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Research article

Silent leaks in the hospitality industry: A systematic scoping review on the food loss and waste

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ABSTRACT

Food loss and waste (FLW) is a global challenge, with the hospitality industry being the second largest contributor after households. In this study, existing research is systematically analyzed to assess the dimensions of FLW in the hospitality sector. To fill a gap in the literature, the study investigated dimensions of FLW using a systematic, structured and rigorous approach to literature analysis. A comprehensive search was conducted in Web of Science and Scopus according to PRISMA guidelines, which after screening yielded 40 relevant articles published between 2021 and 2025. The descriptive and thematic analysis shows that most studies focus on plate waste in local, independent restaurants, which generate more FLW compared to chain establishments. Vegetables were identified as the leading contributors, followed by carbohydrates and meat, with dinner buffets producing the largest amounts of waste. The study thus creates a knowledge base on FLW in the hospitality industry that is crucial for policy and practice and can therefore be used to monitor FLW frequently and take strategic control measures to minimize FLW and support the 2030 SDG agenda.

KEYWORDS

Buffet; food supply chain; restaurant; food security; food service

Introduction

Food Loss and Waste (FLW) is a critical global issue, estimated at 1.051 billion tons annually with the households leading (630 million tons), followed by the food service sector (290 million tons) and lastly the retail sector (131 million tons) (UNEP, 2024). Despite increasing global food consumption driven by population growth, FLW remains a mega challenge against the global attempts to achieve food security and directly threatens the UN's Sustainable Development Goal (SDG) 12.3 on responsible production and consumption (Antonschmidt & Lund-Durlacher, 2021; Okumus, 2025). In general, the global FLW in the hospitality's food service sector cannot be underestimated based on the magnitude and the impact it has on the general efforts in dealing with the current challenges of food security (Tomaszewska et al., 2021; Wang et al., 2022). The hospitality sector generates 290 million tons per year of FLW (UNEP 2024), which occurs along the general hospitality operations food supply chain; procurement, transportation, receiving, storage, issuance, food preparation and/or production, and lastly food service, which costs up to 80% of the food services' resources (Schulze et al., 2022). Rapid global expansion of restaurant chains, combined with rising urban dining habits, intensifies the scale of waste (Jia et al., 2024; Cousins et al., 2020). This, coupled with the present restaurant business expansion strategy across the international as well as local country-based brands, with chain hotels and restaurants spreading all over the world in an effort to increase market share, raises the urgent need for a concerted effort in order to curb the ever-increasing FLW (Jia et al., 2024; Cousins et al., 2020).

Furthermore, industrialization and urbanization has also led to an increase in the number of people eating out and therefore making hospitality food service sector more vibrant due to increased demand and thus a surge in FLW (Cousins et al. 2020; Wang et al., 2022). The general FLW has received global attention in

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research and innovation, with researchers carrying out a series of studies on the environmental and social impacts of FLW from a multidisciplinary perspective (Gustavsson et al., 2011; Pekerşen and Canöz, 2022). While many studies have been carried out on household as well as retail levels (Lins et al., 2021), research on hospitality remains fragmented and often emphasizes environmental rather than operational causes (Baul et al., 2021; Camilleri, 2025; Zhang et al., 2024). Existing findings suggest that plate waste, portion size, and buffet service are among major drivers, but comprehensive reviews of patterns and dimensions within hospitality are scarce (Ally et al., 2024; Filimonau & Sulyok, 2021). Ruppenthal and Rückert-John (2024) show that during the COVID-19 pandemic, German hospitality managers developed strategies such as reducing menu variety, donating food surpluses and extending the shelf life of products indirectly addressing the issue of FLW.

To address this gap, this study conducts a systematic scoping review of FLW in hospitality industry. Specifically, the following two research questions (RQs) were set: *RQ1*. What is the current state of research and publication on FLW in the hospitality industry? *RQ2*. What are the main dimensions of FLW in the hospitality industry? The aim of this study was therefore to analyse the existing knowledge and trends, as well as the main dimensions of FLW in the hospitality industry. In addition to its theoretical contribution and defining future research directions, this study indirectly addresses the problem of food security and availability worldwide and therefore has great practical and societal application and importance.

Methodology

An extensive systematic literature review was conducted for this study that met the requirements for a systematic literature review on FLW in the hospitality industry. The literature search was conducted according to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (Kitchenham & Brereton 2013; Tranfield et al., 2003). Therefore, based on the guidelines, there was undoubtedly a defined search strategy for exclusion and inclusion criteria and a clear description of the methodology. Although many databases are available to search for articles, the Scopus and Web of Science (WoS) databases were used for this review. These two databases were selected due to their comprehensive coverage, multidisciplinary nature and rigorous indexing standards for research articles (Martín-Martín et al., 2018; Kitchenham & Brereton 2013). The literature search was guided by key terms that emerged from the research questions of the study. These terms, which typically appear in titles, summaries and keywords, were defined on the basis of the researchers' expertise and refined after reviewing the relevant articles. In this study the terms "food loss" OR "food waste" OR "food wastage" OR "surplus food" OR "discarded food" OR "leftover food" was used to identify research articles that address these themes. Further, the selection was delimited with the string "hotel OR hotels OR restaurant OR restaurants OR "hospitality sector" OR "catering services" OR "food service" OR "commercial kitchens" OR "hospitality industry" OR "lodging industry" OR "hospitality business" in order to select articles particularly covering the larger hospitality industry.

Finally, for purposes of selecting research articles within the context of FLW, the selection was further delimited by the application of the string "reduction OR prevention OR management" The literature search was conducted through the selected databases on the 20th May 2025, which gave 86 results from the Scopus database and 740 from the WoS (826 in total). These were further filtered to include only research articles, conference proceedings and book chapters published in English. According to Nicholas et al. (2005), there is a varied output of research and publications based on the field of interest with papers in the hard science aging more quickly than in the social sciences and humanities of which aging slows down. Thus, obsolescence occurs within a duration of 5-10 years for the social sciences as well as humanities and thus for purposes of this study, the sampled articles were within the last five years to ensure a more current selection of articles (Nicholas et al., 2005). Accordingly, publications between the years 2021 to 2025 were selected, thus excluding obsolete research articles. Based on this search criteria, research reviews, conference abstracts and encyclopaedia related articles were excluded from the study selection (Table 1).

Table 1: Inclusion–exclusion criteria

Inclusion	Exclusion
Hospitality focused studies	Review articles
Articles published in English	Articles not published in English
Original research in peer-reviewed journals	Encyclopedia
Books and book chapters	Conference abstracts
Articles published between 2021 to 2025	Discussions
Scopus and Web of Science databases	Errata
	Short communications

Screening of the selected articles was thereafter narrowed to the titles of relevance, abstract, and key words. This process was aimed at removing irrelevant literature, thus ensuring that only relevant articles were

captured for the study. Thus, in order to arrive to the final research articles for consideration, they were further filtered to capture those relevant to the identified research questions, hence 40 articles were found to have successfully fulfilled the requirements through all the search processes and therefore were considered for a full review. The PRISMA flow chart of the research steps applied in this study was presented as shown in Figure 1.

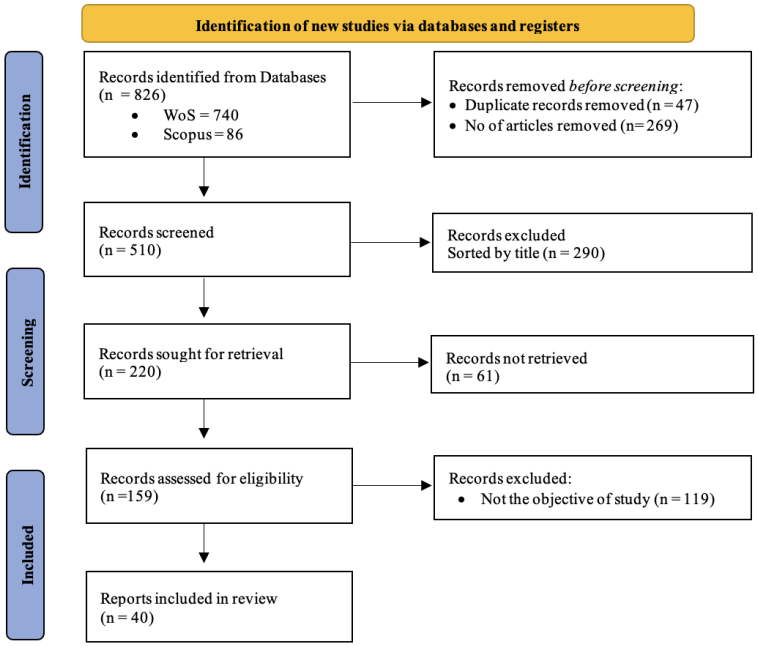

Figure 1: Flow chart of the research steps on FLW in the hospitality industry

The selected research articles were compiled into a dataset and organized in accordance to the author, year, journal, country, findings and FLW classification. In order to address RQ1, a descriptive analysis was conducted to examine the publication trends, including annual output and journal distribution. Further, the selected reports included in the review were downloaded and imported into ATLAS-ti 25 software for analysis and coding themes in order to establish how the studies in the selected articles are related and synthesizing the results, thus giving the word cloud. Finally, in order to establish the main dimensions of FLW on hospitality operations (RQ2), a qualitative thematic analysis on the selected research articles was carried out. The selected articles were thoroughly scrutinized and rigorously reviewed by the researcher with the aim of getting clarity on the content and thus correctly classifying the articles and extracting key information that would be used to answer the research questions. Based on the synthesis of data, the study results output was presented in accordance to the themes in line with the RQ2.

