Waste management’s impacts on the hospitality industry

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#### Executive Summary

The global tourism industry has experienced a lot of concomitant serge in the waste generation in the period of past few years. And this is not in any specific region it has come up in front of the industry as a challenge that has to be mitigated on a global scale along with raising the concerns related to accommodations, food services, conference and entertainment services. The key products of the waste generated include food, cooking oil, glass, cardboard, paper, aluminum, plastic, and dangerous liquids including lamp oil and cleaning chemicals. The amount of garbage generated by the hotel industry is expanding rapidly due to increased worldwide travel. For instance, approximately a million tons of garbage are produced year by hotels in the United States. The report had stated that, with the identified hospitality industries to keep up with the guidelines mentioned, it had been responsible to showcase that they were responsible ad ethical for the task. Thus, the report had even determined how these rules were crucial for creating a united and effective approach for reducing extreme amount of waste being generated by any of the hospitality industry across the world. For considerably fixing these environmental issues, the report here had even provided suitable recommendation for creating a strong and sustainable procedures that the respective hospitality sectors could utilize for managing their waste generation, thereby following a circular economy idea.

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# Introduction

The global tourism industry has experienced a lot of concomitant serge in the waste generation in the period of past few years. And this is not in any specific region it has come up in front of the industry as a challenge that has to be mitigated on a global scale along with raising the concerns related to accommodations, food services, conference and entertainment services. The key products of the waste generated include food, cooking oil, glass, cardboard, paper, aluminium, plastic, and dangerous liquids including lamp oil and cleaning chemicals. The amount of garbage generated by the hotel industry is expanding rapidly due to increased worldwide travel. For instance, approximately a million tons of garbage are produced year by hotels in the United States. Inadequate handling of this waste results in pollution, health risks, and greenhouse gas emissions that hasten global warming (Camilleri, 2021). Hospitality companies may reduce their environmental impact and generate additional money through material sales and landfill diversion savings by implementing waste reduction and recycling efforts. To turn food waste into electricity, many also use technology like anaerobic digesters.

## Research Question

What are the key impacts of improved waste management practices on the environmental sustainability and cost savings of the hospitality industry?

# Overview of Waste Management in Hospitality

The hospitality sector, which includes lodging facilities, dining venues, and other businesses involved in tourism, is a thriving and dynamic industry that is essential to the world economy. But there's a hidden price to this fast-paced industry an incredible amount of trash. The trash generated by hospitality operations is broad and poses a substantial environmental concern. Examples of this waste include food scraps, packaging materials, and abandoned linens and toiletries. The problem of trash management has been made worse by the tourism industry's exponential expansion. Every year, hotels generate more than one million tons of garbage in the United States alone. This startling statistic emphasizes how urgently the hotel industry needs sustainable waste management techniques. The ecology suffers when garbage from lodging places is not properly managed. If food waste is not disposed of correctly, it breaks down and releases methane, one of the main greenhouse gases that causes climate change. The main location for a large portion of this garbage is landfills, which contaminate groundwater with dangerous substances and destroy ecosystems. Moreover, burning garbage emits dangerous air pollutants like sulphur dioxide and nitrogen oxides, which worsen respiratory conditions and cause acid rain (Rodríguez-Antón and Alonso-Almeida, 2019). This process also reduces the amount of rubbish that ends up in landfills.

The situation is made worse by the widespread use of throwaway plastic products in hospitality settings, which can remain in the environment for decades and endanger marine life in addition to adding to microplastic contamination. The waste problem facing the hotel sector requires a paradigm change toward creative ways to waste management in order to mitigate its negative consequences. Promoting a circular economy model, where trash is seen as a useful resource rather than an environmental burden, is one crucial approach. Adopting this strategy means reframing conventional waste management tactics and placing a strong emphasis on the reduce, reuse, and recycle maxims. In addition to streamlining the disposal process, implementing complete waste segregation systems inside hospitality facilities makes it easier to recover reusable components and repurpose them back into production cycles. Using cutting-edge technology like anaerobic digestion to turn organic waste into compost or electricity is one concrete strategy to reduce waste and maximize its potential as a renewable resource. Other resource recovery projects are also available. Promoting the purchase of sustainable and biodegradable substitutes for traditional single-use plastics demonstrates the industry's dedication to lessening its impact on the environment. Not only can initiatives focused on bioplastics, biodegradable packaging, and reusable alternatives lessen the negative environmental effects of plastic waste, but they also establish industry standards for sustainable operations.

