

EFFICIENT STRATEGIES FOR REDUCING, REUSING, AND RECYCLING WASTE GENERATED BY THE HOSPITALITY INDUSTRY ACTIVITIES

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Abstract

The hospitality industry, as a rapidly growing sector, significantly contributes to global waste production, including organic materials, plastics, and construction waste. Addressing this environmental challenge requires effective strategies for reducing, reusing, and recycling waste. This paper explores innovative approaches to minimize waste production, such as sourcing sustainable materials, optimizing processes, and educating stakeholders. Reuse practices, including the adoption of reusable packaging, donation of surplus food, and water recirculation systems, are highlighted as key sustainable solutions. Additionally, recycling initiatives like composting organic waste, selective sorting, and collaborating with recycling firms are essential components of a circular economy model. Despite challenges such as high initial investments and the lack of clear regulations, integrating sustainable practices can enhance operational efficiency, reduce costs, and improve brand reputation. The study emphasizes that implementing green strategies not only mitigates environmental impact but also strengthens the competitive edge of hospitality businesses.

Keywords: waste management, hospitality industry, sustainability, recycling, circular economy.

Introduction

Being the very development area, tourism and travel are accompanied by tremendous growth of any industry. In recent years, the handling of garbage that has been deemed ineffective for subsequent use is becoming more urgent, especially as, in the context of this paper, it is preponderantly found in hotel environments. This in itself is a consequence of increased global travel and tourism. The forthcoming issue arises when industrial output, which includes or accounted for plastics, food leftovers, and construction material everywhere, causes environmental damage and depletes resources [1].

It is urgent to address these issues within broader global sustainability endeavors, wherein the relevant United Nations Sustainable Development Goals (SDGs) have attributed them to responsible usage and production. Modern consumers, have become, or are rapidly becoming, environmentally conscious persons who are very much likely to demand credible, sustainable practice to lessen adverse ecological consequences by organizations. Green management is responsible for redressing the environment's ills and is quite effective in relation to its double impact on the brand as well as customer loyalty [6].

Worldwide governments are taking severe measures regarding environmental regulations forcing the hospitality industry to start considering adopting greener operational principles as businesses move toward more circular economy frameworks-designed for significant waste reduction and the efficient recapture of resources from the hospitality industry. Therefore, effective waste management has become not only necessary but also the key basis for future economic and ecological viability. The introduction of waste management innovation at an industrial level will transform this sector into a sustainable one, provided such innovations are adapted and applied [9].

The research aims to explore, study, and suggest efficient strategies where leftover waste is used within a circular economy among a hospitality industry reduction program. They handle what the industry needs, like innovative strategies to reduce waste production, in terms of sourcing

environmentally friendly production materials and optimizing operational processes. In this sense, practice includes reuse; e.g., reusable packaging and recirculating systems for water, and recycling activities, like composting organic waste and selective sorting.

The hypothesis guiding this research suggests that strategic sustainable waste management aimed at reducing environmental damage will significantly improve operational efficiency and enhance the competitive advantage of small hospitality businesses.

The methodological framework consists of a comprehensive study of the earlier-denoted literature, which provides a summary of known initiatives in sustainable waste management practices and their related consequences. A comparative analysis to be carried out is meant to evaluate and measure some instances of the efficiency of waste management implemented in hospitality organizations as a practical demonstration of reducing, reusing, and recycling. Furthermore, significant chains of hotels as case studies present very substantial aspects of practical benefits, supported by statistical data to assess the impact on operational costs, environmental performance, and consumer perceptions.

Results and discussions

The hospitality business ranks among the fastest growing sectors internationally but it does not come without penalties to the environment as the industry generates an enormous amount of waste. Hotels, restaurants, and other organizations that fall under the service sector produce a large mass of waste, including plastics, organics, construction debris, and various solid, and liquid waste types. The situation now needs a quick shift toward developing sustainable practices, especially considering the global environmental issues that are growing in importance at the same time as the circular economy model grows stronger and stronger. This aspect is very well echoed with quite a number of strategies available that reduce, reuse, and recycle waste as keystones of the transformation [1].

Waste source prevention forms one crucial step in addressing waste challenges. For instance, partnerships with suppliers employing minimal or reusable packaging prevent wastage at the source. Hotels and restaurants collaborate with local suppliers in this example, minimizing transportation, and excess packaging is thus discouraged and hopefully minimized [2]. Digital direction of processes is another efficient strategy. This could include the use of electronic menus to supplant the traditional form or even the introduction of electronic documentation requirements that would reduce paper use and increase operational efficiency [5]. Additionally, awareness of employees and customers must be raised via training programs and educational campaigns to inculcate behaviors that minimize waste production [6].