Results and discussion

Quantitative results

The number of article publications on FLW in hospitality shows notable variations across the period 2021-2025 (Figure 2). Further, 2024 recorded a total of 08 publications, 2022 (7 publications), 2023 (6 publications) and 2025 (3 publications) respectively. Thus, a downward trend is observed in the number of articles published over the years between 2021 and 2025. Though, based on these study results, the year 2025 could yield a higher number of publications as the articles were downloaded in late May, which was close to mid of the year 2025. The analysis of publication frequency revealed that Sustainability recorded the highest number of articles (9), followed by the Journal of Cleaner Production (5) and the Journal of Material Cycles and Waste Management (3). Four journals published two (2) articles each, while all remaining journals contained a single publication (Table 2). Studies carried out and documented cuts across disciplines that cover sustainable development, resources, conservation and recycling, material cycles and waste management and agronomy while hospitality industry core journals have less publication. Therefore, FLW research in hospitality has attracted the attention of academics from other fields, clearly demonstrating the multidisciplinary nature of FLW studies.

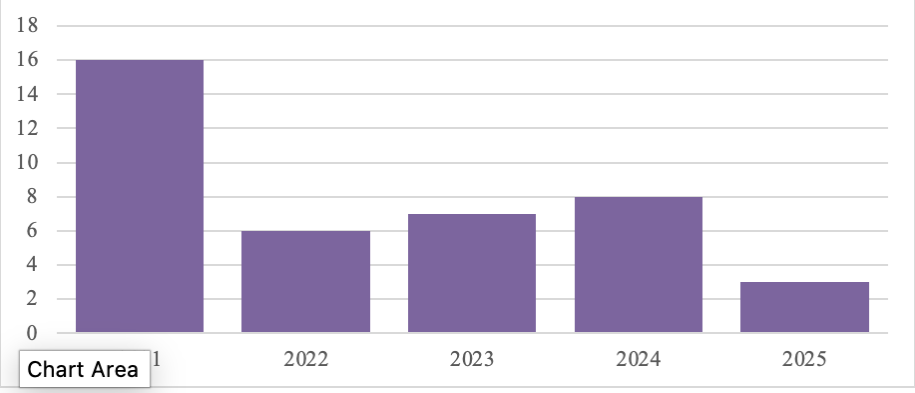

Figure 2: Frequency of articles publication per year (2021-2025)

Table 2: Frequency of article publication per journal

Journal	Count
Sustainability	9
Journal of Cleaner Production	5
Journal of Material Cycles and Waste Management	3
International Journal of Hospitality Management	2
Tourism Management Perspectives	2
Waste Management	2
Resources, Conservation & Recycling	2
Other journals	15

The study results shows that there is substantial research on the topic under investigations in the developed Countries, with very few studies from the under developed Countries. Even though many of the developed Countries are committed to ensure FLW is adequately addressed and therefore achieve a 50% reduction in FLW by 2030 (UNEP, 2024), there are still Countries from the same category that seems to be lagging on the same agenda in addition to the less developed and developing Countries. This explains why FLW has always been a persistent problem across the world. Moreover, it has been very difficult to gather current and relevant statistics on FLW not only in hospitality industry but in all other industries since an accurate FLW measurement is yet to be developed and thus applied across the world for uniformity purposes in related studies (Merian et al., 2024). In order to visualize and appreciate the core themes and frequently used terms, this study sought to establish the pattern and distribution of words in the selected articles for synthesis in relation to the study topic. Based on the word cloud output, the selected articles were found to have mainly focused on food and waste, even though this study sought to investigate on both food waste and food loss (Figure 3).