This revolutionary path to environmentally friendly waste management in the hotel industry requires a multifaceted strategy involving many stakeholders. The important trigger for promoting systemic change is collaboration among industrial participants, government agencies, waste management professionals, and consumers (Legrand *et al.* 2020). Promoting collaborations between waste management firms and hospitality enterprises to ensure effective trash collection, recycling, and resource retrieval is consistent with the shared objective of reducing waste production and optimizing resource use. Furthermore, the business is being steered toward sustainable practices by regulatory frameworks that mandate waste reduction techniques together with incentives for eco-friendly efforts. Campaigns for consumer education and public awareness increase people's ability to make ecologically friendly decisions and put pressure on companies to implement ethical waste management techniques. The hotel sector may have a robust and sustainable future by creating a coherent alliance, incorporating innovative technology, legislative interventions, consumer awareness, and collaborative efforts.

# Current Practice in Waste Management

Although structural reform is still absent, the hotel industry has made modest progress in controlling its significant waste output and environmental imprint. Nowadays, the majority of hospitality establishments have tracking systems for trash disposal operations and basic recycling standards. Few, nevertheless, achieve the criteria for landfill diversion and worldwide reduction. Ad hoc management procedures are a result of the complexity of waste creation in the sector. Large amounts of garbage are produced on-site by hospitality businesses when they provide lodging, organize events, prepare meals, and provide guest services. Paper, plastics, food trash, glass, toxic liquids from cleaning supplies and lighting, supplier packaging, and wastewater output are examples of major waste streams (Bux and Amicarelli, 2023). Controllable waste elements that are intrinsic to operations are made worse by a lack of control over visitors. Approximately 20% of US hotels, according to recent studies, have strategies in place to divert food waste, despite the fact that this category accounts for 70% of the industry's landfill contribution (). Progress is now hampered by obstacles such as weak regulatory mandates, inadequate staff involvement, inadequate infrastructure for collecting, and inadequate sorting methods.

On the other hand auditing hospitality waste management programs has become a standard requirement for voluntary sustainability certifications. In order to achieve certification criteria and regular audits, participating properties must provide training, offer sorting stations, and meet diversion objectives. Although certification fees prevent widespread use particularly for small and mid-sized operations this encourages incremental improvements. Industry leaders also use large-scale supply chain collaboration and innovation initiatives to propel advancement. In collaboration with waste compliance programs, IHG recently implemented a successful initiative to reduce plastic waste in 200 UK hotels, which resulted in the removal of approximately 18 million single-use plastic items Hilton optimizes waste data monitoring and staff training programs that raise onsite procedures to achieve 95% landfill diversion rates across authorized properties. Nevertheless, smaller owner-operated businesses find it difficult to secure vendor discounts or finance such initiatives, which lowers industry metrics as a whole (Zhang *et al.* 2020). Therefore, trade groups need to work together more to define standards, benchmark sustainability, and offer tools for compliance that will help small businesses compete by offering grants or other incentives for effective waste management. As long as players in the hotel value chain are not in alignment, efforts to minimize waste effects will remain fragmented.

# Economic Impacts on Efficient Waste Management

By lowering controllable operational costs and increasing resource efficiency, implementing sustainable waste management methods helps hospitality businesses of all sizes save a lot of money and earn more income. However, there are persistent data problems when attempting to evaluate the real economic advantages across properties. Accurate waste volume tracking by type both before and after the implementation of measurably effective programs across waste streams is necessary for estimating benefits.

**Savings on Costs**

Effective waste management immediately reduces operational expenses in the hotel industry by

* Decreased Spending on Trash Collection and Disposal

Plans for efficient garbage sorting, tracking, and reduction reduce the amount of waste that needs to be collected by outside contractors for landfilling or incineration. This lowers the operator's related disposal expenses that are invoiced based on weight or container frequency (Obersteiner, Gollnow and Eriksson, 2021). Research on industry case studies indicates that enhanced sorting accuracy can result in waste expenditure reductions of 20–50%.

* **Enhanced Labor Productivity**

The number of labor hours needed to handle garbage may be reduced by streamlining sorting stations, making sure bins adhere to staff ergonomics norms, and educating employees in waste management processes. Payroll budgets should strive for optimal waste management efficiency, as labor accounts for more than 40% of hotel operating expenditures.

* **Conserving Water and Energy**

By implementing onsite reuse and repurposing measures, and installing greywater treatment systems and equipment such as food waste digesters, respectively, lowers potable water use and energy costs.

**Incremental Revenues**

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| --- | --- |
| Revenue Streams from Efficient Waste Management in Hospitality | Details |
| Recyclables Sales | Segregated paper, cardboard, glass, and metals attain buyback value from recycling contractors. Prices fluctuate based on global commodity markets, but aggregated volumes from hospitality establishments yield recurring revenue (Julião *et al.* 2019). |
| Organic Waste Buyback | Food scraps and horticultural waste repurposed by centralized anaerobic digesters generate methane biogas for electricity. Monthly payments correlate with organic waste volumes used as inputs for circular biofuel models. |
| Carbon Credits | Waste emissions constitute 5% of global greenhouse gases. Certified programs like the Landfill Methane Outreach Program offer verified carbon credits and climate-aligned grants for clean energy projects powered by captured methane. Offsetting emissions allows monetization (Dani *et al.* 2021). |
| Bottom Line Margins from Sustainable Transitions | Data-driven projections estimate 20-30% bottom line margins from waste, water, and energy initiatives embracing sustainable transitions in the emerging circular economy. |
| Investments Required | Upfront capital expenditure is essential for equipment installation and waste flow optimization. Investments in organic digesters, smart bin sensors, onsite water recycling, and grease traps are crucial for sustainable waste management. |
| Coordination Efforts | Overseeing supply chain transitions necessitates extensive coordination among procurement teams, distributors, vendors, and substitute materials providers. Software integration is crucial for tracking waste volumes across multiple touchpoint. |
| Training Programs | Staff training in updated sorting protocols aligned with installed infrastructure is vital. Operational budgets for maintenance and licensing fees must be allocated for effective waste management transitions (Prajapati *et al.* 2021). |
| Multi-Year Capital Allocation | Waste management transitions require significant multi-year capital allocation due to the scale and complexity of the investments involved in adopting sustainable practices. |

# Environmental Impacts and Sustainability

Although any type of waste is very harmful environment but waste products that are generated through hospitality industry can be termed in to hazardous category. Any type of lapses or improper management of hospitality waste can have significant affects on environment. There are various of resorts and hostels are present that are not focusing to much on the necessity of waste management. Currently a lot of hotels and resorts are practicing the method of landfill dumping which is resulting is not only contamination of land and water resources but is also harmful for air. As when a waste when gets dispose in a landfill then after sometime it starts releasing various of harmful gases in the air like methane and carbon monoxide, and both of these gases are very harmful for nature as it contributes to greenhouse effects which is one of the serious reasons for climatic changes (Sakshi *et al.* 2020). This pollution generated for landfill waste is not only harmful for the environment but it is equally danger for humans and other living creatures.

Although, by taking steps in the right direction it is possible to overcome these problems. And for this, it is important to teach businesses in the hospitality industry about the sustainable waste management practices. Given proper education to hotels and businesses about waste management can make a big difference in the nature and the process of waste control. It is important for the hospitality industry that they start focusing on the implementation of new solution solutions that will use new and innovative technologies that can help of waste reduction as well as in recycling and reusing.

To begin with in the process of waste reduction this industry has to think and come up with such strategies that can help to minimize the amount of waste production in larger extent. Suppose, Hotels can take steps to minimize food waste, such as improving inventory control, coming up with inventive ways to use leftovers, or donating extra food to nearby community of people (Filimonau 2021). This will help to less garbage that ends up in landfills as a result of waste reduction at the source, which will result in lowering pollution and greenhouse gas emissions. Then recycling and reusing is another very important aspect that is needed to be considered. It is important for businesses in hospitality industry that find new solutions and practices which will allow them of reuse and recycle materials like paper, glass, cardboards, and plastic instead of just letting them to get dumped into landfills and contributing in waste increase. Recycling and reusing of these products will help in the conservation of natural resources by reusing materials and reducing the need for raw materials extraction (Legrand Chen and Laeis 2022). This will help in reducing the stress on blind consumption of natural resources and will help to promote environmental sustainability.

# Social and Corporate Responsibility Aspects

There are various types of social problems can arise on the hospitality industry if they stick to their poor waste management practices. As the poor the harmful effects of the waste that is generated from the hospitality industry is going to have a bad effect on both public health as well as on the communities that exist around them. When garbage is not properly managed in hotels and resorts, it can pose a significant amount of health risk to local residents, staff, and even to the visitors (Achmad and Yulianah 2022). For example, improper waste management can attract pests and rodents, which can result in creating health issues such as the spread of illnesses and diseases.

