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The Impact of Tourism Pollution and Entrepreneurs' Role to Finding Sustainable Waste Management Solutions in Kuta, Seminyak, and Ubud

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Abstract: The rapid growth of tourism in Bali, one of the world's leading tourist destinations, has contributed to an escalating waste management crisis. This research aims to assess the impact of tourism-related waste generation in Kuta, Seminyak, and Ubud and evaluate the effectiveness of existing waste management policies. This study employs a qualitative research approach, focusing on waste distribution patterns and the tourism sector's contribution to plastic waste. The participants in the study include waste management authorities, tourism-related businesses, and local communities. Data were collected through interviews and field observations to identify key sources of waste and evaluate policy implementation. Data analysis was conducted using thematic analysis to identify recurring issues and challenges. The results indicate that tourism-related businesses, particularly luxury resorts and restaurants, generate over 60% of Bali's plastic waste. Despite efforts such as the 2019 plastic ban, weak enforcement, inadequate infrastructure, and inefficient waste disposal systems continue to cause pollution and landfill overflow. The study highlights critical gaps in waste collection, recycling facilities, and policy enforcement. It suggests that tech-driven waste collection services, large-scale recycling plants, and sustainable product alternatives could offer viable solutions. Additionally, implementing sustainability-focused education programs and community-based initiatives is essential for long-term waste reduction. The research implies that stricter policy enforcement, infrastructure investment, and enhanced collaboration between the government, businesses, and local communities are necessary. Future research should focus on the feasibility of waste-to-energy projects and the impact of sustainable tourism practices on waste management.

Keywords: entrepreneurs' role, tourism pollution, sustainable, waste management.

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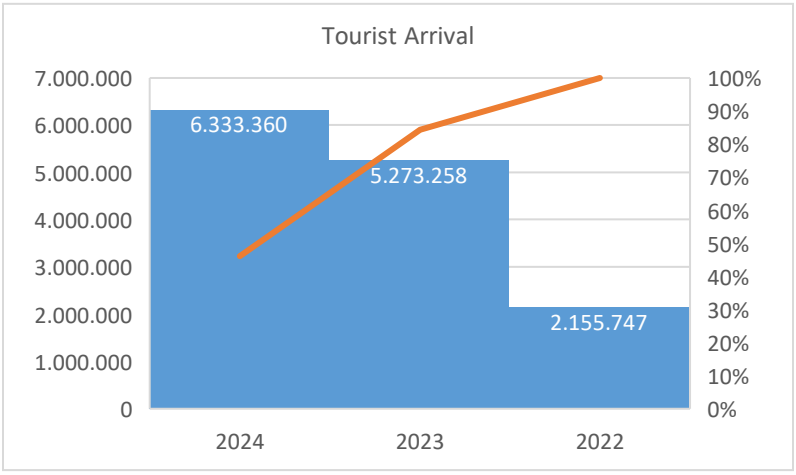
Introduction

Tourism in Bali represents a paradox; while it strengthens economic resilience and global recognition, it also exposes the island to structural vulnerabilities, particularly for marginalized groups such as women in the tourism workforce. Each year, millions of global visitors are drawn to Bali for its natural beauty, cultural richness, and welcoming local communities. Bali's thriving tourism sector has fostered a dynamic hospitality industry, offering accommodations that range from budget-friendly guesthouses to world-class luxury resorts and private villas. The island is also known for its vibrant culinary scene, featuring traditional Balinese cuisine and international gourmet dining experiences. Bali faces over-tourism, environmental sustainability, and waste management challenges despite its popularity. Efforts are being made to promote responsible tourism practices, such as eco-friendly resorts, sustainable waste

management initiatives, and community-based projects empowering local communities while preserving the island's natural and cultural heritage (Mentansan et al., 2023).

According to the latest data from the Bali Province Central Bureau of Statistics (Bali Province Central Bureau of Statistics (BPS: Badan Pusat Statistik), 2024); in 2024, international tourist arrivals to Bali reached 6,333,360, marking a 20.1% increase from the 5,273,258 recorded in 2023. This surge was particularly prominent during the peak travel seasons of July and December. In December 2024, the number of international arrivals reached 551,100, reflecting a 16.54% increase from November 2024.



