

MANAGING FOOD WASTE IN HOTELS; CHALLENGES AND OPPORTUNITIES

MANZOOR NABI NAIKOO¹, RAMEEZ AHMAD MIR², SHABIR AHMAD DAR³ AND ASHAQ HUSSAIN NAJAR⁴

^{1,3} *Lovely Professional University Jalandar Punjab, India*

² *Chandigarh University, Chandigarh, India*

⁴ *Tourism, Central University of Kashmir, J &K, India*

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ABSTRACT

With rapid urbanization, India is facing massive waste management challenges. The huge mass of waste not only degrades the environmental integrity but also results in rise of numerous health hazards. The central focus of the paper is to study the challenges and opportunities associated with Food Waste Management (FWM). This study evaluates the multi-dimensional concept of FWM by scrutinizing 33 nominated publications following the guiding principles of content analysis. The results were characterized into four extensive important themes: (1) Food Waste Sources & Causes; (2) Food Waste in Hotels and restaurants; (3) Implications of Food Waste; and (4) Measures and Actions towards Food Waste Prevention. The novelty of the study lies in its effort to conceptualize a complete framework of FWM as the present literature inclines to be empirically tilted, ensuing in theoretical frameworks under used or useful in a fragmented way.

KEY WORDS : Food waste, Environment, Management, Hotel, Practices and actions.

INTRODUCTION

The global occurrence of FW not only posed a threat to the environment, society and communities but also lead to wastage of money and resources (Gustavsson *et al.*, 2011). The speculated increase in climate change seems to be caused by the increased emission of greenhouse gases from FW (Pielke Sr *et al.*, 2007). One of the contributors of carbon emission are the FW produced from hotels. Therefore the hotel management requires a focused attention towards the green initiatives (Griffith *et al.*, 2017; Remolador, 2011). Though, the hoteliers do not agree that the problem lies in their own areas, with this result neither hotels are incentivized to operate differently nor the hotels follow good sustainable practices (WRAP, 2013) viz a viz food production and service is considered. In addition to environmental paybacks, mostly in developing countries, resolving the issue of FW helps in

addressing the problems of food availability and self-sufficiency.

METHODOLOGY

The prevailing literature regarding FW was reviewed and analyzed in an organized way. The articles were picked up from the literature on the basis of certain criteria. At First, the title of the paper from literature must include the following terms: food waste management, food waste in hotels, restaurants, disposal or treatment. Second, the framework of the articles must be within the scope of the Hotel Industry. Third, published literature was given the preference over other sources in order to maintain the quality and reliability of the content. With the result, 29 journal articles, one book chapter, one thesis chapter, one conference paper and two official websites over the concern issue as given in Table 1.

(^{1,2,3} Research Scholar, ⁴ Assistant Professor)

Corresponding author's email: ashaq.najar@cukashmir.ac.in

OrcId:0000-0003-3101-4854

The current study adopted the secondary source data, already published articles, the outcome of the study based on these sources was achieved by applying the content analysis. It is a method which gives an opportunity to understand the relation between the texts, images and audios by applying open coding and counting the themes that are achieved during analysis (Krippendorff, 2018). The Inductive analysis was applied to analyze all the available literature into different themes and categories based on the interpretivism epistemology and the ontology of realism is put into practice in order to understand the reality of the concept (Berg, 2004). The available source of articles were scrutinized on the basis of commonality between the published articles, which were selected based on the selected words related to FMW. The final outcome of the study out of extensive literature scanning is presented into main broad four themes, with the development of conceptual framework supported by the different theories of the field.

FINDINGS AND DISCUSSION

Theme-1: Food Waste Sources and Causes

Ofei and Mikkelsen (2011) stated that incorrect storage, left over's from preparation such as in adequate food handling and preparing more than ordered, unnecessary portions and plate leftovers, wrong forecasting, spoiled and forgotten food, the environmental and economic costs of FW. (Fig. 1).

The motivation towards environmentally friendly mechanism for storing food is simply encompass behavioral changes, leads to direct and positive impact (Figure 2). Though encouraging environmental friendly activities is imperious for reducing FW.

