Chapter 11
Prospective Developments and Advancements in the Hospitality Sector for Eco-Friendly Waste Handling

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ABSTRACT

This investigation explores the evolving landscape of waste management in the hotel industry, emphasizing the pivotal role of sustainability. Smart waste management systems, powered by data analytics and IoT, revolutionize trash monitoring, enhancing operational efficiency. Blockchain ensures transparency, fostering responsibility throughout the supply chain. Material science innovations, aligned with the circular economy, drive a shift to biodegradable materials. 3D printing transforms on-site amenities, reducing packaging and transit impact. The industry, adapting to consumer sustainability preferences, promotes responsible consumption through guest empowerment and innovative engagement strategies. As hotels integrate AI for zero-waste practices, this chapter serves as a comprehensive guide for academia, policymakers, and industry experts navigating toward a more sustainable future.

1. INTRODUCTION

Against a backdrop of mounting environmental consciousness and a growing focus on sustainable operations, the hotel sector finds itself at a critical turning point. Innovative solutions are needed to address the challenge of striving to reduce its ecological footprint while also providing excellent visitor experiences. “Zero Waste Management,” an idea that seeks to redefine garbage as an investment in the future and is in line with the concepts of a circular economy, is at the center of this transition (Ayad & Shehata, 2014). Zero trash Management surpasses traditional methods of reducing trash. It captures a comprehensive mindset that pushes companies to reconsider how much waste they produce, reduce

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waste at the source, and recycle or repurpose things that were previously thrown away (Ture, 2015, 11, 5). This strategy calls into question conventional linear models of disposal and consumption and pushes the hospitality sector to embrace regenerative thinking. The moment when environmental responsibility and the guest experience converge becomes crucial (Zhang et al., 2019). According to (Coskun, 2022), there is a growing trend among guests to choose immersive experiences that align with their beliefs, such as sustainability. Superior visitor experiences no longer conflict with environmental responsibility; however, these goals are coming closer together (Wong et al., 2021). In order to combine comfort and environmental awareness, hospitality facilities are integrating sustainability construction techniques and materials into their infrastructure (Zhang & Lee, 2021). Water-saving fixtures, energy-efficient lighting, and eco-friendly amenities all improve visitor comfort while using fewer resources. According to (Dwyer et al., 2020), culinary offerings are changing to include organic, locally sourced, and seasonal ingredients. Restaurants are putting an emphasis on reducing food waste by partnering with food rescue organizations, creating creative menus, and composting (White & Smith, 2022) (White & Smith, 2023). Technology integration makes smart sorting and real-time waste monitoring possible, thanks to devices like the Internet of Things-enabled sensors (Dwivedy & Mittal, 2010). This promotes resource efficiency, reduces operating costs, and optimizes garbage collection routes (Awasthi, 2023).

In order to embrace the circular economy, hospitality organizations are doing away with disposable plastics, upcycling materials, and investigating closed-loop technologies that turn waste into new resources (Alnawas & Hemsley, 2019). The evaluation of waste trends, monitoring of developments, and optimization of waste management tactics are all becoming made possible by big data analytics (White & Johnson, Assessing the Long-Term Sustainability Impact of Waste-to-Energy Technologies in Cruise Ships: A Case Study Analysis, 2021). Cutting-edge technologies let visitors personalize everything about their stay, even the way they want to be treated. In addition to increasing visitor delight, this customization supports waste reduction goals. Zero Waste Management is emerging as a disruptive force in the hospitality sector as it embraces these future developments (Srinivasan et al., 2018) (Pagaldiviti & Roy, 2023).

This change represents a significant shift in perspective and operational paradigms and extends beyond recycling initiatives and trash cans (Goh & Jie, 2019). The hospitality industry's quest to reduce waste and increase sustainability (Bavik, 2016) is a reflection of both its environmental responsibility and guest pleasure efforts. The hospitality industry is leading the way in a new era when sustainability is not an afterthought but a fundamental principle that enhances the traveler's experience and protects the environment for future generations (Rai, 2016) (Tehrani et al., 2020). This is achieved by fusing environmental responsibility with the guest experience (Moscardo, 2019).

2. WASTE MANAGEMENT HIERARCHY

The waste hierarchy—also referred to as the waste management pyramid or hierarchy—is a system that describes how to manage trash in a way that prioritizes reducing its negative effects on the environment. The hierarchy is intended to direct waste management procedures by highlighting the most socially and environmentally appropriate approaches (Bowden, 2009). The stages of the hierarchy usually include the following, arranged in decreasing order of preference: