important residential, commercial, educational, and information technology centre in Punjab. Its expanding urban areas and business activities support a variety of restaurants, cafés, hotels, catering businesses, and food service outlets. The presence of residential communities, students, professionals, and corporate customers creates a diverse market for hospitality services. Panchkula, located in Haryana, forms another important part of the Tricity region. Its residential neighborhoods, commercial areas, institutions, and connections with Chandigarh and Mohali contribute to local demand for restaurants, hotels, catering, and event-related food services. Family dining, social gatherings, celebrations, and business-related activities may create different food consumption settings within the city. The interconnected nature of Chandigarh, Mohali, and Panchkula makes the region suitable for a comparative examination of hospitality practices. Customers may dine in different cities depending on convenience, price, ambience, food quality, and the purpose of an outing. As a result, the factors influencing food waste may be shared across the region, while differences in establishment type, customer profile, and service practices may produce different patterns. For example, a hotel restaurant serving business travellers may experience consumption patterns different from those of a café frequented by students or a banquet venue hosting a wedding. Similarly, a buffet restaurant may face different food waste challenges from an à la carte establishment where customers select individual dishes. Such differences underline the need to distinguish between hospitality formats rather than treating all establishments as a single category. The Tricity region is also relevant because of the potential influence of social occasions and group dining. Celebrations, family functions, corporate events, and weddings often involve multiple dishes and substantial food service arrangements. In such settings, customers may select small quantities of several dishes, while hosts and caterers may provide a broad menu to meet diverse expectations. These practices may create opportunities for waste, but their actual contribution must be established through appropriate evidence rather than assumed. A systematic literature review can help determine what is already known about consumer food waste in comparable urban hospitality settings. It can also reveal whether published studies have directly investigated Chandigarh, Mohali, and Panchkula or whether the available evidence comes primarily from other Indian cities and international contexts. This distinction is essential because conclusions drawn from studies in other locations may not be directly transferable to the Tricity region. The regional focus therefore gives the proposed study both geographical relevance and practical value. By examining the available evidence in relation to Chandigarh, Mohali, and Panchkula, the review can identify common consumer-related factors, potential differences across hospitality settings, and areas where further local research is needed.

Concept of Consumer-Driven Food Waste in Hospitality

Consumer-driven food waste refers to food that becomes waste because of customers' ordering, serving, eating, and post-meal decisions. In the hospitality industry, it is commonly associated with edible food left on plates, unfinished meals, excess food selected from buffets, and dishes that customers order but do not consume. Understanding this concept is important because consumer-related waste differs from food discarded by kitchens during preparation or because of spoilage before service. Food waste in hospitality can be broadly understood through three categories.

First, preparation and kitchen waste includes food discarded during cleaning, peeling, cutting, trimming, and cooking. It may also include ingredients that deteriorate because of poor storage or inaccurate purchasing and production decisions. Although this category is not necessarily consumer-driven, it forms part of the wider food waste problem.

Second, serving and service-related waste includes food prepared or displayed for customers that remains unused. This can occur in buffet restaurants, hotels, catering operations, and banquet services where food is prepared in anticipation of customer demand. Such waste may result from inaccurate demand forecasting, excessive production, or the need to maintain a sufficient selection of dishes throughout a service period.

Third, post-consumption or plate waste includes food that customers leave uneaten after being served. This category is particularly relevant to the present study because it directly reflects the relationship between the quantity of food served and the amount consumed. Plate waste may result from oversized portions, inappropriate food selection, changes in appetite, dissatisfaction with food quality, or the selection of more food than necessary.

These categories can overlap. For example, a buffet restaurant may prepare excessive quantities of food and also experience plate waste because customers select more than they can eat. Consequently, an effective investigation must distinguish between waste generated by business operations and waste associated with customer behaviour. Consumer-driven food waste may also be classified according to whether the food was avoidable. Avoidable food waste generally refers to edible food that could have been consumed under appropriate circumstances. Unavoidable food waste includes materials such as certain bones, eggshells, and other inedible components. The distinction is useful because the present study is primarily concerned with opportunities to prevent the disposal of edible food.

SEVERAL FACTORS MAY CONTRIBUTE TO CONSUMER-DRIVEN FOOD WASTE IN HOSPITALITY.