Figure 3: **Word Cloud on FLW**

This implies that there is minimal focus on food loss in the hospitality sector, may be because the words 'waste' and 'loss' could be used interchangeably, though with totally different meanings. Whereas waste refers to the inefficient utilization of food resources within the hotel industry leading to disposal of usable food products, loss denotes the reduction in value or quantity of ingredients and/ or food (Gustavsson et al., 2011). However, the word 'loss' was not captured at all, although more related words such as 'reduction, reduce or prevention' appear to have been utilized as depicted from the word cloud. Nonetheless, the selected articles captured 'business' related organizations as indicated by the word cloud. This could mean that the 'food waste' presented in this study were mainly generated from 'restaurant, hotels, kitchen, hospitality' related 'business' organizations, hence in line with the study objectives. Nevertheless, in relation to food waste, the terms used in the selected articles included 'buffet and plate service'. This signify that these are the recorded avenues of food waste in the hospitality industry.

Qualitative thematic analysis

In order to present a clear interpretation of the analysis on FLW within the hospitality's food service sector based on the study sample, four major categorizations of FLW were identified. These were classified according to the nature of FLW which were at operational level (purchasing, storage, preparation, holding for service, service and consumption), sectoral level (commercial catering) which include independent and dependent restaurants, as well as non-commercial or not for profit (catering sector), food type level (vegetables, starches, meats, drinks etc.), and at the meal level (breakfast, lunch and dinner). Across the selected sample, most studies addressed FLW at the operational level (24), followed by food type (10), sectoral (9), and meal level (4) (Table 3). FLW was reported both in food production processes within hospitality restaurant kitchens as well as food service, with some studies extending to supply chain stages.

Operational FLW

Operational FLW in the hotel and catering industry occurs at various points in the supply chain, but not all stages are analysed equally. In particular, the transport stage is overlooked in the reviewed literature, representing a clear research gap (Jia et al., 2024; Schulze et al., 2022). At the reception stage, supplies are either moved directly to preparation or placed in storage. In medium- and large-scale hospitality operations, storage occurs under cold (perishables) or dry (non-perishables) conditions. Thus, in view of FLW during storage, the study yielded the lowest amounts (30.1 Kgs/day) on storage wastes as compared to 166.7 Kgs/ day generated during food preparation (Omari et al., 2023), while Jayasekara et. al. (2024) found the rates of FWL to be in the order; spoilage, preparation and over production. In addition, Tomaszewska et al. (2021) in an attempt to add their voice on the subject under investigation found out that spoilage due to expiry contributed 29% to the food discarded as a result of FLW, while Thies et al. (2021) sought to verify the FLW arising from food storage and found it was highest for the Gastronomy segment with the lowest percentage rate within the Communal Catering segment, a clear indication that FLW from the storage stage of ingredients vary depending on the hospitality business type. In contrast, preparation and service stages consistently generate the largest amounts of FLW. Zeineddine et al. (2021) found that plate waste contributed 1,620 tons annually, while the number of dinners per table are prone to decrease FLW signifying the importance of attracting group than single diners. Further, Tomaszewska et al. (2021) gave a different analysis based on the type of service, with results showing 0.046 kg of plate wastes from each serving offered to guests which included buffet dinner, and that excessive large portions and inadequate taste of food were singled out as the main reasons for generating plate waste. In summary, FLW in the hospitality industry tends to focus on preparation and service rather than storage. Targeted measures such as portion control, improved menu design, improved forecasting, and consumer awareness strategies are needed to counteract these losses. These measures not only support food safety, but also strengthen the economic sustainability of the catering industry.

Sector wise FLW categorization

FLW is experienced in all hospitality's food and beverage sectors, with a higher rate recorded in all-inclusive than traditional hotels as established by Elnasr et al. (2021). Conversely, restaurants produce comparatively less waste than hotels and caterers (Afzal et al., 2022). Within the restaurants sector, there are differences depending on the market segment. High-end and low-end restaurants report higher FLW than mid-range establishments. For high-end restaurants, extensive menus contribute to overproduction, while in low-end restaurants, poor food quality and unappealing dishes cause plate waste (Chalak et al., 2021; Tomaszewska et al., 2021). Further, menu style within the various hospitality's food service sector also matters. Extensive table d'hôte menu served mainly in the all-inclusive hotels as well as low-end restaurants often result in greater waste production compared to the a' la carte menu, which happens to be typical of upscale

restaurants, where quality control and pricing incentivize efficiency is the main focus (Kattiyapornpong et al., 2023). Ownership and management structure also play a role. Local independent restaurants tend to generate more FLW than chain-affiliated restaurants (Zeineddine et al., 2021). However, chain affiliated restaurants are more likely to monitor waste systematically, while independent restaurants often lack measurement practices (Filimonau & Uddin, 2021). Albeit these studies were in different countries, one in Lebanon and the other in the UK. Still, the same pattern can be traced across the world, which equally applies to self-run as compared to outsourced canteens (Zhang et. al., 2024). Whereas many of the chain restaurants can be traced back to the developed world and further focuses more on profitability, self-run restaurants may be locally owned but similarly focus more on profitability as well. Thus, they all tend to institute more stringent measures of mitigating FLW so as to achieve not only the set targets in terms of profitability but also the UN agenda of 2030 of reducing hunger by halving FLW (UNEP, 2024). However, from the available data, local independent restaurants were found to generate more FLW. The figures could even be higher since many of these facilities are not bothered with establishing the amounts of FLW.