Theme-2: Food Waste from Hotel Industry

FW was defined as an edible food left unconsumed because of incorrect industrial conduct, deficiency of

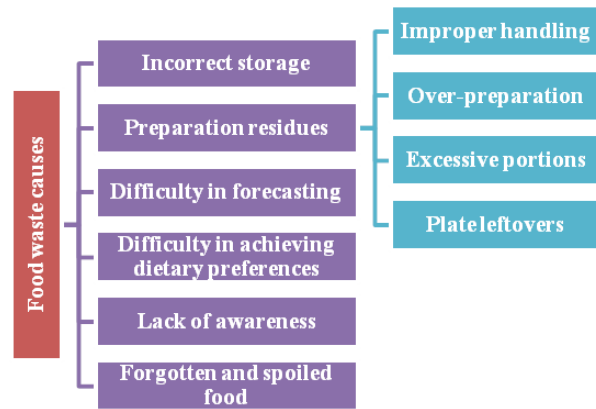


Fig. 1. Source: (Ofei & Mikkelsen, 2011)

researchers highlighted the term 'FW' as 'unsustainability hot spot' (Eriksson *et al.*, 2018). Assessments revealing that FW creates an economic

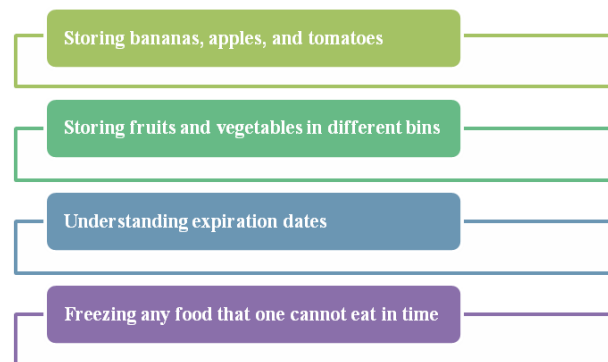


Fig. 2. Source: (EPA, 2016a).

distribution, or customer misuse (Okumus, 2020). FW arises at any stage all through the food supply chain (Mena *et al.*, 2014). FW exists everywhere across the food production chain in hotels right from purchasing to post consumption (Fig. 3).

Theme-3: Implications of Food Waste

Waste from food has severe consequences in terms of sustainability and environmental issues, so the

Table 1. Stage Definition

Storage	Food left inconsumable after spoilage, contamination.
Primary processing	left after cleaning, classification and packaging.
Secondary processing	left behind during cooking, trimming and extrusion.
Product evaluation	due to quality control and standard recipes.
Packaging	Food waste due to improper packaging.
Marketing and Distribution	Damaged food from transportation and distribution
Consumer	due to poor storage/stock management

Source: (Alexander *et al.*, 2017; Mena, Terry, Williams and Ellram, 2014; Okumus, 2020)

Table 2. List of selected articles

No.	Author	Year	Title	Publication
1	Leverenz, Hafner, Moussawel,	2021	Reducing Food Waste in hotel kitchens based on self-reported data	Journal Article
2	Kranert, Goossens, and Schmidt	2021	"Food Waste Generation in Germany in the Scope of European Legal Requirements for Monitoring and Reporting"	Do
3	Okumus	2020	"How do hotels manage Food Waste? evidence from hotels in Orlando, Florida"	Do
4	Kainthola, Kalamdhad and Goud	2020	"Optimization of process parameters for accelerated methane yield from anaerobic co-digestion of rice straw and Food Waste"	Do
5	Letcher and Vallero	2019	Municipal Landfill	Do
6	D. Vallero and G. Blight.	2019	A Handbook for Management	Book Pub
7	Najar, A. H. and Hamid Rather, A.	2020	"Mediating role of guest's attitude toward the impact of UGC benefits on purchase intention of restaurants	Journal Article
8	Hennchen	2019	"Knowing the kitchen: Applying practice theory to issues of FW in the food service sector"	Do
9	Papargyropoulou, Padfield and Ujang	2019	"Patterns and causes of Food Waste in the hospitality and food service sector: Food Waste prevention insights from Malaysia"	Do
10	Wang, Xue, Li, Liu, Cheng and Liu	2018	"Horeca Food Waste and its ecological footprint in Lhasa, Tibet, China. Resources, Conservation and Recycling"	Do
11	Eriksson, Osowski, Eriksson and Ghosh	2018	"The tree structure—A general framework for Food Waste quantification in food services."	Do
12	Sakaguchi, Pak and Potts	2018	"Tackling the issue of food waste in restaurants: Options for measurement method, reduction and behavioral change"	Do
13	Monzon Santos	2017	"Food Waste Management -Perceptions, Decisions, and Actions: The case of Guatemala City Department Restaurants."	Thesis
14	Food and Agriculture Organisation	2017	FAO Regional Office for Latin America and the Caribbean	Website
15	Wang, Liu, Liu, Liu, Gao, Zhou, Gao and Cheng.	2017	"The weight of unfinished plate"-"A survey based characterization of restaurant Food Waste in Chinese cities"	Journal Article
16	Alexander, Brown, Arneth, and Rounsevell	2017	"Losses, inefficiencies and waste in the global food system"	Do
17	Griffith, Jackson and Lues	2017	"The food safety culture in a large South African food service complex: Perspectives on a case study"	Do
18	Pirani and Arafat	2016	"Reduction of Food Waste generation in the hospitality industry"	Do
19	Heikkilä, Reinikainen, and and Hartikainen	2016	"Elements affecting Food Waste in the food service sector"	Do
20	Food and Agriculture Organisation	2015	"The state of food insecurity in the world 2015"	Website
21	Evans and Welch	2015	"Food waste transitions: Consumption, retail and collaboration towards a sustainable food system"	Do
22	Mena, Terry, Williams, and Ellram	2014	"Causes of waste across multi-tier supply networks: Cases in the UK food sector"	Do