(Source: Bali Province Central Bureau of Statistics (BPS: Badan Pusat Statistik))

Figure 1. International Tourist Arrival in Bali 2022-2024

Among these visitors, Australia remained the leading source country, followed by India and South Korea. The Bali provincial government has set a target of 6.5 million international arrivals for 2025. While this growth significantly benefits the local economy through tourism, it also presents substantial challenges, particularly in waste management. The rising number of tourists has led to an exponential increase in waste production, particularly plastic and food waste, which, if inadequately managed, poses serious risks to Bali's environment and ecosystem (Rudyana & Rijal, 2022).

The correlation between increasing tourist arrivals and the rising volume of waste management is undeniable. According to reports from the Bali Regional Environmental Agency, Bali generates approximately 3.5 million tons of waste annually, with around 1,300 tons produced daily during peak tourist seasons (Urmila et al., 2023). A significant portion of this waste consists of plastic materials, which, if not properly managed, can lead to severe environmental degradation. The accumulation of waste contributes to pollution on both land and water bodies, posing a serious threat to Bali's pristine landscapes and fragile marine ecosystems. In this context, effective waste management is not merely an environmental concern but also a critical factor in preserving Bali's reputation as a world-class travel destination and ensuring the well-being of its local communities (Sari et al., 2023).

Waste management is crucial in advancing the United Nations Sustainable Development Goals (SDGs), particularly goals 3 through 17. In tourism-dependent regions such as Bali, improper waste disposal accelerates environmental degradation, contaminating water and soil while reducing land usability and aesthetic value. Despite Bali's global image as a paradise destination, its waste management infrastructure reveals inefficiencies, particularly in stakeholder coordination (Sujawoto et al., 2023). While high-end hotels and luxury resorts continue to generate significant amounts of

non-biodegradable waste, local communities often lack the necessary resources and knowledge to dispose of such materials properly. Consequently, a large proportion of waste is in illegal dumpsites, worsening pollution levels and creating long-term sustainability challenges. This issue exemplifies the broader pattern of unsustainable tourism, often worsened by inconsistent government oversight and inadequate policy enforcement. Addressing these challenges requires a holistic and collaborative approach, balancing economic gains with environmental responsibility to ensure the long-term sustainability of Bali's tourism sector (Utama et al., 2023).

Recognizing the urgency of sustainable waste management, the Balinese government and local communities have initiated various measures, including waste segregation at the source, recycling education programs, and environmental cleanup campaigns (Widiana et al., 2022). While these efforts have yielded some progress, significant challenges remain. This presents a unique opportunity for entrepreneurs with diverse backgrounds and expertise in innovative waste management practices. Their active participation can contribute to the resolution of Bali's waste crisis while unlocking lucrative business opportunities in the environmental sector.

Despite numerous initiatives ranging from recycling businesses to community-based education and large-scale cleanup programs, Bali continues to face an escalating waste crisis that threatens both its environmental sustainability and its long-term viability as a global tourism destination. Existing efforts remain largely fragmented, small in scale, and insufficiently integrated into the wider tourism economy, thereby limiting their capacity to address underlying structural challenges. This gap underscores the urgent need for more comprehensive and innovative approaches that not only alleviate environmental pressures but also create socio-economic opportunities for local communities. Accordingly, this study seeks to address the following research question: In what ways can entrepreneurial initiatives, community education, and participatory environmental programs be systematically integrated into Bali’s tourism sector to establish sustainable waste management models that balance economic growth with ecological responsibility?

Methodology

This study employs a qualitative research design to examine the distribution and impact of waste generated by the tourism sector in Bali. Tourism in Bali contributes significantly to waste production, with approximately 1,300 tons of waste produced daily during peak seasons. The main objective is to provide a detailed analysis of waste management challenges and explore potential solutions that align with sustainability goals.

Primary data were collected through semi-structured interviews with key informants, including hotel and restaurant managers, local entrepreneurs involved in recycling initiatives, government officials from the Bali Environmental Agency, and community leaders engaged in waste management programs. These participants were selected using purposeful sampling because of their direct involvement in tourism-related waste issues. Their diverse professional backgrounds ensured that the study captured multiple perspectives on waste generation, management practices, and sustainability challenges. To complement primary data, secondary sources, such as peer-reviewed journal articles, government policy documents, environmental agency reports, and statistical data from the Bali Province Central Bureau of Statistics (BPS), were analyzed. Only sources published within the last five years were included to ensure relevance and accuracy.