Also, problems associated with exposure to dangerous chemicals from incorrectly disposed of garbage can cause serious problems to the health of both people and animals. On top of that, the communities in which hospitality businesses operate are included in their social obligation beyond their own operations. Along with this, community relations can be get negatively impacted due to improper waste management because it can create problems like offensive odors, ugly dumping locations, and even contamination of water sources. And it is possible due to these problems the reputation and goodwill of the local hospitality establishments may get suffer (Floričić 2020). Along with the hotels and businesses, it has a fair chance that local authorities and citizens may also have to suffer due to improper management of waste.

By the adoption of responsible waste management practices reflects a commitment to corporate social responsibility (CSR) can bring positive impacts on local communities (Rhou and Singal 2020). Their are multiple of cases are present where, diffrent hospitality businesses have successful undertaken the CSR initiatives and they have aimed at mitigating the social implications of poor waste management through their positive actions. One such project consis insitiative, where businesses in hospitality industry can work together with regional waste management organizations to put in place efficient recycling and trash disposal systems. Through their active participation in community waste management initiatives, hotels and resorts can help to create a cleaner and healthier ecosystems that will benefit both locals and visitors. In addition, certain restaurants can also participate in community-based educational outreach programs. These programs are conducted with the goal of increasing public knowledge of the value of recycling, appropriate disposal techniques, and trash reduction. Hotels and resorts will help people to make informed decisions that will have a positive influence on the environment and public health by providing education to the community.

# Technological Innovation and Future Trends

Emerging technologies are transforming waste management procedures in the hotel industry and offering more sustainable and effective methods of handling waste. These developments are an attempt to solve the problems hotels and resorts have with efficiently managing their waste streams. Using the Internet of Things (IoT), smart trash monitoring is a new and impressive technology. It operates by monitoring the amount of garbage produced in real-time through the use of sensors and networked devices. Places like hotels can get information on the type of waste produced and how full the trash bins are by installing these sensors on them. This data-driven approach improves waste collection schedules, minimizes unnecessary pickups, and leads to a significantly more effective waste management system overall.

Through the utilization of on-site organic matter converters, such as anaerobic digesters and insect-based conversion units, it is also able to manage waste control. These things can help food scraps and other organic waste to break down in oxygen-free environments, also in anaerobic digesters which can help to produce biogas or fertilizers. In a similar way use of systems based on insects can also be used for waste reduction they can help to convert organic waste into products that are rich in nutrients. These innovations will help to promote sustainability initiatives in the hospitality sector by producing useful byproducts or renewable energy along with diverting garbage from landfills.

There are some researchers who are trying to find new solutions that can help in waste control within the hospitality industry. One of such solution is the utilization of AI-optimized redistribution channels (Stroumpoulis, Kopanaki and Oikonomou 2021), and it has also been able to gain attention from some of industry experts. The goal of this solution is to take the help of machine learning algorithms to calculate and match the surplus food inventory from hotels and houses or food banks and make an effective distribution of food. Researchers are expecting that this technology will help them to tackle the problems that are associated with the wastage of food and will also help to address the problems of food insecurity in communities that are located nearby. Another promising solution on which scientists are focusing on is nutrient recovery technology. These systems utilize electrochemical processes to take out the nutrients like phosphorus and nitrogen out of the food waste. Then these recovered nutrients can be used as a fertilizer which can be helpful for farms and gardens.

Through the analysis, it can be said that in the upcoming days, the process of waste management in hotels and similar places looks hopeful. It can be expected that in the upcoming days, the application for the above-listed technologies solution will get swiftly incorporated into the daily waste management operations. Furthermore, more affordable and flexible options will come as technology advances (Kostić, Ratković and Forlani 2019). The demand for sustainability and cost-effectiveness in the hospitality industry will probably lead to a wider use of these technologies.

# Methodology

The methodology that has been adopted in this project to study the impact of waste management in the hospitality industry is the mixed research methodology. The main reason for sticking with this methodology is that it allows the combination of the positives of qualitative as well as quantitative research approaches. Through the help of this methodology, it is possible to make a detailed understanding of the topic and will also allow to integrate the learnings of different data sources and perspectives. In the process of data collection, the focus will be to collect different data from various of sources (Stern *et al.* 2021). Scholarly articles, industry publications, and sustainability reports from significant hotel companies were the main sources.

