



# To what extent does the hospitality industry contribute to the food waste problem and how can they manage this?

*Janhavi Garg  
Student  
Welham Girls' School*

## Abstract

Food waste is a pressing problem in our world today. This paper sets out to conduct a thorough analysis of food wastage starting by conducting a literature review to evaluate its social, economic and environmental implications. The paper then proceeds to focus on hospitality establishments such as hotels and restaurants and highlight their extensive contribution to the food waste problem as a result of the deeply embedded practices practiced by them. The paper finally provides an analysis and evaluation of certain strategies that may be adopted to minimize the contributions of such establishments to the food waste problem.

## Introduction

*Food is supposed to fill people's stomachs but why is it filling landfills instead?*

Many people across the world sleep without food and people who are privileged waste food every day. Food waste is defined as “food appropriate for human consumption being discarded, whether after it is left to spoil or kept beyond its expiry date” (Ishangulyyev, Kim and Lee, 2019). Whilst many factors may cause food waste, some of the most common are when individuals exceed the limit of buying, poorly plan, over-prepare food or then end up with out-of-date or spoiled food due to negligence or even improper storage.

Food waste is a great threat to the economy, society and the environment (Ishangulyyev, Kim and Lee, 2019). For instance, on an economic front, it represents a waste of financial resources. For society, food waste is a representation of a poor distribution of resources - whilst great percentages of food are wasted, 79 million people are living below

the poverty line and rarely can access food (Seberini, 2020). On an environmental front, it represents a waste of natural resources and other resources used to grow that crop or food. Moreover, most wasted food ends up in landfills which leads to the release of several greenhouse gasses i.e. the contributing gasses to the pressing climate change issue.

According to the United Nations, around 7.6 billion people stay hungry, as per the FAO, one-third which is approximately 45 percent of the food is wasted every year (Swanson, 2021). All countries, both developing and developed, contribute to this problem in their own ways. In developing countries, food wastage happens postharvest and processing stage and is most commonly caused by a lack of proper infrastructure for transport and storage, poor practices, labour restrictions, etc. Developed countries, including those in Europe and North America, produce 56% of the world's waste. Of this, 40% of waste in developed countries occurs in the consumption stage, which is due to consumer behaviour, values, and attitudes (Ishangulyyev, Kim and Lee, 2019).

Many industries contribute to the food waste problem, however, the hospitality industry consisting of hotels and restaurants, particularly, contributes very greatly. However, many different strategies can be practised or implemented to minimize food wastage from such establishments. In line with the aforementioned, this research paper aims to answer the question “*To what extent does the hospitality industry contribute to the food waste problem and how can they manage this?*”

### **The Food Waste Problem**

As briefly mentioned in the introduction, food waste refers to food which is discarded as a result of being deemed unfit for consumption before reaching consumers or then as a result of excessive purchase by consumers. As may be evident in the aforementioned explanation, food waste occurs at almost all steps of the supply chain i.e., production, storing, processing, distribution, and consumption (The World Counts, 2023).

At the *production* level of the supply chain, for instance, food waste may occur due to a myriad of reasons. These include but are not limited to; food waste due to excessive production which surpasses demand, external factors such as climatic conditions having the potential to damage or reduce the quality of the harvested crops, incorrect dosage of fertilizers causing the disease to the crops making them unfit for consumption and farmers leaving crops unharvested in the case that the transportation and labour costs are higher than the price in the market (Swanson, 2021). Moving further to the stage of *storage*, when the food is stored incorrectly, it lessens its life expectancy and most often gets spoilt by the time it reaches the consumer. Moreover, even during the process of converting food into packaged products, a huge amount of food is wasted because of high standards that are set for the produce which is to be sold (Swanson, 2021). Unfortunately, even after so much food is wasted, households, aka the primary consumers, fuel the problem of food wastage even further. For instance, people serve more than they can finish and

the leftovers go into the dustbins. Sometimes they even tend to buy more and then it goes into the dumpyard when it expires. Many specific establishments such as hotels and restaurants tend to be the primary contributors at this level (Li and Pan, 2021).