Interview transcripts and secondary data were analyzed thematically through a three-stage process. The first stage involved coding, where key phrases and ideas related to waste generation, management practices, and sustainability were identified. The second stage focused on categorization, in which the initial codes were organized into broader themes, such as systemic barriers, entrepreneurial opportunities, and policy effectiveness. Finally, the stage of interpretation linked these themes with the chosen theoretical frameworks to explain recurring patterns, contradictions, and gaps across the data. This structured process provided a comprehensive and nuanced understanding of the behavioral and systemic factors influencing waste management in Bali's tourism sector.

The study draws upon two key theoretical perspectives. First, Parsons's Systems Theory (2001) is used to analyze how different actors, businesses, communities, and government institutions interact within Bali's waste management system (Chotim, 2022). Second, Creswell's Qualitative Inquiry Framework (2018) guides the methodological choices, particularly the emphasis on purposive sampling, open-ended interviews, and interpretive analysis. Together, these theories provide a foundation for understanding systemic interactions and capturing the lived experiences of stakeholders (Creswell & Poth, 2018).

To strengthen the credibility of this study, the research included a diverse group of informants representing different sectors directly involved in tourism-related waste management. Purposive sampling was employed to ensure that participants provided relevant and informed perspectives, including hotel managers, local entrepreneurs, community leaders, government officials, and NGO representatives. To protect confidentiality, each informant has been assigned a code (R1–R5), and their affiliations are presented in generalized terms. The demographic profile of the informants is summarized in Table 1.

Table 1. Demographic Informants

Code	Position/Role	Sector/Organization	Years of Experience	Relevance to Waste Management in Tourism
R1	Manager	Hotel (3-star)	12	Oversees hotel waste disposal practices and compliance with local regulations
R2	Entrepreneur	Recycling business	8	Runs a plastic upcycling initiative producing eco-friendly souvenirs
R3	Community Leader	Local village (desa adat)	15	Coordinates community-based waste segregation and cleanup events
R4	Government Official	Environmental Agency	10	Involved in drafting and monitoring waste management policies
R5	NGO Representative	Environmental NGO	7	Designs educational programs on waste segregation for tourists and residents

(Source: Primary Data, Researcher, 2025)

Results and discussions

Results

The literature on waste management in Bali, particularly regarding the tourism sector and its influence on dumpsite areas, highlights significant challenges and potential strategies for improvement. The following synthesis examines the key findings from various studies on this issue. Several specific case studies highlight the waste management challenges and solutions in different regions of Bali. In Nusa Penida District, research found that high tourist activity contributes significantly to waste generation, with an average of 15.90 tons of waste produced daily.

Table 2. Classification of Waste in Bali's Tourism Sector

Waste Type	Examples	Main Sources	Environmental Impact
Plastic	Bottles, bags, straws	Hotels, restaurants, tourists	Non-biodegradable marine pollution
Organic	Food scraps, garden waste	Restaurants, hotels, households	Produces methane if unmanaged, but compostable
Paper	Brochures, packaging, napkins	Tourism businesses, events	Biodegradable, contributes to landfill volume
Glass/Metal	Bottles, cans, packaging	Bars, restaurants, resorts	Recyclable but often improperly disposed of
Hazardous	Batteries, cosmetics, chemicals	Hotels, spas, medical tourism sector	Toxic leachate, soil, and water contamination

Source: Primary Data, Researcher, 2025; supported by Bali Environmental Agency reports

A substantial portion of this waste is improperly managed, emphasizing the need for improved systems to handle the growing waste load on the island (Widyarsana & Agustina, 2020). Similarly, a study in the Tukad Bindu area found that increased tourism has led to rising waste production, requiring better waste management and monitoring strategies to ensure that ecotourism efforts do not exacerbate the problem. Effectively monitoring and evaluating waste management practices ensured their regional success (Negara et al., 2024). Research at the Talangagung Education Tourism Landfill demonstrated that implementing Waste-to-Energy (WtE) programs can provide both environmental benefits and alternative energy solutions. However, it also highlighted the need for comprehensive waste sorting and management practices to ensure the success of such programs (Dewi & Roziqin, 2022). These case studies provide valuable insights into the specific waste management challenges faced by different tourist hotspots in Bali, showing that solutions must be adjusted to each area's unique needs and contexts. However, indicates that despite the presence of such initiatives, waste management in Bali's mainstream tourism sector remains fragmented and lacks systematic integration with entrepreneurial and community-driven programs. Whereas earlier studies tend to focus on isolated solutions such as recycling, monitoring, or energy recovery, my research emphasizes the urgency of developing an integrated model that combines entrepreneurial innovation, educational initiatives, and participatory environmental programs. This broader approach addresses not only technical waste handling but also structural gaps that limit scalability, thereby extending the conversation from localized case studies to systemic change within Bali's tourism economy.