FLW based on food type

Hospitality operations handle a wide variety of food types, and waste levels differ significantly across categories. Different food types are prone to yield different amounts of FLW as indicated in various studies on the topic. Vegetables consistently emerge as the largest contributor. For example Sehnem et al. (2022) reported that vegetables accounted for 59% of monthly waste in Brazilian restaurants followed by carbohydrates (21%), meat and bones (16%) and desserts and drinks (4%) while Sucheran & Olanrewaju (2021) established that FLW was in the order; drinks (41%), salads (29%), vegetables (27%), meat (18%), bread (12%) and condiments (6%) respectively. While Filimonau et al. (2023) study failed to quantify FLW based on food type, the results show that bread, vegetables and rice yielded the most FW while meat and fish gave the least. Further, Rizzo et. al. (2023) study established that 23% of FLW could be accounted by meats as this study focused on investigating FLW with an interest on meats. This is suggestive of the varying levels of FLW experienced within hospitality operations based on the type of food in relation to the food classes. From this analysis of findings therefore, different food types are known to yield varied contributions towards FLW, with vegetables (and salads) contributing more, followed by carbohydrates (rice, pastries and bakery e.g., bread) and meats (beef and products, chicken and products, fish etc.) as more patrons consume meats more than carbohydrates, fruits and vegetables. Even though vegetables and fruits are considered healthy foods especially as a therapy for lifestyle related illnesses according to health scientists, many people across the world frown on these food types in comparison to the meats (Mohammadi et al., 2023). As a result, there is more FLW from these food groups since they have a very low reception and therefore consumption rate not only among hospitality clients but even at household level. However, numerous factors beyond the scope of this study play an important role in food loss and waste (FLW), particularly those that influence customers' selection of menu items in the hospitality industry, where the potential for high FLW is significant. Interventions should therefore focus on more accurate portioning and better menu planning for vegetables and carbohydrate-rich side dishes, while ensuring continuous monitoring of meat and protein waste.

FLW based on the type of the meal

FLW patterns also vary according to the type and timing of meals. Juvan et al. (2021) established that dinner buffets generate more FLW than breakfast buffets, although they did not investigate and therefore generated data for purposes of comparison with lunch buffets. This trend may be attributed to the fact that breakfast being the very first meal in anyone’s day and therefore serves as the first meal to restaurant patrons attracting a higher consumption rate, whereas any meals coming after breakfast, especially when restaurant clients have had some other meals in between is prone to be partially consumed thus yielding higher FLW. According to Okumus et al. (2020), much FLW is prone to be generated during dinner as a result of all-day food and drink service and therefore guests may not be hungry. Banquet settings, where multiple meals follow tea breaks, can further increase waste. Moreover, the study results indicate that buffets contribute more FLW during breakfast and dinner (Tomaszewska et al., 2021) while Zhang et al. (2024) found that lunch contributes the highest FLW out of the three meals, even though none of the selected articles delved in to investigating the contribution from the other alternative food and beverage service methodologies. Thus, while Ally et al. (2024) established that the daily FLW estimates differ between the time of the meal services, Filimonau et al. (2021) on the other hand found that FLW differ depending on the days of the week, with Fridays to Sundays (weekends) contributing the highest (60%), while Mondays to Thursdays (weekdays) contributing the least (40%) FLW. However, according to Filimonau et al. (2023), FLW estimates from the food service sector are seldomly clear. This is because the industry is highly segmented, with many operators both public and private in nature. Additionally, the hospitality industry is wide-ranging

with many industry players. In summary, more studies should be carried out on the subject under investigation in order to establish, more precisely, the rate of FLW registered during lunch, dinner and breakfast with much more meticulousness to enable a comparison across the different hospitality operations. Thematic analysis findings are synthesized by author, year, country, main results, and FLW classification in the following table.