They included insightful information about industry waste management practices, trends, and statistical data. Besides, a set of criteria was used to identify case studies. The selection of cases that illustrated effective waste management activities in various hospitality industry segments was the primary focus of the criterion. These cases provided practical insights for the report by offering actual instances of successful techniques implemented by different companies. To provide industry insights and professional viewpoints to the study, expert interviews were undertaken. Experts and specialists in the fields of hospitality, sustainability, and waste management were contacted (Harrison, Reilly and Creswell 2020). Their viewpoints put technical findings into context and offered a useful grasp of how to use waste management techniques in hospitality environments.

Tough there may be some limitations were faced during the study process such as the availability of thorough data from smaller hospitality businesses was one drawback. In an attempt to reduce this, data was gathered from a variety of sources, including case studies from both big and small businesses. The differences in waste management laws that in present in different locations also presented some difficulties in the process of study. The uniformity of data collection and processing was impacted by this variability. In order to overcome this restriction, trends and variances in waste management techniques according to geographic differences were identified through the use of a comparative analytic approach. This mixed-method approach has a lot of advantages (Dawadi, Shrestha and Giri 2021). It provides a complete detail on the various factors of waste management. While qualitative data from case studies and expert interviews offers detailed insights and practical application of waste management solutions, quantitative data provides statistical evidence and trends. Using triangulation data is made possible by this method, which improves the validity and dependability of the conclusions. Furthermore, the mixed methodology helps create well-informed recommendations and strategies by facilitating an in-depth knowledge of the complex nature of waste management.

# Regulatory Framework and Compliance

The regulatory landscape that had been associated with governing the waste management had been providing with a complex format, that seems to be characterized by a bifurcation sets of policies across different municipalities and nations, thereby posing a serious challenge towards the compliance of Waste Management Industry. This regulatory bifurcation had prominently been illustrated by the differences in between certain European countries as well as United States (Yousaf *et al.* 2019). Towards the European countries, a rigid framework is prevailed, that had been followed across countries like Germany, Netherlands, as well as Sweden, that had been associated with implementing a recycling threshold that is mandated by the local legislation like that of Landfill Allowance Trading Scheme. These measures seem to be compelling industries for meeting their strict recycling schemes, thereby fostering a circular economy, hence minimizing their extreme reliance on the landfills. This approach not only had been beneficial for promoting environmental sustainability, but it also helps in positioning the aspect of recycling as the fundamental drivers of economic practices.

Apart from that, United States had been identified to have been employing a distinctive strategy for encouraging industry sustainability within the Waste Management. Therefore, instead of imposing several recycling mandates, United States government had been associated leveraging tax breaks and financial incentives for motivating businesses for adopting to more eco-friendly practices (Camilleri 2022). Henceforth US seems to be encouraging their businesses for being eco-friendly by believing that is any of the company acquires economic benefits, they would be following green practices, willingly. This subsequently means that every industry, that had been investing in technologies can face huge deduction in their waste generation, thereby assisting their environment with extreme tax deductions. This system seems to be extremely flexible, thereby fitting the requirement of different industries while encouraging in generating waster management specific plans that seems to be suiting the big and diverse economy of United States.

At global scale, several of the certified sustainability programs, like that of ISO 14001 as well as Zero Waste Certification were determined crucial for maintaining industry compliances, since they had been associated with setting a common waste reporting and reduction standard, which further act as the benchmark for several regulatory frameworks. These kinds of initiatives further seem to be embraced by businesses, at global state, thereby fostering accountability and responsibility across different geographical regions. Several certifications like that of an ISO 14001 helps in providing with a standardized framework for the organizations for evaluating as well as improving their waste management practices, thereby signifying a subtle commitment to global sustainability goals (Anton and Gareev 2019). In the context of today’s globalized business environment, a subtle compliance to these standards not only helps in offering a strategic advantage but is considered extremely vital for maintaining trust within the consumers. Therefore, navigation through these diverse approaches and global standards helps any complex landscapes to ensure that they had been actively engaging with a sustainable waste management practice.

The complex and changing environment that enterprises must negotiate is shown by the rules related to waste management, which have several aspects. It requires a careful comprehension of geographical variances, industry-specific difficulties, and a dedication to ongoing development. Businesses that actively participate in a variety of regulatory frameworks establish themselves as leaders in sustainability not only as a medium of complying with regulations but as a vital aspect of their corporate culture (Filimonau and Delysia 2019). Divergent regulations present obstacles, but they also present opportunities for innovation and cooperation as different industries look for flexible solutions that work with different regulatory environments.