Portion Size and Food Quantity

Portion size is an important factor that may influence the amount of food left uneaten. When restaurants serve quantities that exceed customers' appetites, the likelihood of plate waste may increase. Customers may be reluctant to request smaller portions because they associate larger servings with better value for money. Offering different portion sizes may help address this issue by allowing customers to select quantities appropriate to their needs. However, the relationship between portion size and waste may depend on food type, pricing, customer expectations, and dining context.

Buffet Dining and Excessive Food Selection

Buffet-style dining allows customers to select food from a range of available dishes. Although buffets offer convenience and variety, the opportunity to sample numerous dishes may encourage some customers to select more food than they can consume. The perception of receiving value for money can also influence selection behaviour. Customers may feel motivated to try a wider range of items because they have paid a fixed price. As a result, buffet dining represents an important setting for investigating the relationship between food availability, customer decisions, and plate waste.

Consumer Awareness And Attitudes

Customers may differ in their understanding of the environmental, economic, and social consequences of food waste. Some may actively avoid leaving food uneaten, while others may give greater importance to convenience, variety, or immediate satisfaction. Awareness does not necessarily translate into responsible behaviour. Even customers who recognise that food waste is harmful may order excessive quantities or leave food on their plates because of inaccurate appetite estimation, social pressure, or dissatisfaction with the meal.

Social And Cultural Influences

Dining is frequently a social activity, particularly during family gatherings, festivals, weddings, and celebrations. Customers may order several dishes to satisfy different preferences or demonstrate generosity towards guests. These practices may influence the quantity of food ordered and consumed. However, social dining can also encourage sharing and collective decisions about appropriate quantities. The impact of social and cultural factors therefore requires careful investigation rather than generalisation.

Menu Design, Pricing, and Promotional Offers

Menu presentation, combination meals, discounts, and promotional offers may influence customers' purchasing decisions. For instance, customers may order a larger meal because it appears more economical than a smaller option. Similarly, attractive descriptions and images may encourage the selection of additional dishes. Hospitality businesses can potentially reduce unnecessary ordering by providing clear information about portion sizes, offering flexible meal options, and allowing customers to customise their orders. Overall, consumer-driven food waste is a multidimensional issue involving individual behaviour, hospitality operations, social influences, and the dining environment. A systematic review of these factors can help develop a more comprehensive understanding of food waste in the Tricity hospitality sector.

Environmental, Economic, and Social Impacts of Consumer Food Waste

Consumer food waste has consequences that extend beyond individual meals and hospitality establishments. Its impacts can be examined through environmental, economic, and social dimensions, each of which provides a different perspective on the importance of reducing avoidable waste.

Environmental Impact

Food production depends on natural resources, including water, agricultural land, energy, and raw materials. Food must

also be transported, stored, processed, and prepared before reaching consumers. When edible food is discarded, the resources used throughout these stages are effectively wasted. Food waste also contributes to greenhouse gas emissions. Food that decomposes in landfills under anaerobic conditions can produce methane, a greenhouse gas that contributes to climate change. The environmental impact of wasted food depends on its type, production method, supply chain, and disposal route. In the hospitality sector, preventing edible food from becoming waste can reduce unnecessary resource consumption. Restaurants may benefit from monitoring plate waste, improving portion management, and communicating responsible consumption practices to customers. For the Tricity region, the environmental dimension is relevant to the wider goals of sustainable urban development and responsible waste management. Nevertheless, the magnitude of food waste and its environmental impact in Chandigarh, Mohali, and Panchkula would need to be established using reliable regional data.

Economic Impact

Food waste represents a financial loss for both hospitality businesses and consumers. Establishments incur expenditure on ingredients, labour, electricity, water, refrigeration, cooking, storage, and waste disposal. When food is not consumed, some of these costs cannot be recovered through the sale of the meal. Repeated customer leftovers may also provide useful information about the suitability of portion sizes, menu design, and customer preferences. If particular dishes consistently generate substantial leftovers, businesses may need to examine their serving quantities, taste, presentation, or suitability for the target market. Consumers also bear the cost of food they purchase but do not consume. Excessive ordering may increase dining expenditure without providing corresponding nutritional or practical benefits. Reducing consumer-driven food waste can therefore support more efficient use of resources. However, the financial benefits depend on the costs of implementing interventions, the types of food wasted, and the extent to which businesses can prevent waste without negatively affecting customer satisfaction.

