

**MINIMISING FOOD WASTE AND ITS IMPACT ON SUSTAINABLE BUSINESS PRACTICES: A
STUDY OF HOTELS IN EASTERN INDIA**

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ABSTRACT:

In recent years, wastage of food has assumed a massive problem in most areas that involve the provision of food such as the hospitality firms. This paper aims at finding out how the concept of food waste management can improve the sustainability of business ventures in the hotel industry with reference to Eastern India. The research adopts both qualitative and quantitative research techniques as it employs surveys with managers and chefs in sample hotels, interviews; as well as waste audit data, and financial information. These findings show that if food waste products are minimized, then environmental sustainability, operational efficacy, and profitability of the hotels too gains strength. There are however some of the tactful interventions that have been mentioned they include; portion control, staff training and food donation program. Customer behaviour is also identified as another factor that contributes to food waste and states that informing guests about portions may eliminate additional waste. The study gives recommendations on ways that the hospitality sector can incorporate environmental conservation into its operations to the advantage of the hotels. Consequently, one can deepen the implementation of the food waste management as a part of sustainability plans to enhance firms' performance and companies' image. It is better for the hotels to focus on these areas in order to enhance their capacity to become sustainable accommodations to reduce negative impact to the environment. Reducing food waste through the following is likely to result in cost reduction, better operational efficiency and satisfaction of consumer needs.

Keywords: Food waste, Sustainable business practices, Hospitality industry, Hotels, Eastern India

INTRODUCTION:

Food waste is a growing global issue, particularly within the hospitality industry. According to the Food and Agriculture Organization, at present global food waste is estimated to be 1.3 billion tons per annum and continues to grow (FAO 2021). Some of some of the main offenders in this regards are the hospitality industry embrace hotels, restaurants and other food related industries. In a hotel context, food waste has been identified mainly from overproduction, food wastage, and excess food leftover from the food buffs and other occasions apart from contributing the hotel industry financially, it has greatly contributed to the pollution of the environment by emitting carbon and overusing some resources like water and energy. Some of the measures that can curb on food wastage include; Controlling portion size, Serving food based on the traffic-hum pattern and food donation. In order to reduce food waste hotels and restaurants should spread awareness about the problem among their staff and their guests. In India, the issue of food wastage is closely related, even more, so in the eastern region which consists of important tourist destinations such as Kolkata, Bhubaneswar, and Patna. Currently, hotels in these regions are always under pressure to meet the high demand of tourists, at the same time ensuring that food wastage is kept to the bare minimum. Most of the wastage comes from preparing large portions of food to cater for the unknown number of guests, which through improper stock control, ends up being wasted, leftover dishes from the regularly conducted buffet services are also a major cause of wastage. More recently, work by Betz et al. (2015) highlighted that overproduction was major causes of food wastage, and that better portions control and inventory management can contribute to reducing this wastage. Papargyropoulou et al. (2016) also pointed out that portion control done in most hotels through buffet leads to a tradition of leftovers because guests tend to estimate the amount a customer would consume. Since food wastage is set to rise the future business practice of the hospitality industry should be sustainable. Techniques that adopt sustainability also help save costs incurred on materials hence resulting to improvement in the financial returns a firm is able to post. Following an investigation into a number of hotels, Silvennoinen et al (2017) identified the fact that those have managed to successfully minimize food wastage were able to experience less negative impact on the environment in addition to experiencing financial improvements in profit margins resulting from decreased food costs. To this end, this study aims at identifying the factors that contribute to food wastage in hotels in Eastern India and the measures employed by the hotels in order to avoid the vice. Also, it also focuses on different relation with food waste that is sustainability and profit. By focusing on hotels in Eastern India, this study aims to fill a gap

in the existing literature, which has primarily concentrated on hotels in Western countries. The research combines qualitative insights from interviews with hotel managers and quantitative data from waste audits and financial records to provide comprehensive findings. The findings from this study can help hotels in Eastern India implement effective strategies to reduce food waste and improve their sustainability practices. Understanding the causes of food waste and the impact of reduction efforts can lead to cost savings and a more environmentally friendly operation for hotels in the region.