Bali, one of the world's most popular tourist destinations, faces escalating waste management challenges, primarily due to the enormous amount of waste generated by the influx of tourists. In 2021, Bali produced an estimated 4,281 tons of waste per day,

11% of this being plastic waste (Astuti et al., 2024). This waste production has placed immense pressure on the island's waste management infrastructure. The Suwung landfill, Bali's largest waste disposal site, is increasingly unable to cope with the growing waste volume (Muliarta, 2023). The accumulating waste at landfills has become a pressing environmental issue, as these dumpsites were not designed to handle such a large-scale waste load, leading to concerns over their long-term environmental impact.

This study examines the environmental impact of tourism-related waste in Bali and investigates how entrepreneurial initiatives can contribute to sustainable waste management solutions. Several studies emphasize the importance of community-driven initiatives in addressing waste management issues. Local programs, such as waste banks and community cleanup campaigns, have proven effective in improving recycling rates and reducing waste. Grassroots programs, such as waste banks (*bank sampah*), community-based recycling centers, and island-wide cleanup campaigns, have demonstrated tangible results in improving recycling rates, reducing illegal dumping, and promoting more responsible waste disposal behaviors among residents.

(Source: Danielle Muller / Greenpeace (BETAHITA NEWS, 2025))
Figure 2. The campaign to ban single-use plastic

Community-led efforts are particularly impactful because they go beyond short-term interventions; they cultivate environmental stewardship, foster social cohesion, and create opportunities for livelihood generation through recycling-based entrepreneurship. For example, waste banks not only serve as recycling hubs but also act as microeconomic institutions where residents can exchange sorted waste for monetary value or essential goods. These initiatives encourage environmental responsibility and foster a stronger sense of ownership within the local population, leading to more sustainable practices. Research suggests that when communities are empowered to take control of waste management processes, they tend to develop innovative and tailored solutions that can significantly improve the effectiveness of waste reduction efforts (Koski-Karell, 2019). Such community-based approaches are vital for Bali, where local engagement is key to

adopting sustainable waste management practices. Encouraging residents and businesses to participate actively in waste sorting and recycling at the source can help reduce the island's overall waste load and minimize the pressure on central waste management systems.

Entrepreneurial initiatives are crucial in addressing waste management challenges in tourism-intensive regions. In Bali, Indonesia, where tourism significantly contributes to environmental waste, various entrepreneurial approaches have emerged to tackle the issue sustainably. This literature review explores entrepreneurial waste management initiatives, including plastic recycling, digital waste banking, and community-based strategies. One prominent example of plastic recycling entrepreneurship is eCollabo8, which specializes in converting plastic waste into reusable materials. By utilizing advanced recycling technologies, eCollabo8 reduces plastic pollution, particularly in tourism areas where single-use plastics are prevalent. This initiative highlights the importance of private-sector involvement in sustainable waste management and circular economy practices.

A research by Dewi et al. (2024) highlights the role of Griya Luhu's Waste Digital Bank program, which exemplifies an innovative entrepreneurial solution that empowers rural communities in Bali to manage waste efficiently. By leveraging digital technology and a transparent waste banking system, the initiative incentivizes proper waste disposal while providing economic benefits to participants. This model aligns with the broader trend of integrating technology into waste management, improving efficiency, and fostering community participation.

Moreover, the findings from Dewi et al. (2024) in Tourism villages, such as Penglipuran in Bali, local entrepreneurs incorporate local wisdom into their waste management strategies. Households in Penglipuran actively segregate waste, with plastic bottles sold to generate income while reducing environmental pollution. This initiative demonstrates how traditional knowledge and community engagement contribute to sustainable waste management. The approach also underscores the value of local customs and cultural practices in fostering environmentally responsible behaviors. Entrepreneurs in Bali have also established community-driven waste management initiatives, including:

1. TPS3R (Tempat Pengolahan Sampah Reduce, Reuse, Recycle): Small-scale waste processing centers encouraging recycling and organic waste composting.
2. Composting Projects: These programs transform organic waste into compost, reduce landfill waste, and promote sustainable agriculture.
3. Community Participation: Engaging local stakeholders in waste reduction efforts to enhance sustainability and social responsibility.

