

## RESEARCH ARTICLE

# Optimizing Surplus Food Redistribution: Leveraging Digital Platforms to Advance Sustainable Consumption

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## ABSTRACT

Reducing food waste is a critical global challenge, intertwined with broader goals of sustainable consumption and sustainable development. This challenge is addressed by surplus food mobile applications that connect restaurants with consumers to minimize waste and promote sustainability. This study employs the Attitude-Behavior-Context (ABC) theory to investigate the key features of these platforms that influence consumer attitudes and food waste reduction behaviors, contributing to sustainability. Utilizing Integrated Generalized Structured Component Analysis (IGSCA) alongside single Necessary Condition Analysis (NCA), we examined features such as real-time listings, sustainability messaging, accessibility, discounted pricing, and charitable collaborations. Results indicate that real-time listings, sustainability messaging, accessibility, and charitable collaborations are crucial for fostering positive consumer attitudes and driving effective food waste reduction, while discounted pricing did not significantly impact attitudes. Complemented by necessity logic, these findings extend the ABC theory by emphasizing the essential role of specific contextual factors in promoting sustainable behaviors. Practically, the study offers actionable insights for platform developers to prioritize essential features, enhancing consumer engagement and contributing to the reduction of food waste in alignment with sustainability objectives.

## 1 | Introduction

Minimizing food waste and its associated environmental, social, and economic effects has emerged as a significant global concern in recent years (Magno and Cassia 2024; Marouli 2024). Addressing this challenge is crucial for achieving sustainable development, as reducing food waste can mitigate greenhouse gas emissions, conserve resources, and promote social equity. Food waste, in particular, is a direct reflection of inefficiencies in both production and consumption systems, and tackling it requires a systems approach that integrates sustainability across the supply chain (Derqui and Filimonau 2024). One of the key targets of the United Nations' Sustainable Development Goals

(SDG), specifically SDG 12.3, is to substantially cut food waste at both consumer and retail levels by 2030 (UNEP 2024). As such, food waste reduction aligns with sustainable production and consumption (SPC) principles, which emphasize the efficient use of resources, equitable distribution, and the minimization of environmental impacts (Xu et al. 2025).

The foodservice sector is a major contributor to global food waste, responsible for a significant share of inefficiencies in the food system (Yong et al. 2024). Consequently, the sector plays a critical role in advancing sustainable consumption practices (Xu et al. 2025). To address this issue, innovative digital platforms, such as mobile applications are emerging as key facilitators of food waste

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