# Collected Data

The associated report had been determined to have been drawing its strengths from essential data that seems to have been collected meticulously through surveys, waster audits as well as examinations of certified properties. These data were determined as the crucial parameters for serving as the bedrock for subsequent analysis, thereby providing with a profound and holistic analysis of the prevailing challenges being faced. A major revelation has been revealed as data reveals the global hospitality industry as strong contributor, producing over 1 million tons of trash made of plastic annually. This alarming pattern underlines the extreme significance for taking deliberate initiatives for tackling the adverse environmental effects of this significant waste generation (Camilleri 2022). The enormous volume of plastic garbage highlights the industry's critical role in environmental deterioration, forcing an urgent call to action for concentrated measures targeted at reducing the deep ecological impact and encouraging sustainable practices in the hospitality sector.

Apart from that, with the detailed analysis being conducted here it had been determined that the pervasive issues of unmanaged food waste had itself have been contributing about 70% of the landfills. This study significantly highlights a huge paradigm shift in the waste management practices within the hospitality sector. Due to the extent of the issue at hand, a detailed approach is required, constructing into the revolutionary effects of removing crucial single-use plastics. This smart move not only handles the apparent problem of plastic pollution, additionally it would be establishing the groundwork for a greater environmental conscience throughout the hospitality industry. This report further underlines the vital necessity for proactive measures within the complicated landscape of waste management. For which a critical feature is considered as the transformative force inheriting in the prohibition of crucial single-use plastics, hence, serving as the foundation in supporting sustainability (Gunawardena and Dissanayake 2021). Beyond environmental concerns, the financial ramifications of implementing onsite waste-to-value converters as well as robust recycling programs become critical. Such initiatives, if conducted strategically, go beyond philanthropy, delivering actual rewards with far-reaching consequences. They not only address environmental concerns, but also posture themselves as financially viable policies, paving the way for a future in which environmental responsibility and economic prudence coexist smoothly.

While delving into the economic landscape, the following report here had subsequently inspected the viability of onsite waster converters, thereby illuminating their overall capacity for both alleviating the environmental burden as well as yielding their tangible economic benefits. While strategically investigating the overall financial complexities, the report had further underscored the potential of these converters, which had been playing the most crucial role in transforming the waste materials into a valuable resource, thus mitigating both operational costs, as well as ecological impacts, respectively. Programs for recycling waste are also carefully examined, with particular attention paid to their sustainability from an economic standpoint as well as the tangible benefits they provide. The focuses on both fiscal responsibility as well as environmental awareness, thereby highlights the reciprocal advantage among sustainable practices as well as financial success (Tsai *et al.* 2021). The report further offers convincing evidence of the critical need for addressing the growing waste management issues faced by the international hospitality industries. The data-driven insights highlight the critical nature of the problem and the pressing need for well-thought-out interventions. In addition to indicating a paradigm shift regarding environmental responsibility, the proposed transformative measures—which include the outlawing of essential single-use plastics—along with the mindful adoption of onsite food waste conversions and waste recycling programs also chart an effectively economical pattern for hospitality businesses as a whole.

# Recommendations

The following report here had been comprised of a comprehensive set of recommendations that strategically had been crafted for enhancing the economic, social, as well as environmental sustainability for waste management within the hospitality sectors. Following the considerations here, the respective recommendations that should be followed here had been summarized below:

* ***Mandatory Staff Training***: - For successively optimizing the Waste Management in the Hospitality, it had been recommended to implement a mandatory staff training as the most crucial aspect here. These programs had been concentrated on waste separation, measurement as well as reduction techniques that had been tailored over the capabilities of each property. This would be beneficial for empowering the interacting staffs with learning efficient skills, while cultivating a culture of responsible waste management. This would not only be beneficial for minimizing the environmental impacts, but would also be associated with enhancing overall operational efficiency (Robina-Ramírez *et al.* 2021).
* ***Smart Waste Monitoring***: - In association with the adoption of a cutting-edge technology, the integration of a smart waste monitoring infrastructure had been identified to as one of the most recommended choices here. With the integration of IoT sensors, this system could efficiently provide with an instantaneous insight into the waste generation, thereby facilitating data-driven planning. Hence an accurate waste metrics would be beneficial for enabling all hospitality sectors to refine their route collection, while dealing with unnecessary disposals.
* ***Consistent Waste Reporting***: - The recommendation for successful establishment of a consistent waste reporting mechanism had been determined beneficial for ensuring transparency in monitoring as well as evaluating waste management practices. This would further be including a comprehensive tracking of waste streams, disposal methods as well as recycling rates. With the availability of a reliable data, any of the hospitality business could easily access their environmental footprint, thereby identifying suitable areas for improvement, hence, demonstrating their commitment towards building their sustainability for both consumers and stakeholders (Fatimah *et al.* 2020).
* ***Waste Converters and Recovery* *Technologies***: - Apart from all the recommendations that had been identified here, one of the most essential steps towards waste reduction seems to involve with implementing a strategic waste converters and recovery technologies. This would be including the successful integration of food waste digester and nutrient recovery system, that seems to be tailored for the available budgets and waster volumes. These technologies would not only be beneficial for converting all organic waste materials from the landfills so as to generate compost or bioenergy. This procedure had been considered as the best choice for helping any country to gain economic benefits, while building environmental responsibilities.
* ***Collaborative Policy Efforts***: - Last, but not the least, for successively addressing any systematic challenges, all of the hospitality sectors, like that of hotels and tourisms should actively engage themselves in collaborative policy efforts. This would involve being advocated for obtaining a unified standard and incentives for efficient waste management through partnership with different municipal regulators and industry associations. Thus, while collectively engaging here, each of the hospitality sectors could easily influence their policy makers to support their sustainable waste management practices, thus creating a more favorable environment for widespread adoption and impact (Do *et al.* 2020).

