

# Studies on the Reduction of Food Waste through Redistribution of Unused Excess Food

(Redistribution of Unused Excess Food)

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**Abstract:-** Food waste generated in the foodservice industry has significant environmental and economic consequences [5]. People are usually aware of the problems in food wastage, but due to inadequate opportunities for them to help, they do not take action on it. This study looks at the development of a method for redistributing unused food to labour camps that do not have access to a local food bank or nutritious food. A qualitative study on the causes of food waste in restaurants and catering businesses was conducted to better understand and explain the complex issue of food waste in order to implement a method to address the problem. Three interviews were conducted with personnels from three different catering companies to collect research data. The findings revealed the complexities of food waste management in the food service industry, as well as the importance of a comprehensive approach to preventing and reducing it. Hotels generate 79,000 tonnes of food waste per year, while restaurants generate up to 199,100 tonnes. A large portion of this food waste can be avoided if it is used rather than discarded. This research aims to achieve a target by providing a structured system to cater to the needs of the restaurants and the labour camp. Based on a qualitative content analysis, the factors influencing food waste in each company were identified and an effective solution to the problem was recommended.

**Keywords:-** Food, Hospitality, Service, Hotel, Restaurant Food Wastage, Labour Camp, Redistribution, Food Service Industry, Food Bank, EIP, Non Profit, Management, Waste Mitigation, System.

## I. INTRODUCTION

A hypothesis was formulated on how to create an efficient system for distributing food to labour camps that do not have access to food banks or nutritious food, while also reducing food waste in hotels and restaurants. This method intends to address the problems faced by restaurants in managing their food waste by allocating it to labour camps using a methodical approach by providing an efficient system that allows restaurants to distribute the food, and supply the labourers with an adequate meal. This intends to bridge the problems faced by restaurants in managing their food waste. The study focuses on the SDG 2: Zero Hunger and SDG 12: Responsible Consumption and Production, and thinks about ways to reduce food wastage. SDG 2.1 aims to end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including

infants, to safe, nutritious and sufficient food all year round, by 2030. SDG 12.3 aims at halving per capita global food waste at the retail and consumer levels and reducing food losses along production and supply chains, including post-harvest losses. As today's youth, looking to help create a better future, this was a topic that really resonated with us, and which prompted us to devise a plan to solve the problem. The methodological approach proposes to collect the food from the restaurants, and pack it safely, keeping in mind the health and hygiene regulations. It has taken into consideration the medically concerning elements and will be sure to strictly regulate the procedure. Moving ahead the responsibility of directing the system is delegated to the facility manager, thus ensuring a coherent operation of the system, as they would be more familiar with the site and storage options. This induces an orderly procedure for both sides of the party. The world's population is expected to increase by 2 billion over the next 30 years, reaching 9.7 billion in 2050. Food production, however, will not increase enough to ensure food security for the world's population. Cutting the world's current food waste down to zero would feed 2 billion people and eliminate food insecurity now and in the future. This project can open up to new possibilities in obliterating food wastage. Materials Flow Analysis (MFA) for a lunch buffet and MFA results for a lunch buffet vs. a wedding buffet at UAE hotels are shown in figures 1 and 2.

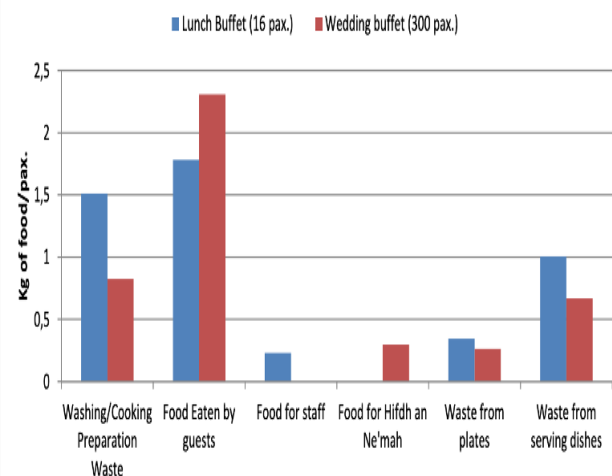


Fig. 1: Materials Flow Analysis for a lunch buffet vs. a wedding buffet at UAE hotels [1]

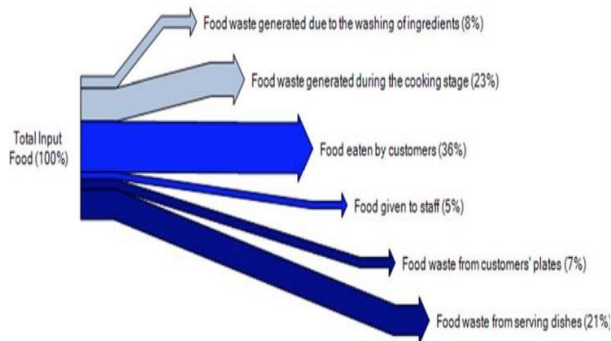


Fig. 2: Materials Flow Analysis for a lunch buffet at a UAE hotel. [1]

**II. MATERIAL AND METHODOLOGY**

According to the Food Sustainability Index, the hotels of UAE waste 224kg of food per person per year, while the United States and Europe waste around 100kg. Food waste causes a significant economic loss and has a negative impact on the environment and food security. According to estimates, food that is not consumed accounts for 8-10% of global greenhouse gas emissions released into the atmosphere. Under these studies the people who work in hotels and restaurants were interviewed to get a better understanding of how to work with them to reduce food waste. The manager of Salinda Resort was spoken to learn more about the problems they face with food waste. The information was gathered to effectively implement the process in the field.

