

A Review of Food Waste Within the Food Service and Hospitality Sector: Mapping the Causes, Effects and Technological Opportunities for a Sustainable Future

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Abstract

Food production is a resource intensive process accompanied by a wide range of environmental impacts. To add insult to injury, almost one third of the food produced for human consumption is wasted on a worldwide scale, amounting to a total of 1.3 billion tonnes per year, rendering all of the resources utilized for producing, processing, transporting and packaging that food also wasted. Not only does this waste further deteriorate environmental impacts, but it also raises social and humanitarian concerns by increasing food insecurity. In 2019, the food service and hospitality sector was found responsible for nearly 26% of the total food waste and despite its wasteful character being politically acknowledged, this topic still remains quite understudied in the academic field. In this paper, a review is carried out to shed light on this aspect of food waste. Through the mapping of the causes, effects and technological opportunities emerging from academic papers published from 2002 to 2022, this paper aims to contribute to the understanding of the true magnitude of the issue by policy makers, practitioners, academics and consumers, and the identification of significant research gaps. After reporting descriptive statistics, a content analysis of the papers evaluated ensued, revealing several valuable insights. The review divulged that a number of programmes have been developed around the world to mitigate food waste in such operations through the provision of proactive strategies, consumer awareness, redistribution of excess food as well as recycling and composting. These programs are designed to create a "chain reaction" to encourage the industry to minimize food waste and subsequent environmental impacts, while increasing revenue and customer satisfaction. However, although the interest in the adoption of food waste management practices by food service and hospitality businesses has grown exceptionally, there is still no standardised methodology on how to assess the volume and characterise the content of food waste resulting from the operation of the food service and hospitality sector. Several state-of-the art technologies have started to be applied for such purposes, including artificial intelligence, machine learning, Internet of Things (IoT) and smart sensors as well as blockchain. However, even though there is evidence of successful mitigation, as evidenced by efforts made by food service and hospitality businesses on a

global scale, there is no comprehensive list of good operational practices that could be universally adopted and used in a single management framework.

Keywords: food waste; food service and hospitality sector; food security; blockchain; Internet of Things

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