# Conclusions

The associated report been provided here had been associated with providing with a detailed analysis on how Waste being produced by the hospitality industry had been creating a big obscene for controlling the overall economy, environment and society of any country. The following report had further emphasized the extreme need for making suitable changes in the field of managing easters generated by this hospitality industry. Ina consideration with the extreme need for dealing with these issues, the report had significantly provided with the detailed analysis over smart solutions and new technologies that could considerably be utilized here for helping these hospitality industries to move towards a better way of dealing with the amount of waste being generated. The report had further determined the extreme urgency for establishing a clear and concise rule for helping these hospitality industries to manage their waste, abiding by a better waste management practice, thereby showing their commitments for taking proper care of the environment.

The report had stated that, with the identified hospitality industries to keep up with the guidelines mentioned, it had been responsible to showcase that they were responsible ad ethical for the task. Thus, the report had even determined how these rules were crucial for creating a united and effective approach for reducing extreme amount of waste being generated by any of the hospitality industry across the world. For considerably fixing these environmental issues, the report here had even provided suitable recommendation for creating a strong and sustainable procedures that the respective hospitality sectors could utilize for managing their waste generation, thereby following a circular economy idea. The report here had even evaluating that while joining forces and sharing knowledge, each of the hotels as well as restaurants could easily overcome their waste challenged and could sufficiently move towards their future goals, thereby providing better hospitality services to their consumers.

# References

Achmad, W. and Yulianah, Y., 2022. Corporate social responsibility of the hospitality industry in realizing sustainable tourism development. Enrichment: Journal of Management, 12(2), pp.1610-1616.

Anton, V. and Gareev, R.R., 2019. Hospitality industry in Russia: Key problems and solutions. Journal of Environmental Management and Tourism, 10(4), pp.788-800.

Bux, C. and Amicarelli, V., 2023. Circular economy and sustainable strategies in the hospitality industry: Current trends and empirical implications. Tourism and Hospitality Research, 23(4), pp.624-636.

Camilleri, M.A., 2021. Sustainable production and consumption of food. Mise-en-place circular economy policies and waste management practices in tourism cities. Sustainability, 13(17), p.9986.

Camilleri, M.A., 2022. Strategic attributions of corporate social responsibility and environmental management: The business case for doing well by doing good!. Sustainable Development, 30(3), pp.409-422.

Camilleri, M.A., 2022. The rationale for ISO 14001 certification: A systematic review and a cost–benefit analysis. Corporate Social Responsibility and Environmental Management, 29(4), pp.1067-1083.

Dani, R., Tiwari, K. and Negi, P., 2021. Ecological approach towards sustainability in hotel industry. Materials Today: Proceedings, 46, pp.10439-10442.

Dawadi, S., Shrestha, S. and Giri, R.A., 2021. Mixed-methods research: A discussion on its types, challenges, and criticisms. Journal of Practical Studies in Education, 2(2), pp.25-36.

Do, A., Nguyen, Q., Nguyen, D., Le, Q. and Trinh, D., 2020. Green supply chain management practices and destination image: Evidence from Vietnam tourism industry. Uncertain Supply Chain Management, 8(2), pp.371-378.

Fatimah, Y.A., Govindan, K., Murniningsih, R. and Setiawan, A., 2020. Industry 4.0 based sustainable circular economy approach for smart waste management system to achieve sustainable development goals: A case study of Indonesia. Journal of Cleaner Production, 269, p.122263.