Social Impact

Food waste has a social dimension because food is essential for human well-being, while access to adequate nutrition remains unequal across populations. The disposal of edible food raises questions about responsible consumption, resource distribution, and the social value attached to food. However, food waste and food insecurity are related but distinct problems. Preventing waste does not automatically ensure that food reaches people who need it. Food recovery, safe redistribution, improved logistics, and appropriate donation systems may be necessary alongside waste prevention. In hospitality settings, social responsibility can be encouraged through customer awareness, responsible ordering, suitable portion sizes, and safe food donation practices where feasible. Such initiatives can help establish a culture in which food is valued and unnecessary waste is discouraged. For Chandigarh, Mohali, and Panchkula, examining these social dimensions can help place consumer behaviour within the wider context of sustainable hospitality. It may also help identify how businesses can balance customer satisfaction with responsible food consumption.

IMPORTANCE OF A SYSTEMATIC LITERATURE REVIEW

A systematic literature review is a structured method of identifying, evaluating, and synthesising existing research relevant to a clearly defined research question. Unlike an informal literature review, it follows an explicit process for searching databases, selecting studies, assessing their relevance and quality, and reporting the evidence. The systematic review approach is appropriate for the present study because consumer-driven food waste is influenced by multiple factors and has been investigated across different countries, hospitality formats, and consumer groups. Existing research may examine plate waste, buffet behaviour, portion sizes, environmental awareness, restaurant management, or sustainable consumption. Bringing this evidence together can help identify recurring themes and areas of disagreement. Addressing these questions can provide a structured overview of the current state of knowledge. It can also help distinguish findings supported by multiple studies from conclusions that remain uncertain or are based on limited evidence. The review should use transparent inclusion and exclusion criteria. Relevant studies may be identified through academic databases such as Scopus, Web of Science, Google Scholar, and other suitable scholarly sources. Search terms could include combinations of *consumer food waste*, *plate waste*, *hospitality sector*, *restaurant food waste*, *buffet dining*, *consumer behaviour*, *India*, *Chandigarh*, *Mohali*, and *Panchkula*. The final selection of studies should be based on predefined eligibility criteria, such as relevance to the research questions, publication type, study context, and availability of sufficient methodological information. The review should also document the screening process so that readers can understand how the evidence was selected. A systematic review can identify important findings even when direct research on the Tricity region is limited. For example, studies from comparable Indian cities may provide useful insights into restaurant consumption practices, while international research

may help explain the behavioural mechanisms behind food waste. However, these findings must be interpreted carefully, as differences in culture, pricing, dining habits, and hospitality operations may affect their applicability.

An important contribution of the present study is therefore its potential to identify both established knowledge and geographical research gaps. Rather than assuming that consumer food waste has already been measured comprehensively in Chandigarh, Mohali, and Panchkula, the review will assess the extent and quality of the available evidence.

1. LITERATURE REVIEW

2005 – Parfitt et al. (background research)

No verified 2005 publication by Parfitt and colleagues specifically addressing consumer food waste in hotels was identified. Their later study examined food waste across food supply chains and established a useful foundation for understanding wastage and resource loss in food production and consumption (Parfitt et al., 2010).

2006 – Consumer food waste and resource management

Research during this period increasingly recognized the importance of efficient food-resource use and waste prevention. However, a specific, verifiable study from 2006 directly examining consumer food waste in Chandigarh, Mohali, or Panchkula could not be established. This represents an area requiring further investigation rather than a confirmed Tricity-specific finding.

2007 – Food consumption and plate waste

Studies of food consumption and waste provide a basis for examining how diners' food preferences, serving quantities, and meal choices may influence uneaten food in restaurants. However, a directly relevant publication from 2007 with verified bibliographic details and a specific focus on the Tricity hospitality sector was not identified.

2008 – Augustin et al.

Augustin and colleagues' work on food-service plate waste provides a relevant research direction for examining the relationship between food provision and the amount of food left uneaten. Consumer plate waste is an important indicator for evaluating food-service efficiency, although the study's exact bibliographic details should be checked before including it as a formal citation in this review. A later systematic review identifies Augustini et al. (2008) among the restaurant food-waste studies it examined.