RESEARCH OBJECTIVES :

1. To identify the primary causes of food waste in hotels in Eastern India.
2. To explore the strategies implemented by hotels to minimise food waste.
3. To evaluate the impact of food waste minimisation on business sustainability and profitability.
4. To offer recommendations for improving food waste management practices in hotels.

LITERATURE REVIEW:

Reducing food waste in the hospitality industry is an area of considerable research interest, with many scholars examining sources of food waste in the sector, measures to deal with it, and the subsequent effects on sustainable development. The findings by Betz et al. (2015) revealed that over-preparing foods, spoilage and poor inventory management were cited most to be the leading causes to food waste in the hotels. They recommended that if hotels portion control and do waste assessment on a regular basis, then the levels of food waste could be reduced to as low as 20%. These findings are in line with the study conducted by Papargyropoulou et al. (2016) who pointed out that it is BUFET type of serving that adds to food wastage due to volatility of customer demand. In addition, self-defrosting Fridges and vacuum sealing were also encouraged as a solution by Papargyropoulou et al; (2016) menu engineering, and portion control to reduce food wastage in hotel food service operations. The following issues if solved can be of paramount aid in the reduction of total impacts from hotel operations to the environment as well as enhance efficiency to the hotels: Another study, Silvennoinen et al. (2017) also identifies buffet dining as when food waste occurs since large portions are prepared since customers arrive in different numbers. They advised the following as ways to curb wastage for the JCU: enhance the forecasting and portion control. In a similar vein, Kasim and Ismail examined staff training for portioning and cooking in food waste reduction in hotels, which can be lowered by 15 percent. Other measures for fighting food waste have been discussed in the literature. Derqui and Fernández (2017) pointed out that with using the menu planning approach, food donation, and inventory management, the portions of the wasted food in hotels can decrease by 30%. The European hotels, they focus on over-distribution of food surplus through donation which not only minimises waste but also adds up to their CSR activities. Pirani and Arafat (2016) expanded on this by exploring the benefits of food donation programmes, finding that they help minimise waste while simultaneously improving the hotel's reputation among guests, especially those who prioritise sustainability. Technological factors are also important when it comes to food wastage, therefore the following sub topic. According to Thiagarajah and Getty (2013), the application of technology-based control to track the production and wastage of foods managed to reduce wastage by 10%. Such systems are helpful in tracking inventory, demand and portions required and thereafter, help in minimizing wastage, a problem Hotels faced most. In another study, Buchanan et al. (2018) proved that the efficient management of food wastage leads to substantial businesses financial gains in food purchasing costs of implementing waste minimisation strategies which ranges between 10-15% and therefore increased profitability. In terms of the natural environment, minimizing portion of food waste goes a long way towards decreasing a hotel's impact on the environment. According to Devin and Richards (2018), it was evident that minimisation of wastage greatly contributes to the reduction of greenhouse gas emission and conservation of resources. Hence the cycle proves that hotels can significantly reduce their input to the adverse impacts on the environment by returning less food to the landfill and using fewer resources. In addition, following the same proposition, Beretta et al. (2019) proposed that a hotel that makes a local food offer and reduces portion sizes serves as sustainable food would have a better performance and perception of environmental fitness and thus attracts more environmental clients. Research has also been done in the area of food waste reduction in relation to the customers' satisfaction. In a survey, Parfitt et al. also identified that hotels that effort consciously to reduce food wastage gains more green customer satisfaction and loyalty. Concurring with this study, Filimonau and Gherbin (2017) have stated that reduced food waste is advantageous to hospitality businesses, as it builds a better brand image that increases room sell through and finally, the operating profit.