Table 3: Results of thematic analysis of the selected articles

AUTHOR (S)	COUNTRY	FINDINGS	FLW TYPE
Thies et al. (2021)	Germany	Annual meat waste of 85,800 tons mostly from Communal Catering (26,500 t; 31%), Gastronomy (23,000 t; 26.8%), Hospitality and Food Service (22,800 t; 26.5%), and Accommodation (13.500 t; 15.7%).	Food type
Sucheran & Olanrewaju (2021)	S. Africa	FW mostly refers to drinks (41%), salads (29%), vegetables (27%), meat (18%), bread (12%), and condiments (6%). Points of FW include preparation (37%), guest plate (32%), production (21%), and purchasing (10%).	Food type
Tomaszewska et al. (2021)	Poland	Buffet, dining room or plate (on average 72.55%). An average of 0.046 kg plate waste. Highest FW was recorded during the week (plate waste) from breakfast buffet (average 39.41 kg/week). Plate waste averaged 11.69 kg, and 16.29 kg for groups.	Meal
Juvan et al. (2021)	Slovenia	Dinner buffets are worse than breakfast; latest breakfast serving time is worse than the earliest; high-end breakfast buffets are worse than budget. The first meal and presence of children also lead to more plate waste.	Meal Operational
Elnasr et al. (2021)	Egypt	FWL at the all-inclusive was higher than traditional hotels. Kitchen operation should not significantly impact. 25–35% of food was wasted during a single meal. FLW depends on seasonality, background of guests, staff skills, and awareness.	Meal
Zeineddine et al. (2021)	Lebanon	1,620 tons of plate FW are generated per year in Beirut, (0.15%) of Lebanon's. Lebanese cuisine restaurants generated 34 kg of organic waste per day more than restaurants that serve international non-Lebanese cuisine.	Operational
Liang et al. (2021)	China	Restaurant FW: ‘‘Ordering too much (39.5%)” and ‘‘Food is not tasty (32.7%)”. Business parties contributes (41.2%) to FW, wedding banquets and bereavement events (40.4%).	Operational Sectoral
Lins et al. (2021)		About 2.9 T dollars lost. Reasons identified: cost of wasted raw material, use of cleaning material, the energy consumption, salary of food handlers, the water footprint, the amounts of rest-intake, production waste, energy density wasted, use of organic food, and food donation.	Operational Sectoral
Baul et al. (2021)	Bangladesh	935 kg of biodegradable and non-biodegradable waste per month from each restaurant, and total waste generation was 3210 kg/day. Contribution of fresh food waste, food residues, papers waste was 45, 37, and 10%, respectively.	Operational
Filimonau & Sulyok (2021)	Hungary	FW is seen as an indirect operational expense. Only one manager was able to quantify FW. Majority said it was small-medium, a few said is "negligible".	Operational
Chalak et al. (2021)	Lebanon	Diners in both low and high price range restaurants waste above the grand mean compared to middle-range ones. Waste generation decreased significantly as the number of diners per table increased.	Operational
Filimonau et al. (2021)	UK	FW in foodservice (14748 Kgs/ Year - 16-31%, Friday-Sunday accounts for 60%). FW =rice, noodles, vegetables, and meat. Most FW generated during preparation and plate leftovers.	Operational
Antonschmidt & Lund-Durlacher (2021)	Austria	Average amount of edible plate waste per guest was lower during the test (-14.39%). Mean amount of edible plate waste in the control group was 18.39 g and in the treatment group 15.74 g per guest.	Operational
Çirişoğlu & Akoğlu (2021)	Turkey	79.3% FW is produced in the service department of restaurants. 68.9% was vegetables. Customer expectations (31.1%) and personnel carelessness (21%) were the main causes of FW.	Operational
Filimonau & Ermolaev (2021)	Russia	Average restaurant produces 14 t of FW per year, annual sectoral; 1.23 Mt. Fine dining restaurants wasted (17.5 t per year) while the smallest annual wastage was recorded for QSRs (9 t).	Sectoral
Filimonau & Uddin (2021)	UK	Chain-affiliated businesses routinely measure FW. Independent restaurants (ethnic cuisine) take no measurements of FW and manage it on an ad-hoc basis.	Sectoral
Sehnem et al. (2022)	Brazil	Vegetables (59%), carbohydrates (21%), and meat/bones (16%) were the main FLW; desserts/drinks 4%. Average waste: 339 kg/month per restaurant (~13 kg/day), cost of ~R$2,578/month.	Food type
Tomaszewska et al. (2022)	Poland	Excessively large portions and inadequate taste of dishes were indicated by almost 50% of respondents as the main reasons for the generation of plate waste.	Operational
Bilska et al. (2022)	Poland	Most of the items thrown away were perishable foods that were often still usable (e.g., withered products, opened but un spoilt products).	Operational Food type
Afzal et al. (2022)	Pakistan	Waste per customer was 79.9 g (survey) and 73.4 g (live tracking) for restaurants, 138.4 g for hotels, and 140.0 g for caterers. Similarly, the percentage of waste per day was 15% (survey) and 17% (live tracking) for restaurants. Plate leftovers were reported to be the primary source of FW, followed by inaccurate customer forecasting.	Operational
Malefors et al. (2022)	Sweden	Median FW levels of 42 & 66 g. 15–30% reduction was observed. Approximately 19,000–21,000 tons of FW are generated annually in Swedish preschools and schools.	Sectoral
Goossens et al. (2022)	Germany	Disposing of the leftovers as food waste costs the hotel kitchens 0.05 EUR per kilogram.	Sectoral Food type
Rizzo et al. (2023)	Portugal/ Brazil	Meat was found to contribute 5% of the total food waste, which is over 20%, and equivalent to US$122.00 per capita/year. Almost US$750 billion in food is thrown away each year worldwide (cost ingredients).	Food type
Filimonau et al. (2023)	Iraq	FW per meal is 38g. Bread, vegetables, and rice represent the most wasted while meat and fish is minimal. This highlights the need for routine empirical validation of figures derived for the national foodservice sectors of developed, but particularly developing countries.	Food type
Omari et al. (2023)	Morocco	The average daily food waste (FW) was 320.3 kg, of which 166.7 kg was due to food preparation and only 30.1 kg to storage. Vegetables (50.8 kg), fruit (47.1 kg), sauces (39.9 kg), and cereals (38.4 kg) were wasted the most, while eggs (10.2 kg) and dairy products (11.7 kg) were wasted the least.	Operational
Sobaih (2023)	Saudi Arabia	Food waste costs the world USD 750 billion directly and the kingdom USD 11 billion annually.	Operational
Ssepuuya et al. (2023)	Uganda	FW estimated to range between 312 and 380 kt by 2019. With a solid waste collection coverage of 45%, households, institutions and markets in Kampala can respectively supply 680, 80, and 8 t of food waste daily.	Operational
Tang et al. (2023)	China	FW of 96,303 in restaurants, and 3,106 t per day from the catering industry. A main part of raw materials (86.7%) is delivered to be served after cuisine, and the rest (13.3%) abandoned as leftover. The served part is mainly consumed (53.8%), and the rest are wasted.	Sectoral
Bathmanathan et al. (2023)	Malaysia	339.5 kg of FW was collected in 38 days and was transformed into 131.5 kg of bio-fertilizers for sale to parents in the same school. The school generated RM 1315 from the sale of the bio-fertilizers.	Sectoral
Ally et al. (2024)	Tanzania	On average, the daily FW was estimated to be 137.5 kg and 1.81 kg/guest/day. The generation rate differs between the time of meal services (breakfast, lunch, and dinner) and whether the service was à la carte or buffet. Food wastage was increased at breakfast and dinner.	Meal
Lévesque et al. (2024)	Canada	131 g of FW per consumer. Plate waste is significantly lower ($p = 0.004$) than global kitchen waste. FW per consumer is 1.44 CAD. The costs associated with preparation waste are also significantly higher than for the other types of FW.	Operational
O’Neill et al. (2024)	USA	Cost reduction was found to be the primary motivation to reduce food waste among most participants; however, most back-of-house restaurant managers were highly motivated by an appreciation for and involvement with the food itself.	Operational
Jayasekara et al. (2024)	Australia	FW included spoilage, preparation, and overproduction. Using cumulative figures, FO-A produced 79 kg FW and 146 kg of inedible FW, FO-B produced 34 kg of edible FW and 209 kg of inedible. Average daily FW was 25 kg. This equated to approximately 5.5–6.1 kg of pre-consumer waste per full-time-equivalent employee per day.	Operational
Nathalia et al. (2024)	Indonesia	Not all have separated and weighed food waste from their restaurants. Two main problems were their guests and their staffs	Operational