Entrepreneurial initiatives in Bali's tourism waste management landscape illustrate diverse and effective strategies for tackling environmental challenges. From high-tech recycling companies to community-based waste banks and traditional knowledge-based waste practices, these initiatives provide valuable insights into sustainable entrepreneurship in waste management. Moving forward, technological innovation, community involvement, and policy support will be essential in achieving long-term waste management solutions in tourism destinations.

Source-based waste management, which involves processing waste locally, is another proposed strategy for tackling Bali's waste issues. This approach focuses on recycling and composting waste at its source, reducing the need for long-distance transport and centralized waste processing. By promoting the conversion of organic waste into compost and other valuable materials, source-based management can reduce the amount of waste that ends up in landfills (Muliarta, 2023). This strategy is supported

by policies such as Bali Governor Regulation Number 47 of 2019, which encourages sustainable waste practices among residents and businesses (Muliarta, 2023; Astuti et al., 2024)

Adopting source-based waste management reduces landfill dependence and empowers communities to take a more active role in waste reduction. By engaging locals in waste separation, composting, and recycling efforts, Bali can mitigate its waste management challenges while simultaneously promoting environmental sustainability. Integrated Sustainable Waste Management (ISWM) models have been recommended as an essential solution to Bali's waste management issues, particularly in the tourism sector. These models advocate for a holistic approach, involving collaboration between various stakeholders, including government bodies, businesses, and communities. Such an approach allows for the integration of waste prevention, reduction, recycling, and disposal strategies, ensuring a more effective and sustainable waste management system (Koski-Karell, 2019). The ISWM model is especially relevant to Bali's tourism industry, where the volume of waste generated requires a coordinated and comprehensive approach. Collaboration across different sectors, such as tourism, local government, and waste management services, is crucial for creating a waste management system that is effective and sustainable in the long term.

Policy measures play a critical role in ensuring sustainable tourism development in Bali. Various regulations, such as those aimed at reducing single-use plastics and promoting environmentally friendly practices, have positively impacted waste management behavior among locals and tourists (Astuti et al., 2024). The local government's commitment to enforcing these regulations is vital for their long-term success. To further enhance waste management efforts, policies should focus on education and awareness campaigns, particularly in the tourism sector, where tourist behavior significantly contributes to waste generation. Encouraging businesses to adopt sustainable practices and promoting waste reduction at the tourist level can drive Bali toward a more sustainable future.

Analyzing waste distribution patterns in Bali reveals that tourism is the primary contributor to the island's waste crisis. Hotels, restaurants, and beach clubs generate over 60% of Bali's plastic waste, with high-end resorts and international hotel chains producing significantly more per guest than budget accommodations. This disparity can be attributed to the extensive use of imported packaging, single-use amenities, and lavish dining experiences that often result in excessive food waste. One of the most pressing concerns is the dominance of plastic waste, which stems from the heavy reliance on bottled water, plastic-wrapped toiletries, and disposable dining utensils. Many luxury establishments prioritize guest convenience over sustainability, leading to the frequent replacement of amenities and excessive resource consumption. While some eco-conscious hotels and resorts have adopted waste reduction strategies, such as refillable toiletry dispensers and biodegradable packaging, their implementation remains inconsistent across the industry. Waste accumulation is most severe in popular tourist areas such as Kuta, Seminyak, and Ubud, particularly during peak seasons, overwhelming Bali's already strained waste management infrastructure. Inefficient collection systems, limited recycling facilities, and inadequate landfill space exacerbate the crisis, resulting in waste leakage into rivers and coastal areas. Consequently, Bali's renowned beaches and marine ecosystems face significant environmental degradation, impacting biodiversity and the island's appeal as a premier travel destination.