However, there are several barriers that still exist although the effectiveness of a reduction in food waste is obvious. Barthel and Misoczky (2015) stated that Hotels' major barriers to effective food waste management include: ignorance, Demonstrated mostly by a low level of awareness regarding food wastage among successful hotels, high costs of implementation, and inadequate staff sensitisation. Similar to Prasad et al. (2015), Legrand et al. (2018) found that most of the hotels do not have the facilities or structures, as well as the technical support required to enable proper waste management. Zhang et al. (2021) pointed to customer behaviour as a significant factor in food waste generation, especially in buffet settings, where guests often overestimate their consumption and leave large amounts of uneaten food. Szuchnicki (2018) argued that reducing food waste requires a cultural shift in the hospitality industry, with both staff and customers needing to be educated about the environmental and financial benefits of waste reduction. In India, the focus on food waste management in hotels is increasing. Rana and Paul (2017) found that growing regulatory pressure and increased consumer awareness are driving the adoption of more sustainable waste management practices in Indian hotels. However, they also noted that many hotels face challenges related to infrastructure and access to advanced waste management technologies, limiting their ability to fully implement waste reduction strategies.

RESEARCH GAP:

Although significant research has been conducted on food waste in the hospitality industry, much of it focuses on Western countries. There is limited empirical data on how food waste reduction impacts sustainability and profitability in hotels in Eastern India. This study aims to fill this gap by examining the specific strategies used by hotels in this region to reduce food waste and assessing the financial and environmental outcomes of these practices. The findings of this study will provide valuable insights for hotels in Eastern India looking to improve their waste management practices. By understanding the impact of food waste reduction on sustainability and profitability, hotels in this region can make more informed decisions about implementing effective waste reduction strategies. Ultimately, this research aims to contribute to the overall sustainability of the hospitality industry in Eastern India and beyond.

RESEARCH METHODOLOGY:

Research Design

This study employs a mixed-methods approach, combining qualitative and quantitative data to explore the relationship between food waste reduction and sustainable business practices in hotels. A descriptive research design was used to assess the causes of food waste, the strategies implemented to reduce it, and the impact of these efforts on sustainability and profitability.

Sample Size

The sample for this study includes 50 hotels located in major cities in Eastern India, such as Kolkata, Bhubaneswar, and Patna. The sample includes 5-star, 4-star, and 3-star hotels to ensure a comprehensive view of food waste practices across different types of establishments. Stratified random sampling was used to ensure adequate representation of different hotel categories.

Data Collection

Primary data were collected through structured interviews with hotel managers and chefs, focusing on food waste management strategies, challenges faced, and the perceived impact on business operations. Secondary data were gathered from hotel financial records, waste audits, and sustainability reports. Waste audit data were used to quantify the amount of food wasted, while financial records provided information on the impact of waste reduction on profitability.

Data Analysis

Quantitative data were analysed using SPSS statistical software. Descriptive statistics, chi-square tests, and regression analysis were used to assess the relationship between food waste reduction and sustainability outcomes. Descriptive statistics provided a summary of the key variables, while chi-square tests were used to examine the association between waste management practices and sustainability. Regression analysis was conducted to explore the impact of food waste reduction on hotel profitability.

RESULTS:

Descriptive Statistics:

The descriptive analysis revealed that the most significant causes of food waste in the hotels surveyed were over-preparation (reported by 45% of hotels) and leftover buffet food (55% of hotels). Spoilage due to poor

inventory management was reported by 30% of hotels, while incorrect portion sizes were identified by 20% of hotels. These findings indicate that buffet-style dining and over-preparation are the primary drivers of food waste in Eastern Indian hotels.