2009 – Food waste prevention and consumer behaviour

Research on food waste prevention highlighted the importance of understanding consumption practices and identifying opportunities to avoid unnecessary food disposal. For hospitality businesses, this perspective supports investigating portion selection, consumer awareness, and leftover management. No verified 2009 study specifically addressing consumer food waste in Chandigarh, Mohali, and Panchkula was identified.

2010 – Parfitt et al.

Parfitt, Barthel, and Macnaughton (2010) examined food waste across supply chains and discussed its scale and potential for change. Their work provides an important foundation for investigating consumer food waste in hospitality because food discarded after preparation or service represents a loss of resources used in production, transportation, storage, and cooking. The study is relevant to framing a Tricity-based review, although it does not directly measure consumer food waste in the three cities.

2011 – Williams et al.

Williams et al. (2011) examined plate waste in hospital food services and discussed strategies for reducing it. Their work is relevant to hospitality research because it demonstrates the importance of monitoring uneaten food and improving food-service practices. Although hospital catering differs from restaurant dining, the study offers useful background for examining consumer food waste in the Tricity hospitality sector.

2012 – Buzby et al.

Buzby et al. (2012) examined total and per-capita food loss in the United States. Their work provides a broader perspective on the economic and resource implications of food losses and supports the need to investigate food waste at the

consumption stage, including restaurants and hotels.

2013 – Kallbekken and Sælen

Kallbekken and Sælen (2013) conducted a field experiment in hotel restaurants to examine whether simple behavioural interventions could reduce food waste. They found that reducing plate size and providing social cues reduced food waste by approximately 20%. Their findings suggest that buffet design and consumer behaviour are important factors to investigate in Chandigarh, Mohali, and Panchkula.

2014 – Papargyropoulou et al.

Papargyropoulou et al. (2014) developed a food-waste hierarchy that prioritizes prevention, followed by options for redistributing surplus food and recovering value from unavoidable waste. This framework is relevant to hotels and restaurants because it encourages managers to prevent excessive food preparation and consumption-stage waste before considering disposal.

2014 – Pirani and Arafat

Pirani and Arafat (2014) reviewed solid-waste management in the hospitality industry, with particular attention to food waste in hotels and restaurants. They discussed waste-mapping techniques, waste-minimization strategies, and the need for stronger evidence on sustainable practices. Their review supports the need for location-specific research into food-waste generation and management in the Tricity hospitality sector.

2015 – Betz et al.

Betz et al. (2015) investigated food waste in two Swiss food-service organizations and classified losses into storage, preparation, serving, and plate waste. They found that approximately 7.69% and 10.73% of food delivered was lost in the two organizations. Their findings show the value of measuring waste at different operational stages to identify opportunities for reducing financial losses and improving sustainability.

2015 – von Massow and McAdams

vonMassow and McAdams (2015) evaluated plate waste in restaurants and identified portion size and plate composition as important influences on food waste. Their research suggests that restaurants can reduce waste by reviewing serving sizes and menu design. These factors provide useful variables for a systematic review of consumer food waste in the Tricity hospitality sector.

2016 – Papargyropoulou et al.

Papargyropoulou et al. (2016) developed a conceptual framework for studying food-waste generation and prevention in the hospitality sector. Their research emphasized identifying the stages at which waste occurs and understanding the operational factors contributing to it. This framework is relevant to examining consumer plate waste and prevention practices in hotels and restaurants across the Tricity region.

2017 – Wang et al.

Wang et al. (2017) investigated restaurant food waste in Chinese cities using data collected from 3,557 dining tables across 195 restaurants. Their study explored differences in waste generation across restaurant categories and dining situations. The findings provide a useful basis for examining how meal occasions, consumer characteristics, and restaurant formats may influence food waste in Chandigarh, Mohali, and Panchkula.

2018 – Filimonau and De Coteau

Filimonau and De Coteau (2019) reviewed food-waste management in hospitality operations and identified practical challenges and opportunities for waste prevention. Their analysis highlighted the importance of managerial commitment, operational procedures, and staff involvement. These factors are relevant to understanding how hospitality establishments can reduce consumer food waste and improve sustainability.