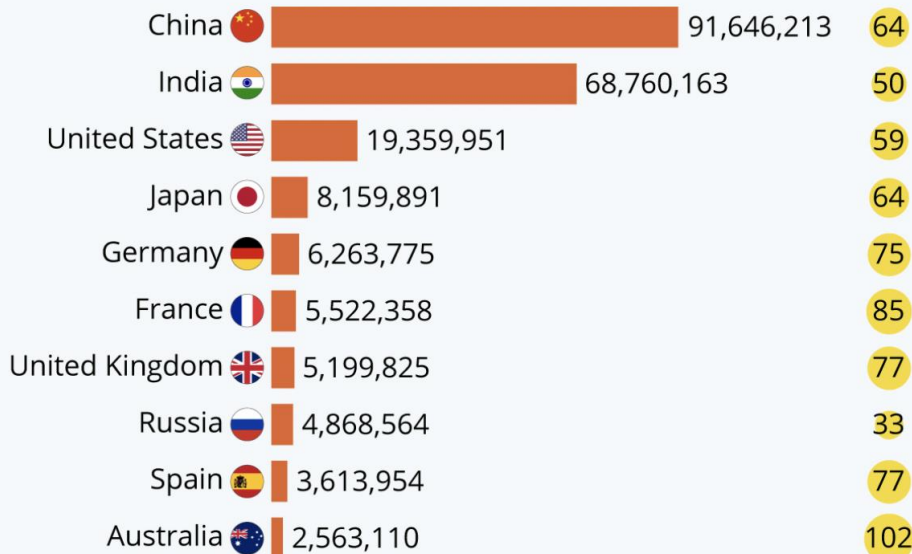
Food waste is a huge and complex problem globally, in developing and developed countries. With regard to the difference in food wastage patterns in developed and developing countries, it has been commonly observed that in the former countries, the majority of food wastage occurs at the consumer stage where plenty of purchased produce ends up wasted as a result of over purchase or incorrect maintenance. On the other hand, developing nations witness a greater amount of food wastage in the beginning stages of the supply chain due to a lack of basic facilities like poor infrastructure, inadequate storage areas and food safety protocols (Tarbox, 2020). However, as populations are increasing, a greater level of food wastage at the consumer level is being observed regardless of whether it is in the context of a developed or a developing country. For instance, as can be seen in the graph below, several developed countries including the USA and Japan are responsible for great levels of annual household food wastage. That being said, the countries with the highest annual household wastage are China and India - whilst these may be deemed newly developed or developing countries, the mere population of these countries implies a greater level of potential wastage at the latter end of the supply chain.



# The Enormous Scale of Global Food Waste

Total annual household food waste produced in selected countries\*

- Total food waste per year (tonnes)
- Estimated food waste per capita (kg)



\* UNEP estimates with high or medium confidence  
Source: UNEP Food Waste Index Report 2021



statista

(McCarthy, 2021)

We grow crops in such large quantities that all of us can be nourished twice but here comes a fact - one in nine of us is undernourished because the other eight waste so much food that it is difficult for everyone to get it. There are around 800 million undernourished people (TBYW, 2019). The number of people who were undernourished was falling from 2005 to 2014 but it has now started to increase again. Food waste has severe implications for society. Food is a basic necessity which one should receive properly without any interruptions and food waste brings up ethical concerns regarding the incorrect distribution of resources. In European countries, for example, people waste or throw away 50% of the food which can be utilized, this was noticed by the European Parliament Committee of Agriculture (Seberini, 2020). In a world where millions of people suffer from malnutrition, food wastage is simply unacceptable.

Food is lost at every level and in developed countries the losses are post-retail and consumer level. They range between 124 and 154 kg per capita per year and come at a high economic cost, estimated between 10–25% of households' annual food expenditures (Makov et al., 2020). In developed countries, food waste affects the pricing

policy. With an increasing number of people and increasing demand a lot of food is generated causing food to be expensive. Due to this, people who cannot afford expensive food are more at risk. Since food waste represents a major public policy issue, it has recently been included in the United Nations Sustainable Development Goal, “Responsible Consumption and Production”, which aims to halve “per capita global food waste at the retail and consumer level and reduce food loss along production and supply chains by 2030” (Seberini, 2020).

Not only does the food cause food insecurity but also causes environmental problems. Wasting food is indirectly wasting natural resources like fuel, water and energy. Research states that food waste causes a huge amount of methane and an increase in greenhouse gases. Almost one-third of greenhouse emissions are due to the wasting of food and after fossil fuels and livestock, landfills, where wasted food ends up, are the third largest producer of methane (Boyle, 2021). Interestingly, the carbon dioxide produced by food waste is so much that it has been observed that “If food waste was a country it would be the third largest producer of carbon dioxide after the US and China” (Boyle, 2021). “A kilogram of food waste produces almost two kilograms of carbon dioxide equivalent emissions and consequently results in the exhaustion of 2.9 tons of natural resources, including species extinction and loss of biodiversity” (Kundamal, 2022). Other environmental issues of food waste relate to the use of plastic throughout the supply chain. According to the EPA data 82.2 tons of plastic was generated in 2018 for the food industry. This is incredibly dangerous as plastic takes about 100 years to decompose and can cause plastic pollution if wasted in huge quantities (Young, 2021). All the aforementioned highlights how food waste is a major driver of climate change.