Another important pillar of sustainable waste management comes across as the reuse of resources. Investing in the purchase of reusable packaging such as durable cutlery and containers for food delivery has reduced plastic waste for single use [3]. Donating food also provides an excellent opportunity to minimize waste while supporting local communities. The World Tourism Organization (UNWTO) reports that at least 30% of the food waste generated by hotel restaurants could go to food banks or charities, reducing waste while addressing food insecurity [11].

Additionally, water recycling could help to conserve more water in the whole plan, e.g., where the hotel has some recirculation systems in place by which water can be reused for irrigation and for other needs at the hotel but not necessarily for drinking. And water-saving strategies go beyond basic ways of conserving water as recycling helps preserve resources to this end: Recycling technologies help hotels with recycling water for a lot of purposes and not merely use as clean potable water, but water-saving strategies go hand in hand with recycling. [10].

This, in particular, holds for recycling. This involves establishing sorting systems within operational areas to gain the most effective recycling of different substances-speeding up recycling for instance of plastic, paper, and metals [1].

This is the transformation of organic waste into valuable compost through the establishment of composting systems, especially in hotel kitchens. This in effect helps reduce waste at landfills [7].

Technologies add to the effectiveness of waste management techniques. For instance, anaerobic digestion systems think of ways to turn organic waste into biogas, as 3D printing also tacticizes recycled plastics. In this case, digital tracking and optimization of waste help streamline waste management.

Nevertheless, the obstacles to innovative ways of waste management are strong as typically the high initial expenses tend to create apprehensions among several companies to adopt the new system. That is not all; even worse, there are no standard rules concerning the issue; as a result, the practices are not consistent across sectors [8]. However, since employees resist changes, especially in organizations and management, adoption of the latter measures becomes increasingly difficult [6].

For all these reasons, if the mentioned problems are well addressed and properly striding in the right direction, the hospitality industry is expected to reduce its environmental footprint greatly, increasing improvement in operational efficiency as well as enhancing its competitive advantage.

The ongoing conclusion is that best practices against waste, i.e., reduction, reuse, and recycling, demonstrate improvements in the environmental footprint of hospitality companies and reductions in operational costs, presenting a more attractive market to sustainability-minded tourists. When properly implemented, these practices become a foundation for harmonizing business operations toward achieving global sustainability goals that include the Universal Sustainable Development The ability of Management to Realize Business Success Chances [6].

Further, studies indicate that effective waste management requires cointegrated efforts among market operators, government authorities, and local communities, which promote the integrated waste management model that will not only minimize environmental footprints but also promote the latest in a circular economy approach toward maximum economic and ecological sustainability [9]. It is the partnership effort that inspires innovation and builds trust among stakeholders, as did the growing role that hospitality played in the notion of sustainable development.

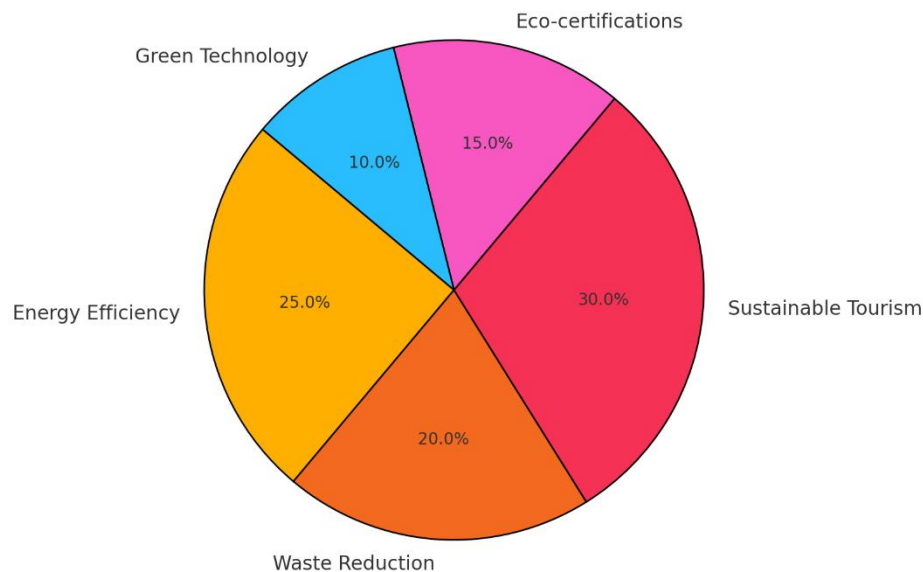


Figure 1. Impact of green economies on revenue in the hospitality industry [8].