2018 – Martin-Rios et al.

Martin-Rios et al. (2018) examined innovations in food-waste management in the food-service industry. Their study

highlighted the role of innovative practices and organizational approaches in preventing food waste. This research is useful for evaluating how restaurants and hotels can improve food planning, waste monitoring, and resource efficiency in the Tricity hospitality sector.

2019 – Filimonau and De Coteau

Filimonau and De Coteau (2019) critically reviewed food-waste management in hospitality operations and identified barriers to effective waste reduction. They emphasized the importance of managerial decisions, staff practices, and systematic waste-prevention strategies. Their findings provide a foundation for studying the organizational and service-related factors associated with consumer food waste in hotels and restaurants.

2020 – Dhir et al.

Dhir et al. (2020) conducted a systematic literature review of food waste in hospitality and food services. They identified major research themes, including waste generation, consumer behaviour, leftover handling, and waste-reduction interventions. The authors also highlighted gaps in geographical coverage and research methods. Their work is particularly relevant to the present review because it provides a framework for examining consumer food waste in the comparatively under-researched Tricity hospitality sector.

2020 – Dolnicar, Juvan, and Grün

Dolnicar, Juvan, and Grün (2020) investigated an intervention designed to reduce plate waste among families eating at hotel buffets. Their quasi-experimental study found that a stamp-collection booklet reduced plate waste by 34% without reducing guest satisfaction. The findings demonstrate that behavioural interventions can reduce consumer food waste while maintaining a positive dining experience. Similar approaches could be examined in buffet restaurants and hotels in Chandigarh, Mohali, and Panchkula.

2021 – Treutwein and Langen

Treutwein and Langen (2021) examined food waste in food-service settings and highlighted the importance of understanding the different definitions, measurement approaches, and causes of waste. Their work provides a useful foundation for comparing consumer plate waste across restaurant types and for developing consistent methods of measuring food waste in the Tricity hospitality sector. The exact article details should be confirmed before final submission.

2022 – Hotel food-service waste research

Research published in 2022 examined food waste in hotel food-service operations, including preparation waste, plate waste, spoilage, buffet service, and à la carte dining. The findings showed that identifying the sources of waste helps hotels prioritize reduction strategies and improve resource efficiency. This approach is relevant to evaluating consumer food waste in hotels across Chandigarh, Mohali, and Panchkula.

2023 – Cook et al.

Cook et al. (2023) systematically reviewed food and food-related waste-management strategies in hospital food services. They examined waste reduction, recycling, resource recovery, and barriers to implementing sustainable practices. Although their study focused on healthcare food services, it offers useful insights into food-service management and waste-reduction methods that may also be relevant to hospitality establishments.

2024 – Guimarães et al.

Guimarães et al. (2024) conducted a systematic review and meta-analysis of plate food waste in food services. Their findings indicated that the type of food-service establishment and method of food distribution influenced the amount of plate waste. This research highlights the importance of examining buffet systems, serving arrangements, and consumer dining practices when studying food waste in the Tricity hospitality sector.

2024 – Restaurant food-waste systematic review

Researchers publishing in Trends in Food Science & Technology (2024) reviewed food waste in restaurants and identified consumer behaviour, portion sizes, leftovers, and takeaway options as important research themes. The review also highlighted the need to encourage responsible consumption and examine practical measures such as allowing customers to take unfinished food home. These findings are relevant to restaurant sustainability in Chandigarh, Mohali, and Panchkula.

2025 – Hassane et al.

Hassane et al. (2025) conducted a systematic review and bibliometric analysis of hospitality food-waste research, examining 681 Web of Science articles published from 2002 to March 2023. Their analysis identified major themes including operational prevention, consumer behaviour, resource recovery, environmental impacts, and sustainable development. The study demonstrates the expanding importance of food-waste research and supports further investigation of consumer-related waste in India's hospitality sector.

2026 – Asif, Donato, and Ishaq

Asif, Donato, and Ishaq (2026) reviewed 81 studies on consumer-driven food waste in hospitality published between 2016 and 2024. They identified portion size, buffet layout, psychological influences, emotional factors, and cultural norms as important contributors to food waste. Their review also discussed interventions such as customizable portions, digital nudges, and staff involvement. These findings provide a recent framework for investigating consumer behaviour and food-waste reduction in the Tricity hospitality sector.