Overall, it would not be an exaggeration to say that wasting food is one of the biggest crimes we can partake in. Food waste has dire implications for society, the economy and the environment.

### **Contribution of Hotels and Restaurants to the Problem**

As mentioned in the previous section, hospitality establishments including hotels and restaurants are major contributors to the food waste problem. As per research conducted, around 40% of the food is wasted by consumer service businesses like hotels and restaurants (Troitino, 2017). The reason for this is that these types of establishments follow certain practices which have tendencies to further worsen the issue of food waste. Some of these practices have been analyzed below

*Buffet and Self-Service Operations:* It is common practice for hospitality establishments such as restaurants and hotels, more particularly, to serve buffets during all three meals. The hotel industry always aims to make more food than necessary in order to ensure guest satisfaction and minimize any negative feedback arising from insufficient food. With regard to the buffets, there are some common trends noticed wherein hotels are able to apportion the food for breakfast better than for lunch or dinner due to having a clearer sense of guest

numbers etc. For instance, as per primary research conducted with the manager at the Westin Hotel, it was found that the breakfast cooked and served was most often consumed in its entirety. However, food wastage patterns tended to be higher during lunch and dinner. At the time of visiting, for example, dinner was made to feed 60 guests whilst it was ultimately consumed by only 20. The remaining 40 people's food went directly to waste. Moreover, secondary research findings suggest that 108 billion pounds of food from buffets is wasted in the United States. The aforementioned highlights a great problem wherein the wastage that is derived from buffets occurs due to foundational practices followed in the hospitality industry and the need for this to be amended is more pressing than ever before (Kundamal, 2022).

*Overproduction and Improper Portioning:* In the hospitality industry, reputation takes precedence. Many hotels and restaurants follow a pattern of overproduction particularly of food, in order to ensure that supply never goes short for customers. In line with this, the concern regarding inconsistent portioning arises wherein some hotels and restaurants may believe in serving comparatively larger portions of food to maintain customer satisfaction. Oversized portions often result in leftover food that is ultimately discarded.

*Food Spoilage and Expiration:* As mentioned above, every brand wants to have its name, to keep that they have to fulfil their consumers' needs. Every hotel or restaurant piles extra food which is not required and this food goes to the bin when it is expired and spoiled (Henderson, 2021). Not only this, five-star hotels usually display food as decorative pieces. This is a very bad idea as it is another step which leads to food expiration if not viewed on time. Restaurants need to monitor their inventory levels regularly to ensure that food items are used before their expiration dates. If food is not used in a timely manner, it may go bad and become unsuitable for consumption. One of the main factors is the cross-contamination of food. If one food item is infected, it affects the food kept with it. The bacteria is spread from one part to another and if not taken care of, mostly the food which is in contact can also

### **An Evaluation of the Strategies Available to Hotels and Restaurants for Reducing Food Waste**

It is vital that corrective measures are taken to minimize the practices that lead to unprecedented levels of food waste from hospitality establishments like restaurants and hotels. Whilst many strategies may exist, the following are some which have proven successful when applied by hospitality establishments globally:

*Menu Planning and Portion Control:* When it comes to menu planning, data can be an incredibly valuable tool for hospitality establishments. For instance, “menu engineering is the process of evaluating menu pricing and item placement in order to increase profitability per guest” (Sling, 2019). Whilst menu engineering may be used as a strategy to enable an increase in profitability, it can also be very helpful in analysing food popularity and adjusting offerings accordingly. In addition to deciding and maintaining popular and

profitable food items on the menu, such an approach may also help with the problem of portion sizing. The reason portion control and correct sizing are essential is because previous surveys conducted have found that smaller sizes of plates can in fact lead to a reduction in food wastage by 25% (Juul, 2016). A company called Apicbase, in Belgium, is a prime real-life example of a company which is using data to reduce its food waste. This company takes all sorts of kitchen data and by analyzing the data the company calculates the needed orders and prepares the food accordingly at a cheaper price (Barlow, 2002).

*Inventory Management and Purchasing Practices:* One of the best ways to help prevent food waste is adopting a limited stocking strategy, especially for perishable goods (Jain, 2022). Many practices like First in First out (FIFO) and Just-in-Time (JIT) inventory are practised by the food industries. For instance, by implementing FIFO, establishments can ensure that perishable goods which were purchased are used in the correct order so their spoilage and eventual wastage are minimised (Walle, S and N, 2022). One cannot use the food when it is expired but they can use it closest to the expiry date, reducing or eliminating the opportunity for the product to go to waste. Subway and McDonald, both are huge food chains that are known to use FIFO to minimize the amount of food they waste.