Sobaih & Elnasr (2024)	Saudi Arabia	FW was 20% of served food. 43% of guests waste 20 and 30% of the portion size. Cucumbers and tomatoes also revealed some waste 57% and 63% of customers, discarding. Lettuce (80%) of restaurant managers reporting 31–40% of serviced portions going uneaten by customers.	Operational Food type
Orr & Goossens (2024)		FW was reduced by 46% in two canteens over the time period of six months. This preserved 343 kg of food waste, yielding net economic savings of over 15,500 Euros,	Sectoral
Zhang et al. (2024)	China	FW of 158.4 g; lunch (78.8 g). Vegetables were the largest contributors, livestock products, though comprising only 29.9%. Self-run canteens generated less waste across all meals compared to outsourced, and higher food and cuisine diversity increased FW.	Sectoral
Camilleri (2025)	UK	Appraises the Global Reporting Initiative (GRI), Sustainability Accounting Standards Board (SASB) and FLW Accounting and Reporting Standard (FLW Standard). This contribution identifies profitable, yet eco-friendly restaurant behaviours.	Operational
Chaerul et al. (2025)	Indonesia	FW 0.74 kg/consumer/day, with the largest proportion being FW (55.74%) and the composition of food waste dominated by waste containing carbohydrates (32.15%). Restaurants using the buffet serving approach generated 0.87 kg/person/day.	Operational Food type
Sigala et al. (2025)	Greece	FW was 76.2–121.0 g/meal for the hotels, 99.4 g/meal for the business caterer, and 151.9 g/meal for restaurant.	Sectoral