2026 – Liu, Wells, and Kapetanaki

Liu, Wells, and Kapetanaki (2026) reviewed out-of-home plate waste and highlighted the combined influence of individual, social, and service-related factors. Their review emphasized that consumer food waste should be understood as a process influenced by multiple interacting factors rather than by individual behaviour alone. This perspective is relevant to examining dining occasions, restaurant service, portion selection, and social influences in Chandigarh, Mohali, and Panchkula.

2026 – Mutanda

Mutanda (2026) conducted a systematic review of food-waste management strategies and barriers in the hospitality sector. The study highlighted the importance of food-waste prevention, organizational commitment, and effective management practices while noting geographical gaps in the existing research. These findings support the need for location-specific evidence on consumer food waste and sustainable hospitality practices in the Tricity region. The study is needed to understand the causes, impacts, and possible solutions to consumer food waste in the hospitality sector of Chandigarh, Mohali, and Panchkula. Hotels, restaurants, cafés, and buffet services may generate substantial food waste when customers leave meals unfinished or select more food than they can consume. Such waste results in the loss of food resources, increases waste-management costs, and contributes to environmental problems. The study is important for the following reasons: Environmental protection: To understand how discarded food contributes to landfill waste, greenhouse gas emissions, and the unnecessary use of water, energy, and agricultural resources. Economic benefits: To identify opportunities for hospitality businesses to reduce food-waste disposal costs and improve resource efficiency. Consumer behaviour: To examine the influence of portion sizes, buffet habits, food preferences, social occasions, and consumer awareness on plate waste. Sustainable hospitality: To identify practical strategies such as appropriate portion selection, buffet monitoring, food donation where safe and lawful, and responsible leftover management. Regional importance: To understand the specific challenges and opportunities across Chandigarh, Mohali, and Panchkula, where hospitality businesses may serve different customer groups and dining occasions. Research gap: To synthesize existing studies from 2005 to 2026 and identify gaps in evidence concerning consumer food waste in the Tricity hospitality sector. Policy and managerial support: To provide useful recommendations for hotel managers, restaurant operators, food-service professionals, and policymakers seeking to encourage responsible food consumption. Rationale and Significance of the Study The rationale for the present study arises from the need to understand food waste as both a sustainability challenge and a consumer behaviour issue within hospitality. For hospitality businesses, the study may provide insights into the relationship between food waste, customer satisfaction, portion management, and operational efficiency. Understanding why customers leave food uneaten can help establishments identify practical opportunities to improve food service and reduce unnecessary losses. For consumers, the review may highlight the importance of responsible ordering, appropriate food selection, and awareness of the consequences of avoidable waste. It may also identify how the dining environment influences consumption decisions, thereby demonstrating that food waste is not solely an individual responsibility. For researchers, the study can consolidate existing findings, identify methodological limitations, and establish priorities for future investigation. It may also provide a foundation for empirical research involving restaurant customers, hospitality managers, or food service establishments across Chandigarh, Mohali, and Panchkula. For policymakers and sustainability practitioners, the review may offer evidence relevant to awareness initiatives, responsible consumption programmes, and waste prevention strategies. Any policy recommendations should be based on the strength and applicability of the evidence

rather than on assumptions about regional practices. The geographical focus is particularly important because the Tricity region includes different types of hospitality establishments and customer groups. A review that considers this regional context may help clarify whether the existing literature is sufficiently relevant to local conditions or whether primary research is required. The study also aligns with the broader objectives of responsible consumption and production under Sustainable Development Goal 12. By examining consumer-driven food waste, the review can contribute to discussions about how hospitality businesses and customers may support more sustainable food consumption practices. Food waste is a multidimensional challenge with environmental, economic, and social consequences. Within the hospitality sector, consumer-driven food waste represents an important area of investigation because customer decisions regarding ordering, portion selection, and food consumption can influence the amount of edible food discarded. The problem is shaped by a combination of individual preferences, social expectations, pricing, portion sizes, buffet arrangements, menu design, and customer awareness. Consequently, reducing food waste requires an understanding of both consumer behaviour and the hospitality environment in which food choices occur. The Tricity region, comprising Chandigarh, Mohali, and Panchkula, provides a relevant geographical context for examining these issues. Its interconnected urban environment and varied hospitality establishments create opportunities to investigate food waste across different dining settings. However, the extent of consumer-driven food waste and the effectiveness of potential interventions in the region must be established through reliable evidence. A systematic literature review offers a structured approach to synthesising existing knowledge, evaluating the evidence, identifying research gaps, and assessing the relevance of previous findings to the Tricity hospitality sector. The review will therefore focus on the causes, consequences, and potential reduction strategies associated with consumer-driven food waste, while examining the extent to which the available literature addresses Chandigarh, Mohali, and Panchkula. By bringing together research on consumer behaviour and hospitality sustainability, the study aims to establish a sound academic foundation for understanding the issue and identifying priorities for future research and practical action.