*Food Donation and Redistribution:* Hospitality establishments can partner with local food banks, charities, and shelters to donate excess food that is safe for consumption. A hotel or restaurant can't go completely food waste-free. However, in order to minimize food waste even further, such establishments can direct the resources towards those who are underprivileged by donating them to them. For example, Omni Hotels in America has established a Say Good Night to Hunger program in collaboration with the American Feeding Charity whereby they donate at least one meal per day to a person in need for every booking made. That adds up to nearly nine million meals a year (Reymond, 2020) Touring with the Heart, Pack for Purpose and Charity Cruises are a few of the other organizations which help starving people every day and feed at least nine billion people every year.

*Technology-driven Solutions:* Technology is one of the most popular ways nowadays by which food wastage is controlled. Around the world, there are many smartphone apps which help you to re-allocate food from supermarkets, restaurants and other establishments. In specific this has led to the creation of applications such as Too Good To Go. Restaurants and hotels can make use of applications like Too Good To Go to sell their leftover food at discounted rates at different times of the day. Many European food industries have enrolled on this application and its aim is to reduce food waste. To do this, this app takes several measures, for instance, it provides food which is not sold throughout the day at a very cheap price to the consumers at night (Christian Mouysset, 2023). Flash Flood in Toronto is a similar app which sells groceries at a discounted price when the food is near its expiry date.

*Further strategies:* Even the food which can not be directed elsewhere can still be made useful as opposed to simply being discarded. For example, such food can be decomposed and made into compost. This food can also be helpful to fill an animal's stomach and feed the birds. There is a renowned company, SeaB Power, that has planted an anaerobic digestion system. This system facilitates in building accessibilities to turn biofuel into organic fuel (Pardo, 2021).

## **Conclusion**

Many people across the globe sleep hungry or even die due to hunger but the privileged ones waste food. Food waste in today's time is a huge problem which should be properly looked after. But, this problem is neglected and this is a great concern. The problem is further triggered by the fact that food is wasted at every step of the food chain, that is, production, storing, distribution and consumption.

Amidst those contributing to the problem, the hospitality industry contributes to the problem to a great extent with it being reported that around 40% of food is wasted by the establishments in this industry. The reason for this boils down to certain practices which have long been employed by such establishments including buffet and self-service, overproduction and improper portioning and food spoilage and expiration. As the food waste problem is continuously worsening, there is a requirement for such establishments to reevaluate their practices and make an active effort to adopt certain strategies which can minimise their respective food waste. In line with the aforementioned, this research paper discussed strategies along the lines of menu planning and portion control, innovative approaches to inventory management and purchasing practices, food donation and adoption of technology-aided solutions.

It goes without saying that as the hospitality establishments start making the required changes, the difference in food waste will be felt as will the benefits to all stakeholders including society, the environment and the economy.