Conclusion

This study provides several theoretical contributions to research on FLW in the hospitality industry. It presents the state of global publications and shows a concentration in developed countries and an uneven coverage of the various sectors of the hospitality industry. Further, this study was able to establish the main dimensions of FLW, which were categorized into four main groups of food losses generated within the global hospitality industry thus enhancing the already published information on the study topic. It found that FLW consist more from vegetables, fruits and other carbohydrates than from meat or fish. Finding further suggest that, in general, hotels compared to restaurants, and buffets compared to a' la cart, generate more FLW. Regarding restaurants, local and independent restaurants record higher FLW than chain restaurants. Based on this revelation, this study's results serve as a wake-up call to researchers as well as practitioners within the hospitality industry to focus on the specific key areas which presents gaps that warrants action, and therefore provide mitigation against FLW and therefore be able to achieve the 2030 SDG agenda. Finally, this study adopted a systematic review approach which provides a pool of resources and knowledge, that serves as a foundation for scholars as well as policy makers to extend the scope of their investigation on FLW. By extrapolation, further studies and publications may be carried out in line with the subject matter. Thus, this study has identified important information on the status of research and publication and statistical outputs, research gaps and proposed areas of consideration for further investigation in the field of food service management. With little time left to achieve the 2030 target of halving the FLW, it provides timely insights that are of immediate relevance to industry practice. This study therefore generated a host of knowledge on FLW within the hospitality industry which is key for policy and practice.

By establishing the main sources of FLW in the hospitality industry, the results can assist industry practitioners to frequently monitor and therefore strategically institute control measures in order to minimize FLW. Thus, industry players and practitioners a like should carefully monitor and minimize FLW along the hospitality food supply chain, that is, from purchasing, transportation, receiving, storage, but most importantly preparation and/or cooking, holding for service and service of the food to clients. Based on this study's findings, managers of all-inclusive hotels that have expansive buffets and managers of local independent restaurants that have independent supply chain should be extremely careful in planning and delivering its service. It is also important for the kitchen brigade to consider not only preparation, but also service of smaller portions of vegetables (and salads) and carbohydrates as compared to meats in order to ensure minimal FLW within hospitality operations. Smaller portions could be applied for all a' la carte meals because current trends suggest guest do not want to overeat (Ally et al., 2024).

This study was restrictive to the broader hospitality food service sector and therefore only addressing FLW among the food service sector, while overlooking the household as well as retail sectors. It should be noted that in order to achieve a breakthrough in the consequences and therefore minimize the effects of FLW, there must be a deliberate effort to address this problem at all levels with equivalent magnitude. Besides, the study was a systemic literature review and so relied on secondary data from the selected journal articles. Although the records were retrieved from WoS and Scopus for the period 2021–2025, this cannot guarantee the completeness or quality of the included publications, and some relevant studies may have been excluded. Based on the limitations of the study highlighted above, further studies could examine publications in other databases and different time spans to compare the findings. Further research should also examine FLW in specific segments of the hospitality industry, distinguishing between commercial and non-commercial operators, independent and chain restaurants, and casual and upscale restaurants. Comparative analyses across countries and continents are particularly important in order to obtain more up-to-date and geographically representative data on global FLW. Country-specific studies would also help to validate statistical estimates and ensure timely updates. Furthermore, this study builds on Ameen et al. (2023) suggesting that academics should investigate how new technologies can help with waste reduction. Thus, updated data on FLW will ensure clear and informed research, focus and efforts towards monitoring and managing FLW within the hospitality industry. This would assist to establish an accurate

and up-to-date information on the current contribution of FLW from the hospitality industry across the World, and therefore institute viable mitigation strategies at national and international levels.

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