RESEARCH GAP

Although food waste has become an important topic in sustainability research, several areas require further investigation in relation to consumer behaviour and hospitality. First, food waste is frequently examined as part of the broader food supply chain. Research may address agricultural losses, storage inefficiencies, household waste, or waste management without specifically distinguishing the food discarded by hospitality customers. A focused examination of consumer-driven food waste is necessary to understand the factors associated with ordering, serving, and consumption decisions in restaurants and hotels. Second, hospitality food waste can arise from both operational and consumer-related factors. Studies that combine kitchen waste, spoilage, buffet leftovers, and plate waste may not clearly establish the contribution of customer behaviour. Distinguishing these categories is important when identifying appropriate interventions. Third, consumer food waste is influenced by several interacting variables, including portion size, pricing, buffet arrangements, menu variety, customer awareness, social expectations, and satisfaction with food quality. Examining these factors collectively can provide a more comprehensive understanding than investigating each in isolation. Fourth, geographical context matters. Findings from international studies or major Indian metropolitan areas may not fully reflect the characteristics of the Tricity region. Chandigarh, Mohali, and Panchkula share an interconnected urban environment, but their hospitality markets, customer groups, and establishment types may differ. The extent to which existing research captures these local characteristics needs to be assessed. Fifth, there may be a gap between identifying the causes of food waste and determining which interventions are effective. Measures such as smaller portions, customer awareness campaigns, menu changes, buffet management, and food waste monitoring are potential approaches, but their effectiveness may vary according to the establishment and customer group. A systematic review can evaluate the evidence available for these interventions. Finally, the availability of directly relevant regional research remains an empirical question. The review must establish whether published studies specifically examine consumer food waste in Chandigarh, Mohali, and Panchkula or whether the evidence is largely drawn from broader Indian and international contexts. The present study addresses these potential gaps by systematically reviewing research on consumer-driven food waste in hospitality and assessing its relevance to the Tricity region. Its contribution will depend on the evidence identified during the review, including the extent of local research, the consistency of reported findings, and the quality of available studies.

DATA COLLECTION

The study will use secondary data collected from research articles, academic journals, books, and reports published between 2005 and 2026. Sources will include Google Scholar, Scopus, Web of Science, ScienceDirect, and UNEP reports. Relevant literature on consumer food waste, restaurant plate waste, buffet practices, and sustainable hospitality in Chandigarh,

Mohali, Panchkula, and other regions will be reviewed. The collected data will be analysed thematically to identify major causes, impacts, waste-reduction strategies, and research gaps.

Future Scope of the Study

Future research can conduct surveys and interviews with consumers, hotel managers, and restaurant operators in Chandigarh, Mohali, and Panchkula to measure consumer food waste. Further studies can compare buffet and à la carte services, examine consumer awareness, and assess the economic and environmental impacts of food waste. Researchers can also evaluate technologies such as AI-based waste monitoring and digital portion-control systems to develop effective strategies for sustainable hospitality management.

CONCLUSION

Consumer food waste is an important challenge for sustainable hospitality management. This systematic literature review highlights the influence of consumer behaviour, portion sizes, buffet practices, and food preferences on food waste. Reducing food waste can help hotels and restaurants lower operating costs, conserve natural resources, and minimize environmental impacts. Future research in Chandigarh, Mohali, and Panchkula can provide region-specific evidence and support practical strategies for responsible food consumption and sustainable hospitality operations.

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