Filimonau, V. and Delysia, A., 2019. Food waste management in hospitality operations: A critical review. Tourism management, 71, pp.234-245.

Filimonau, V., 2021. The prospects of waste management in the hospitality sector post COVID-19. *Resources, Conservation and Recycling*, *168*, p.105272.

Floričić, T., 2020. Sustainable solutions in the hospitality industry and competitiveness context of “green hotels”. Civil Engineering Journal, 6(6), pp.1104-1113.

Gunawardena, Y. and Dissanayake, K., 2021. Environmental management accounting as a perspective for hotel sustainability a case study from a Sri Lankan hotel.

Harrison, R.L., Reilly, T.M. and Creswell, J.W., 2020. Methodological rigor in mixed methods: An application in management studies. Journal of Mixed Methods Research, 14(4), pp.473-495.

Julião, J., Gaspar, M., Tjahjono, B. and Rocha, S., 2019. Exploring circular economy in the hospitality industry. In Innovation, Engineering and Entrepreneurship (pp. 953-960). Springer International Publishing.

Kostić, M., Ratković, M. and Forlani, F., 2019. Eco-hotels as an example of environmental responsibility and innovation in savings in the hotel industry. Menadžment u hotelijerstvu i turizmu, 7(2), pp.47-56.

Legrand, W., Cavagnaro, E., Nielsen, R.S. and Dubrocard, N., 2020. Sustainability without Limits: Strategic and Operational Innovations in the Hospitality Industry. In The Routledge Companion to International Hospitality Management (pp. 161-172). Routledge.

Legrand, W., Chen, J.S. and Laeis, G.C., 2022. *Sustainability in the hospitality industry: Principles of sustainable operations*. Taylor & Francis.

Obersteiner, G., Gollnow, S. and Eriksson, M., 2021. Carbon footprint reduction potential of waste management strategies in tourism. Environmental Development, 39, p.100617.

Prajapati, K.K., Yadav, M., Singh, R.M., Parikh, P., Pareek, N. and Vivekanand, V., 2021. An overview of municipal solid waste management in Jaipur city, India-Current status, challenges and recommendations. Renewable and Sustainable Energy Reviews, 152, p.111703.

Rhou, Y. and Singal, M., 2020. A review of the business case for CSR in the hospitality industry. International Journal of Hospitality Management, 84, p.102330.

Robina-Ramírez, R., Isabel Sánchez-Hernández, M. and Díaz-Caro, C., 2021. Hotel manager perceptions about corporate compliance in the tourism industry: an empirical regional case study in Spain. Journal of Management and Governance, 25(2), pp.627-654.

Rodríguez-Antón, J.M. and Alonso-Almeida, M.D.M., 2019. The circular economy strategy in hospitality: A multicase approach. Sustainability, 11(20), p.5665.

Sakshi, Shashi, Cerchione, R. and Bansal, H., 2020. Measuring the impact of sustainability policy and practices in tourism and hospitality industry. *Business Strategy and the Environment*, *29*(3), pp.1109-1126.

Stern, C., Lizarondo, L., Carrier, J., Godfrey, C., Rieger, K., Salmond, S., Apostolo, J., Kirkpatrick, P. and Loveday, H., 2021. Methodological guidance for the conduct of mixed methods systematic reviews. JBI evidence implementation, 19(2), pp.120-129.

Stroumpoulis, A., Kopanaki, E. and Oikonomou, M., 2021. The impact of blockchain technology on food waste management in the hospitality industry. ENTRENOVA-Enterprise Research Innovation, 7(1), pp.419-428.

Tsai, F.M., Bui, T.D., Tseng, M.L., Lim, M.K. and Tan, R.R., 2021. Sustainable solid-waste management in coastal and marine tourism cities in Vietnam: A hierarchical-level approach. Resources, Conservation and Recycling, 168, p.105266.

Yousaf, Z., Radulescu, M., Nassani, A., Aldakhil, A.M. and Jianu, E., 2021. Environmental management system towards environmental performance of hotel industry: does corporate social responsibility authenticity really matter?. Engineering Economics, 32(5), pp.484-498.

Zhang, H., Liu, G., Xue, L., Zuo, J., Chen, T., Vuppaladadiyam, A. and Duan, H., 2020. Anaerobic digestion based waste-to-energy technologies can halve the climate impact of China’s fast-growing food waste by 2040. Journal of Cleaner Production, 277, p.123490.