Figure 1 provides the widely visited areas that sustainable practices accompany in the hospitality industry. Of this, the largest share-approximately 30%-goes straight into an area linked to sustainable tourism, which covers eco-friendly attitudes with regard to travel and accommodations. It embodies energy efficiency accounting for about 25% and emphasizes the importance of managing energy efficiently, since it has been achieved through renewable energy sources and new technologies. Then, waste reduction with 20% represents emphasis on sources as well as efficient processes through reducing waste i.e. minimizing it for reduced complications. 15% represents eco-certifications thus standardizing environmental criteria in internal assurance of sustainability into operations. Green technology accounts for 10%, focusing on solutions just like innovative such smart waste management systems and water

recirculation technologies. All those embedded components combine in a complete framework for looking at sustainability in the hospitality industry as a whole.

Production and consumption of services take a different shape than in manufacturing industries: Production is separated from consumption. Goods are produced, stored, sold and then consumed separately; however, service is rendered and consumed at the same time. Here, the producer and consumer are interlinked and, most importantly, physically integrated into the process of rendering the service-the inseparability of their roles [5]. The presence of the interacting parties creates an indicate a direct correlation; influence provides a dynamic means by which to assess the result of service quality on outcomes.

In terms of green economy principles, its dual delivery offers alternative spaces for sustainability embedding in every aspect of services' production; for instance, Six Senses Resorts, globally renowned as a leader in sustainable hospitality, uses renewable energy, discards single-use plastics, and supports local and organic food habits. Its ambitious program "Plastic Free 2022" helped shut down all operations using single-use plastics, recognized as something beyond industry standard. In addition, an organic waste composting plan has been put into place by reusing materials that would have otherwise ended up in landfills. These practices allow not only operational sustainability but also, define how tourism can yet resonate with their consciousness [9].

Equally, Marriott has shown commitment towards sustainability, with its "Serve 360" programme; some of the targets in this project include the reduction of food waste by 50%. Marriott is achieving this with its sustainability vision by including hotels in its campaign that engage customers in environmental-friendly practices such as easy-to-notice recycling containers and visible instruction on recycling. The result from this will be less environmental polluting and above all encouraging customers to stand loyal to a brand.

The simultaneity of service delivery also provides opportunities for consumer involvement in sustainable programs. Hilton's "Travel with Purpose" program integrates such sustainable practices in a few areas: like new sarlink generation buildings, water recirculation systems. Hilton hotels help encourage guests to consistently separate waste in designated bins, engage in towel reusing programs, and support local production of eco-friendly products. This way, the hotel is not just reducing its operational footprint but also allowing its guests to participate actively in sustainability initiative as it reinforces shared responsibility for environmental stewardship. [10]

Satisfying and hopefully exceeding customer expectations is highly crucial for getting a competitive edge in this highly customer-oriented industry. Service failings may lead to lost clients. However, great success is born with exceptional services that are aligned to such sustainability principles that normally ensure brand loyalty among clients that again could lead to positive word-of-mouth marketing. According to Kasim and Ismail (2019), these service quality standards help build trust among clients and inspire loyalty, vital factors to retention in an industry that is so competitive [6].

Quality in hospitality is going way beyond operational efficiency and extends to every part of the customer experience. "Quality is that that which perfects the required level of inherent characteristics," as stated by one International Organization for Standardization (ISO) standard. For a customer in the industry, this would be perceived as reaching or surpassing expectations at all times. In terms of quality and sustainability, these programs monitor guest satisfaction metrics-specific to environmental impact.

Problems in Implementation- Sustainable Practices. Despite the increasing magnitude of green initiatives in the hospitality industry, businesses are still faced with significant challenges in implementing sustainable business practices. Probably the most prominent barrier in doing so is the considerable financial investment necessary to revolutionize or adopt anything related to sustainable technologies and infrastructure. Coupled with high costs demanded by their installation, energy-efficient systems, water recycling facilities and stuff to that sort, super modern waste management will truly demand high upfront costs, which may deter many small or medium operators from jumping on board [8].

Other challenges that exist today include the lack of uniform global standards on sustainability; there are strict rules within the European Union, while in other places, guidelines may not be as

important. This makes the struggle more complex for large, multinational hotel chains that wish to have uniform and consistent sustainability practices in different countries. Equally, one comes to understand that most barriers to this change in architectures are within the same organizations: There is a lot of employee and management resistance against it.