The first step in this process is to acquire a vehicle that has been modified to store food. This, along with transportation costs, will be one of the expenses. The vehicle must be capable of safely storing and transporting food from hotels to labour camps. To reduce environmental damage, large metal containers were chosen over disposable plastic containers, so these vessels will need to be washed on a regular basis. To address the concerns of the labourers and to hear their side of the story, and to confirm the safe storage of the food, the storage facilities with the Facility Manager of the labour camp were analysed. The handover of operational responsibilities to the facility manager after the food is delivered would ensure a smoother operation of the system because they would be more familiar with the site and storage options.

This also corroborates the integration of this system with their previous food distribution system. The health of the workers is of the utmost importance; thus, the system's implementation must take into account any medical concerns about the food, such as allergies. The project also considered research on UAE Food Safety Laws such as the Federal Food Safety Law, which imposes standards and regulations for maintaining food safety and quality while also protecting public health and consumers. As a result, project implementation also necessitates approval from municipal authorities in the emirate where the project will be initially carried out. The hierarchy of response to food waste is shown in figure 3.

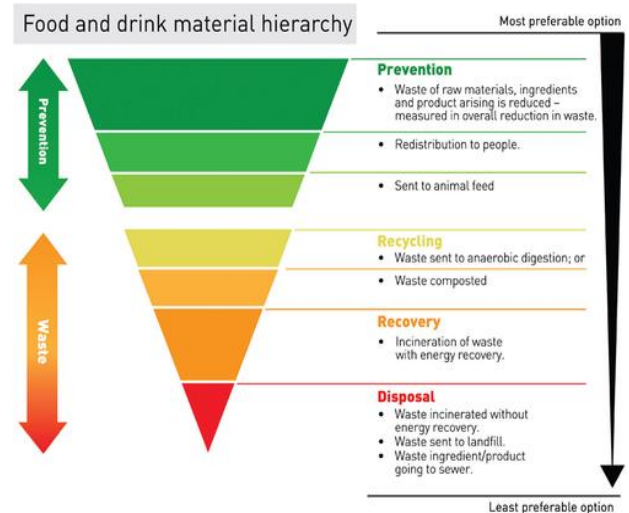


Fig. 3: Hierarchy of response to food waste. [2]

**III. RESULTS AND DISCUSSION**

Preventing food waste is a huge global challenge to the environment's, society's, and economy's long-term sustainability and security. In response to that dilemma, plenty of projects, including our own, targeting food waste have sprouted up in recent years [3]. The issue of food wastage is global in nature. The National reported on Dubai's food waste problem, which is intensified by hotels and restaurants wasting supplies on excessively large portions of food. The most direct way to reduce food waste is to avoid it altogether. By being mindful of the food it discards, the hotel industry can help to reduce its carbon footprint. Most of the food waste in hotels is caused by overproduction in kitchens. Buffets are a classic example of food overproduction; an abundance of food is displayed to please customers, and most of the food is thrown away as a result. However, overproduction is simply a result of people's desire to overindulge, which sets off a chain reaction. In the UAE, food waste accounts for approximately 38% of all food prepared each day, rising to 60% during Ramadan. Apart from harming the country's economy, the decomposition of food waste emits methane gas, which is reportedly 25 times more harmful than CO<sub>2</sub>. Food waste is one of the region's most pressing issues, particularly during Ramadan. The analysis on food wastage in different countries is shown in figure 4. During the holy month, the demand for meat, vegetables, fruits, and dairy products increases by approximately 50%. One-third of this is wasted.

Due to the pandemic, it has not been possible to test our procedure, and get adequate statistical data to compare. It has been anticipated that the methodology will be able to reduce this percentage of food waste and it is intended to test this hypothesis as soon as possible.

IV. CONCLUSION

Food waste certainly has an impact on global sustainable development, and the facts demonstrate that negative environmental impact would be mitigated if the amount of food waste on a global scale decreased. Due to the numerous operational activities, it is not possible to eliminate food waste entirely in the hospitality industry. Through well-planned implementation of this system, the wastage of food would decline, and many adverse effects averted. [4]

Although many people are aware of the issues surrounding food waste, only a small percentage of the growing population takes action to help the cause. This is most likely due to the lack of systems in place to address the issue of food waste, to which today's youth can contribute. Food loss and waste can risk the long-term viability of our food systems. When food is lost or wasted, all of the resources used to produce it, including water, land, energy, labour, and capital, are wasted. Furthermore, the disposal of food waste and loss in landfills contributes to greenhouse gas emissions, which contribute to climate change. Food loss and waste can also have a negative impact on food security and availability, as well as contribute to rising food prices hence indirectly affecting us humans and other wildlife.

Food waste has serious economic, environmental, and social consequences. Although the magnitude and complexity of the global food waste problem have pushed it to the forefront of the environmental agenda, little research has been conducted on the patterns and drivers of food waste generation, particularly outside the household, due in part to flaws in the methodological approaches used to comprehend such a complex problem. However, in addition to environmental degradation, there is a significant economic setback, with the world wasting 1.3 billion tons of edible food each year, equivalent to one-third of global production, enough to feed 3 billion people, according to a United Nations Food and Agriculture Organization report. The monetary value of this wasted food is estimated to be \$680 billion. This research aims to achieve a target by providing a structured system to cater to the needs of the restaurants and the labour camp. This project is an apt way to address this issue, and it strongly believes that it is beneficial to the environment by assisting in the reduction of the ecological footprint, as well as suitable for today's growing population. As today's youth, the authors believe that the virtues of this system can help the future generations overcome this issue.

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Fig. 4: Food wasted per person in various countries

According to the findings, a significant amount of food is thrown away in the UAE. This can be due to a variety of factors, including overbuying of food, purchasing in bulk as hotels or restaurants would, and food spoilage when it goes unused. This food can be used to feed people in labour camps, eliminating the need for them to travel to established food banks. The proposed system benefits both the workers who need the food and the hotels or restaurants with which we work. It will enable hotels to distribute unused food without wasting their time delivering it, while simultaneously arranging a service that is accessible to workers who may not have admission to food banks. If this system is implemented, it has the potential to significantly reduce food waste caused by hotels' strict policies governing what food can be served to hotel guests. It can also provide better food quality to the labourers, which the camp may not be able to accomplish due to limited funds and a large number of residents. Workers may dislike the food served in labour camps due to religious beliefs, and they may also feel homesick if they only have the option to eat food that is not of their native country or region. The system will give them more regular options without requiring them to buy the food themselves. There are some limitations to this service. The cold-storage vehicle that transports the food, as well as the washing of the large vessels, will incur costs. We would have to rely on donations and recruit volunteers to help with delivery and cleaning because we would be a non-profit. These limit the services we can offer; for example, during a pandemic, when volunteering would be impossible due to health and safety concerns. More research and testing of this process will allow us to experiment with solutions to these constraints.

**REFERENCES**

- [1.] Pirani, Sanaa I. and Hassan A. Arafat, 2016. Reduction of food waste generation in the hospitality industry. *Journal of Cleaner Production*, Volume 132, 129-145
- [2.] 2021. “Redistributing surplus food.” *Food Science and Technology*, Volume 35, 24-27
- [3.] Messner, Rudolt et al. ,2020. The “Prevention Paradox”: food waste prevention and the quandary of systemic surplus production. *Agriculture and Human Values*, Volume 37, 805-817
- [4.] Kilibarda, Nataša et al.,2019. Food Waste Management—Reducing and Managing Food Waste in Hospitality. *Meat Technology*, Volume 60, 134-142
- [5.] Okumus, Bendegul et al. ,2020. Tackling food waste in all-inclusive resort hotels. *International Journal of Hospitality Management*, Volume 88,
- [6.] <https://www.wastedive.com/news/study-consumers-are-aware-of-food-waste-but-dont-care-enough-to-stop-it/423156/>
- [7.] <https://www.dm.gov.ae/foodbank/facts-and-figures/>
- [8.] <https://www.thenationalnews.com/uae/abu-dhabi-labourers-eat-on-street-because-housing-rules-forbid-outside-food-1.568306>
- [9.] <https://www.news18.com/photogallery/india/with-million-of-tons-of-food-wasted-globally-in-2019-heres-how-much-we-actually-throw-away-in-gfx-3512393-2.html>
- [10.] [https://dcce.ae/press\\_releases/our-food-is-damaging-the-environment/](https://dcce.ae/press_releases/our-food-is-damaging-the-environment/)
- [11.] <https://modernrestaurantmanagement.com/the-problem-of-waste-in-hospitality/>
- [12.] <https://www.greenhospitality.io/post/food-waste-the-hospitality-industry-s-role>
- [13.] [https://dcce.ae/press\\_releases/our-food-is-damaging-the-environment/](https://dcce.ae/press_releases/our-food-is-damaging-the-environment/)
- [14.] <https://www.news18.com/photogallery/india/with-million-of-tons-of-food-wasted-globally-in-2019-heres-how-much-we-actually-throw-away-in-gfx-3512393.html>
- [15.] <https://www.thenationalnews.com/opinion/comment/2021/11/01/finish-whats-on-the-plate-and-lets-talk-about-food/>