Table 2. *Continued ...*

No.	Author	Year	Title	Publication
23	Tuppen	2014	"Reducing and Managing FW in Hotels. Green Hotelier."	Do
24	Lipinski, Hanson, Lomax, and Kitinoja	2013	"Reducing food loss and waste"	Do
25	Water and Resource Action Programme	2013	"Overview of waste in the hospitality and food service sector"	Website
26	Kallbekken & Saelen	2013	"Nudging hotel guests to reduce Food Waste as a win-win environmental measure"	Do
27	Gunders	2012	"Wasted: How America is losing up to 40% of its food from farm to fork to landfill"	Do
28	"GustavssonVan Otterdijk & Meybeck"	2011	Global food losses and Food Waste	Do
29	Ofei & Mikkelsen	2011	Food Waste food service	Do

Source: (Alexander *et al.*, 2017; Berg, 2004; Betz *et al.*, 2015; Eriksson *et al.*, 2018; Evans and Welch, 2015; FAO, 2015, 2017; Freedman and Brochado, 2010; Griffith *et al.*, 2017; Gunders, 2012; Gustavsson *et al.*, 2011; Heikkilä, *et al.*, 2016; Hennchen, 2019; Kainthola *et al.*, 2020; Kallbekken and Saelen, 2013; Krippendorff, 2018; Leverenz, Hafner, *et al.*, 2021; Leverenz, Schneider, *et al.*, 2021; Lipinski *et al.*, 2013; Mena *et al.*, 2014; Monzon Santos, 2017; Ofei and Mikkelsen, 2011; Okumus, 2020; Papargyropoulou *et al.*, 2019; Pielke Sr *et al.*, 2007; Pirani and Arafat, 2014, 2016, 2016; Remolador, 2011; Sakaguchi, *et al.*, 2018; Scialabba, 2011; Tuppen, 2014; L.E. Wang *et al.*, 2017; WRAP, 2013)

loss of 23 percent of food purchased (Papargyropoulou *et al.*, 2019). Likewise, the environmental impact of in China was observed to be approximately twice the size of its arable land (Wang *et al.*, 2018).

Theme -4: Measures and Actions towards FW Prevention: Whatsoever the causes and sources for FW, the objective of different stakeholders and their behavioral intention among which the hotel industry and restaurants Singh and Najar, (2020) specifically are involved, was to escape and stop this from happening (Tuppen, 2014). Amid the strategies and actions that might have already been in

existence to minimize FW in hotels are: Increasing awareness in the employees through gratifying specific actions, and concentration of restaurateurs on FW amounts and their origins. Some more strategies include: menu engineering, reduction of plate size, activity-based costing, donation of food leftovers, FW tracking, customers fining, delivery checking to verify for contaminants, bio-treatment alternatives such as anaerobic digestion and composting, damaged packaging, expiry date; FIFO approach in inventory, locally sourcing products, avoidance of over trimming during preparation, storage practices to allow air to reach fruits and vegetables, and minimization of starter's portions