**Bibliography**

- Barlow, G.L. (2002). Just-in-time: Implementation within the hotel industry—a case study. *International Journal of Production Economics*, 80(2), pp.155–167. doi:[https://doi.org/10.1016/s0925-5273\(02\)00315-8](https://doi.org/10.1016/s0925-5273(02)00315-8).
- Boyle, K. (2021). *How Does Food Waste Affect the Environment?* [online] leadthechange.bard.edu. Available at: <https://leadthechange.bard.edu/blog/how-does-food-waste-affect-the-environment>.
- Christian Mouysset (2023). *15 Emerging Technologies Helping Reduce Food Waste*. [online] Lightspeed POS. Available at: <https://www.lightspeedhq.com/blog/food-waste-emerging-technologies/>.
- Haraminac, E. and Michigan State University Extension (2014). *Keep food safe by implementing the 'FIFO' system*. [online] MSU Extension. Available at: [https://www.canr.msu.edu/news/keep\\_food\\_safe\\_by\\_implementing\\_the\\_fifo\\_system#:~:text=FIFO%20is%20E2%80%9Cfirst%20in%20first](https://www.canr.msu.edu/news/keep_food_safe_by_implementing_the_fifo_system#:~:text=FIFO%20is%20E2%80%9Cfirst%20in%20first).
- Henderson, C. (2021). *5 Common Causes And Prevention Of Food Spoilage For Restaurants*. [online] Restaurant Manager. Available at: <https://www.rmagazine.com/articles/5-common-causes-and-prevention-of-food-spoilage-for-restaurants.html> [Accessed 13 Nov. 2023].
- Ishangulyyev, R., Kim, S. and Lee, S.H. (2019). Understanding Food Loss and Waste—Why Are We Losing and Wasting Food? *Foods*, [online] 8(8), p.297. doi:<https://doi.org/10.3390/foods8080297>.
- Jain, A. (2022). *How To Control Food Wastage In Hotel Industry|Blog\_QloApps*. [online] Open Source and Free Hotel Booking Management Software. Available at: <https://qloapps.com/how-to-control-food-wastage-in-hotel-industry/>.
- Juul, S. (2016). *How To Control Portions and Reduce Food Waste*. [online] HuffPost. Available at: [https://www.huffpost.com/entry/portion-control-reduse-food-waste\\_b\\_9022674](https://www.huffpost.com/entry/portion-control-reduse-food-waste_b_9022674).
- Kundamal, R. (2022). *The Unsustainability of Buffet Food Waste*. [online] Global Research and Consulting Group Insights. Available at: <https://insights.grcglobalgroup.com/the-unsustainability-of-buffet-food-waste/>.
- Li, H. and Pan, P. (2021). Food Waste in Developed Countries and Cold Chain Logistics. *E3S Web of Conferences*, 251(03001). doi:<https://doi.org/10.1051/e3sconf/202125103001>.
- Makov, T., Shepon, A., Kronos, J., Gupta, C. and Chertow, M. (2020). Social and environmental analysis of food waste abatement via the peer-to-peer sharing economy. *Nature Communications*, 11(1). doi:<https://doi.org/10.1038/s41467-020-14899-5>.

McCarthy, N. (2021). *Infographic: The Enormous Scale Of Global Food Waste*. [online] Statista Infographics.

Available at: <https://www.statista.com/chart/24350/total-annual-household-waste-produced-in-selected-countries/>.

Pardo, P. (2021). *Food Waste in the Hospitality Industry: Innovating to Reduce It*. [online] Plug and Play Tech Center. Available at: <https://www.plugandplaytechcenter.com/resources/food-waste-hospitality-industry-innovation/>.

Reymond, N. (2020). *Hospitality's role in driving sustainability and community projects*. [online] [hospitalityinsights.ehl.edu](http://hospitalityinsights.ehl.edu). Available at: <https://hospitalityinsights.ehl.edu/hospitality-implementing-sustainability-giving-back-communities#:~:text=Omni%20hotels%20and%20resorts%20throughout%20the%20US%20have>.

Seberini, A. (2020). Economic, social and environmental world impacts of food waste on society and Zero waste as a global approach to their elimination. *SHS Web of Conferences*, [online] 74(03010), p.03010. doi:<https://doi.org/10.1051/shsconf/20207403010>.

Sling (2019). *Menu Engineering: What It Is And How It Can Increase Profits*. [online] Sling. Available at: <https://getsling.com/blog/menu-engineering/>.

Swanson, M. (2021). *The 6 Stages of Food Loss and Waste*. [online] PostHarvest. Available at: <https://www.postharvest.com/blog/the-6-stages-of-food-loss-and-waste/>.

Tarbox, N. (2020). *Food Waste Around the World Examined*. [online] The Borgen Project. Available at: <https://borgenproject.org/food-waste-around-the-world/>.

TBYW (2019). *The Social Impact of Food Waste*. [online] TasteBeforeYouWaste. Available at: <https://www.tastebeforeyouwaste.org/post/the-social-impact-of-food-waste>.

The World Counts (2023). *Wasted Food Statistics*. [online] [www.theworldcounts.com](http://www.theworldcounts.com). Available at: <https://www.theworldcounts.com/challenges/people-and-poverty/hunger-and-obesity/food-waste-statistics>.

Troitino, C. (2017). *The Tragedy Of The Buffet Commons: Reducing Food Waste At Hotels*. [online] Forbes. Available at: <https://www.forbes.com/sites/christinatroitino/2017/09/14/the-tragedy-of-the-buffet-commons-reducing-food-waste-at-hotels/?sh=664ae97717dc> [Accessed 13 Nov. 2023].

Walle, G.V.D., S, M. and N, R. (2022). *First In, First Out (FIFO): What Food Handlers Must Know*. [online] FoodSafePal. Available at: <https://foodsafepal.com/first-in-first-out-fifo/>.

Young, O. (2021). How Does Food Waste Really Impact the Environment? *TreeHugger*. [online] 6 Dec. Available at: <https://www.treehugger.com/food-waste-environmental-impact-5211807>.