The least awareness about green initiatives is present in consumer behavior in support for such practices. Many guests do not know anything or do not care about sorting waste or energy-saving measures to be taken in such properties. It has shown that education and informational duties are required to engage guests actively in being part of a sustainable journey.

Measuring and Monitoring Sustainability Performance. Success of these green strategies can only be measured, using well-designed monitoring and measurement tools, and will enable bench-marking and tracking of sustainability. Key Performance Indicators (KPIs) such as waste reduction percentages, energy savings, and carbon footprint reductions provide actionable business insights. For instance, Hilton's LightStay platform is set up to track environmental and social impact across all of its properties, and it allows the company to gauge progress against all these stated goals in its sustainability strategy.

Some other instruments like LEED (Leadership in Energy and Environmental Design) certification helps standardize the environmental performance of the facilities that are achieved in large competitive areas, and thus achieving a distinction; therefore, not only DTA metrics but also how much more attractive would the property become for eco-conscious travelers. Major stakes are maintained in this process, being processed through data to ensure accountability, sustainability, and continuous improvement.

Conclusion

The industry of hospitality continues to progress itself variable to not only meet but even exceed customer expectations. Overall customer expectations and service quality exceed what a person can easily associate with the hospitality industry against solid strategies. Apart from gaining the trust of one's clients and enhancing a good image for their brand, it can serve as even more reasons to attract and retain new customers. By promising what can be delivered and then delivering even beyond that premise, the client is further satisfied, as evidenced in the results of repeat business and loyalty. This is why exceeding consumer promises tends to be the most satisfied and most remembered in the interaction and transaction experience created by multiple services in a hospitality setting.

Service quality has gone from being an extra or additional plus to being a central strategic success driver in the business of hospitality. The marketing and strategic positioning of one's product as being entirely distinctive, on the other hand, are as critical as guaranteeing that their service score is greater than that achieved by competing businesses in a highly competitive industry. In fact, service quality is the means for increasing customer retention while it also becomes a competitive differentiator. It builds a competitive advantage and a firm ground of sustainability in the industry, which changes often and rapidly.

Besides the fact that hospitality, in its adaptation to the new global challenges and consumer demand revolution, should bring sustainability to the equation of service quality, the meaning of quality must be extended as part of corporate social responsibility in order to be about possible and ethical things in the natural environment, society, and economy of local communities. This study supposes in essence that the introduction and embedding of green initiatives into service delivery will almost entirely impact environmental effects and operational efficiency enhancements along with client satisfaction.

Actionable recommendations that can be proposed to further solidify the sustainability framework in the hospitality sector: Adopt the concept of a Circular Economy. Hospitality industries have to focus on more waste reduction, resource recycling, and consuming minimum consumption, and always strive to involve a long chain of recycling or utilizing resources in the production cycle on an efficient note, leading to better operating sustainability with lower cost. Form Partnerships. Collaboration with local governments, non-governmental organizations, and recycling organizations must be an essential feature that will lead to setting up integrated and efficient frameworks for incorporating sustainable practices in operations. Partnerships can also get communities involved and amplify the impact of going green.

-Leverage Technology. Engage in investment in high-tech applications, like IoT, AI, and blockchain. It is a game-changing approach to resource management and monitoring: AI-based predictive models optimize energy and water consumption, while blockchain ensures sustainability in the supply chain.

-Engage the Consumer. The most significant cultural aspect to achieve is customer education and ownership when it comes to sustainable practices. Activities include waste sorting campaigns, water-saving programs, and the promotion of domestic eco-friendly products, sometimes carried out by encouraging guest participation in green practices.

-Among various other solutions, collaborating with policymakers to establish and implement clear sustainable guidelines helps remove regulatory gaps and fosters broad embrace of sustainable practices in the industry.

Beyond that, AI together with blockchain has the opportunity to be at the heart of the achievements in sustainability will bring into the hospitality industry. Through artificial intelligence, the resource allocation distribution and operation will be structured in a way that creates less waste and enhances its efficiency. And this is important as far as authentic tracking is concerned because only blockchain is safe and transparent as far as genuine chain policies are concerned.

Hence, by embracing circular economy strategies and encouraging collaboration, technology investment, and consumer engagement, the hospitality sector can be a global leader promotion of responsible tourism. This approach helps in promoting the One-Belt-One-Road philosophy to link habitats where the industry will cause the least damage to the environment but deliver jobs for the people's economic well-being.

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