Table 1: Descriptive Statistics for Causes of Food Waste in Hotels

| Cause of Food Waste | Percentage (%) of Hotels Reporting |
|-------------------------|------------------------------------|
| Over-preparation | 45% |
| Spoilage of ingredients | 30% |
| Leftover buffet food | 55% |
| Incorrect portion sizes | 20% |

Chi-square Test for Food Waste and Sustainability :

A chi-square test was conducted to determine whether there was a significant relationship between food waste reduction and sustainable business practices. The results indicated a significant association between food waste minimisation and improvements in sustainability metrics. This suggests that hotels that actively work to reduce food waste are also likely to have more sustainable business practices in place. By addressing the causes of food waste identified in the study, hotels can not only reduce their environmental impact but also improve their overall sustainability performance. Implementing strategies to reduce food waste can lead to cost savings, increased efficiency, and enhanced reputation for hotels. Additionally, by incorporating sustainable practices into their operations, hotels can attract environmentally-conscious consumers and contribute to a more sustainable future. Incorporating sustainable practices can also help hotels differentiate themselves in a competitive market and appeal to a growing segment of eco-conscious travellers. By demonstrating a commitment to reducing food waste and overall sustainability, hotels can align themselves with consumer values and enhance their brand image.

Table 2: Chi-Square Test Results for the Relationship Between Food Waste Reduction and Hotel Sustainability

| Chi-Square Test Results | Value |
|-------------------------|-------|
| Chi-square value | 9.456 |
| Degrees of freedom (df) | 3 |
| p-value | 0.024 |

The p-value of 0.024 suggests that there is a statistically significant relationship between food waste reduction efforts and improved sustainability practices in hotels. This indicates that hotels that focus on reducing food waste are more likely to also prioritize sustainability initiatives, which can attract environmentally conscious guests. By implementing these practices, hotels can not only appeal to a growing segment of eco-conscious travelers but also enhance their overall brand image and reputation. This correlation can lead to cost savings, as reducing food waste often involves more efficient practices that can also reduce operational expenses. Additionally, adopting sustainable initiatives can help hotels comply with regulations and demonstrate corporate social responsibility. Ultimately, hotels that prioritize sustainability and reduce food waste are not only benefiting the environment but also their bottom line. By appealing to eco-conscious travellers and enhancing their brand image, these hotels can see an increase in bookings and customer loyalty. In the long run, implementing sustainable practices can lead to both cost savings and a positive impact on the community, making it a win-win for both the hotel and the environment. Overall, sustainability in the hospitality industry is becoming increasingly important as consumers are more conscious of their environmental impact. Hotels that take proactive steps to reduce waste and energy consumption will likely see long-term success in a competitive market.

Regression Analysis:

A regression analysis was performed to explore the impact of food waste reduction on hotel profitability. The results indicated a positive relationship between the two variables. This suggests that hotels that focus on reducing food waste can potentially improve their profitability. By implementing sustainable practices, hotels can not only benefit financially but also contribute to a more eco-friendly industry. Additionally, reducing food waste can also improve a hotel's reputation among environmentally conscious consumers, leading to increased customer loyalty and positive word-of-mouth marketing. Overall, integrating sustainability into business practices can lead to both financial and environmental benefits for hotels in the long run.

Table 3: Regression Results for the Impact of Food Waste Reduction on Hotel Profitability

| Variable | Coefficient | p-value |
|----------------------|-------------|---------|
| Food waste reduction | 0.65 | 0.01 |

| | | |
|---------------------|--|--|
| Hotel profitability | | |
|---------------------|--|--|

The regression analysis showed a coefficient of 0.65, meaning that for every unit reduction in food waste, hotel profitability increases by 0.65 units. This positive relationship is statistically significant, with a p-value of 0.01, indicating that reducing food waste has a direct and measurable impact on hotel profitability. Implementing strategies to reduce food waste not only contributes to a more sustainable operation but also has a tangible effect on the financial performance of hotels. This research highlights the importance of addressing food waste as a key factor in improving overall profitability in the hospitality industry. By focusing on reducing food waste, hotels can not only improve their bottom line but also demonstrate their commitment to sustainability, which is increasingly important to consumers. This study underscores the potential financial benefits of implementing food waste reduction strategies in the hospitality sector. It is clear that by prioritizing sustainable practices, hotels can attract environmentally conscious guests and ultimately enhance their reputation in the industry. Additionally, reducing food waste can also lead to cost savings through more efficient operations and resource management.

DISCUSSION :

The findings of this study are consistent with previous research on food waste management in the hospitality industry. Over-preparation and leftover buffet food were identified as the leading causes of food waste, aligning with the work of Papargyropoulou et al. (2016) and Silvennoinen et al. (2017). These results highlight the need for better portion control, accurate forecasting of guest numbers, and improved inventory management to minimise waste. This paper also attributed positive changes in sustainability and profitability to the successful application of waste minimisation techniques which included portion control, staff training, and waste audit. The recommended management practices emphasized in this paper include sourcing a variety of foods that have diverse uses, negotiating contracts with suppliers, and identifying new suppliers to convince with the best offers while rejecting the least attractive price offers. Hotels that implemented these practices noted that they incurred 10-15% less on food purchases, similar to the estimates of Buchanan et al. (2018). These results therefore prove that food waste reduction is not only the right thing to do in this regard but also a wise thing to do from a business perspective. From the environmental point of view, the measures that would reduce excess food shedding or the amount of foods that had been dumped as wastes to garbage dumps, have decreased the carbon footprint associated with food wastes. The author of this article seems to corroborate the work of Devin and Richards (2018), who highlighted the receptor goal benefits of the Food Waste Reduction Initiative. Hotels that specifically marketed sustainability received a positive change in brand image because many guests prefer environmentally friendly accommodations. Similarly, Filimonau and Gherbin (2017) identified that sustainability notification may increase customer loyalty and raise the occupancy rates of the hotels. However, some concerns still persist in relation to reorientation of the customers; more so, consumers in business of buffet. Some hotel managers said that their customers were usually over-estimated in their portions, thus many leftovers make their way to the trash bin. Zhang et al. (2021) pointed out the same issues, however, the authors stated that extending the portion control knowledge to customers as well as encouraging adoption of sustainable eating habits can help minimize wastage even more. Altogether, this investigation demonstrates that for a prolonged part, hotels have to continue implementing sustainable measures to combat portion control food wastage. The identified issues indicate that hotels have an opportunity to turn customer satisfaction around and improve not only the guests who are loyal to them but also the environment.

CONCLUSION :

This study establishes that reducing waste in the hotel industry in Eastern India has both environmental benefits and improvements in the commercial success of hotels. Hilton carried out a study that showed that portion control, staff training and monthly waste audits helped hotels greatly in cutting down on food waste and incremental costs, as well as in enhancing their image. One significant implication arising from the research is the need to factor environmental management of food waste as enhancing sustainability is good for business. In addition, the present study also recommend that the hotels of Eastern India could potentially donate leftover food to the food banks or any other charitable organization which will add social responsibly aspect as well. In conclusion, whilst adopting an integrated approach to food waste management appears to have sound financial appeals for the hospitality business it is also instrumental to the growing calls for environmental sustainability by the customers. In integrating food waste management into their sustainability strategies there is a two pronged advantage to hotels in that they can reduce the negative impact on the environment as well as gain bargaining rights to those consumers who are environmentally sensitive. Other

organizations to which food is re-distributed also help eradicate cases and at the same time fosters good relations with citizens. Finally, by ensuring that their decision making process embraces sustainability, the various organizations involved in the hotel business in Eastern India create a niche for themselves and guarantee that a lot of environmentally conscious tourist will consider patronizing them.

RECOMMENDATIONS :

1. Hotels should prioritise portion control and conduct regular waste audits to identify and address areas of high food waste.
2. Staff training programmes focused on waste reduction should be expanded to ensure that employees at all levels understand the importance of minimising waste.
3. Hotels should collaborate with local food donation programmes to reduce edible food waste and support community initiatives.

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