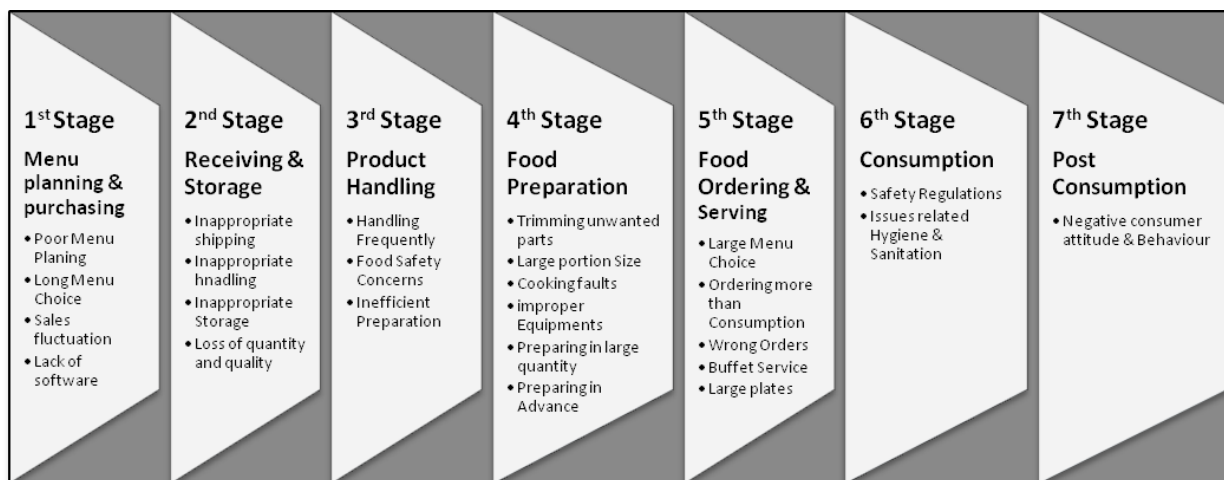


Fig. 3. *Source:* (Freedman & Brochado, 2010; Lipinski *et al.*, 2013; Pirani & Arafat, 2016)

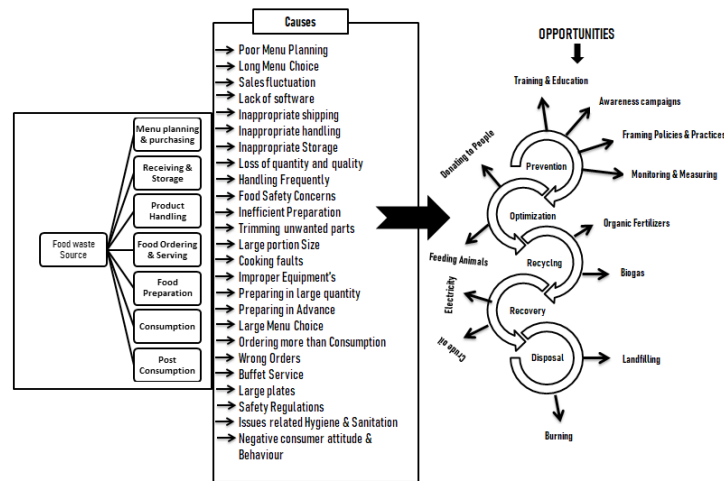


Fig. 4. Conceptual framework of Food Waste Management

(Pirani and Arafat, 2014). Activities planned to identify, manage and reduce food waste in hotel industry are the actions like selection of a FW carrier, conduction of FW audit, application of FW management programs based on FW hierarchy, employment of green purchasing, training of employees and inspiring their involvement and reactions of the program, and the customer involvement in the program.

The Fig 4, depicts the sources, causes and opportunities viz a viz food wastage based on the literature discussed above and the interaction with the industry stakeholders like hotel managers, The theory Social Cognitive Theory is proposed to examine the relationship between all these components of this model in the field of hospitality and tourism because the responsible human behavior is caused by personal, behavioral, and environmental influences, the opportunities of FWM can help in environment sustainability.

CONCLUSION

This paper scanned the literature on Food Waste mechanism and management in hotels. The study tries to develop a broad framework of challenges and opportunities for food wastage in hotels, as there is a scarcity of understanding of theory of FW and sustainability. More understanding and clarity about FW is possible with the current study by scanning major concepts and trends of research regarding FW in hotels. The categorization of the different challenges and opportunities is presented. Based on the findings, a conceptual framework is proposed for further investigation. Drawing on the

existing literature, different concepts related to FW were discussed. The influence of food waste on sustainability is suggested to be examined using the Social Cognitive Theory. In case, the hotel business operators do face some issues in reducing the food wastage, mainly due to the perception and eating style of the guests. So, they need to take specific initiatives in order to aware of their customers regarding the prevailing situation of food wastage, and they also need to encourage them to be more concerned about sustainability while satisfying their food requirements. Also it is better to donate the leftover food after cutting as much as possible. The current study has limitation of incorporating only 29 articles which can be enhanced up to 100s and also the quantitative examination can be conducted.

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