In contrast, local households and traditional markets generate significantly less plastic waste, with more biodegradable materials often repurposed or composted. Many Balinese households engage in traditional waste reduction practices, such as reusing

containers, making compost from organic waste, and using minimal packaging in daily transactions. Similarly, the agricultural sector mainly produces organic waste, which is reintegrated into farming practices. This circular approach helps reduce the burden on waste management systems, as much of the waste is reused or sustainably returned to the ecosystem. Industrial waste, while present, remains minimal compared to the vast quantities produced by tourism, as Bali's economy is not heavily reliant on large-scale manufacturing. Bali's industrial base is relatively small, and the few factories that operate primarily produce non-toxic waste materials, which are often handled more effectively than the waste generated by tourism-related businesses. The disparity in waste generation between the tourism sector and other sectors becomes even more evident when examining the inefficiencies in waste collection and disposal systems. The infrastructure for managing waste in tourist-heavy areas is often inadequate, leading to overflowing bins, waste accumulation in public spaces, and illegal dumping in rivers and oceans. On the other hand, the waste management systems in local communities and agricultural areas tend to be more efficient due to smaller-scale waste production and a stronger tradition of waste reuse. However, these systems still face challenges such as limited access to proper disposal facilities and a lack of modern recycling infrastructure, particularly in remote areas.

(Source: National Waste Management Information System - Ministry of Environment and Forestry, Republic of Indonesia)

Figure 3. Performance Targets for Waste Management in Bali (2024)

Based on the data from the chart, Bali's total waste generation in 2024 is projected to exceed 3.5 million tons, with the waste distributed across the nine regencies. Among these, Denpasar and Badung show the highest levels of waste generation. The waste reduction efforts, marked by Waste Reduction, are significantly lower than total waste generation, indicating a need for more robust waste management initiatives. Notably, a significant portion of the waste burden is attributed to the tourism sector, with an estimated 1,300 tons of waste expected to be generated during peak seasons. This highlights tourism's important role in Kuta, Seminyak, and Ubud's overall waste management challenge, especially considering the contributions from hotels, restaurants, and other tourism-related businesses.

One of the most pressing challenges arising from this influx of waste is the overflow in waste management systems, particularly in tourist-heavy areas. The Suwung landfill, located near Denpasar, serves as Bali's primary disposal site for waste. Originally designed to handle 1,000 tons of waste per day, the landfill now faces immense pressure, receiving more than 1,300 tons daily during peak tourist seasons, surpassing its capacity. This overburdened landfill, unable to cope with the increasing waste volume, contributes to environmental degradation and poses a significant challenge to the island's waste management infrastructure.

The data underscores the urgency of addressing the waste crisis in Bali. Tourism is a major contributor to the strain on existing waste management systems, particularly during peak seasons when waste generation is at its highest. Without a coordinated effort to enhance waste management infrastructure and adopt sustainable practices across all sectors, the situation will likely worsen, further threatening the island's environmental and economic sustainability.

This situation has led to widespread illegal dumping and open burning, both of which pose severe environmental and health risks. The illegal disposal of waste in unauthorized areas, particularly near rivers, beaches, and forests, contaminates natural landscapes, harms wildlife, and disrupts ecosystems. Open waste burning, often seen as a quick disposal solution, releases toxic pollutants such as dioxins and particulate matter into the air, which can cause respiratory problems and contribute to climate change. These hazardous practices threaten the environment and endanger the health of local communities and tourists, exacerbating Bali's already strained public health infrastructure.

Despite Bali's 2019 ban on single-use plastics, plastic pollution remains widespread due to weak enforcement and a lack of viable, sustainable alternatives. Although the law aimed to reduce plastic waste, enforcement has been inconsistent, and many businesses continue to use plastic products due to the absence of affordable or accessible substitutes. As a result, plastic waste remains a pervasive issue, particularly in tourist-heavy areas. Currently, only 48% of Bali's total waste is appropriately managed, meaning that nearly half of the island's waste is either dumped illegally, finds its way into waterways, or is disposed of by being burned in open spaces. This improper waste disposal significantly contributes to air pollution, which poses additional health risks and groundwater contamination, jeopardizing the island's water supply.

Food waste is another major issue, particularly within the tourism industry. Luxury hotels and large restaurants, many of which operate buffet-style dining, discard vast amounts of food daily, adding to the growing waste crisis. However, few programs exist to address this issue, such as composting or redistributing excess food to needy people. The lack of waste-reducing initiatives or efforts to repurpose food waste highlights a significant gap in the island's waste management strategies. In contrast, local households generate considerably less food waste. Traditional Balinese practices, which emphasize minimizing waste and repurposing leftovers, contribute to a more sustainable waste culture at the community level. This stark difference further emphasizes the tourism sector's disproportionate impact on Bali's waste crisis.

These findings underscore that Bali's waste problem is primarily driven by tourism, rather than local communities or other industries. The seasonal visitor surge exacerbates the waste overflow, placing immense pressure on the island's limited waste disposal infrastructure. During peak seasons, waste volumes skyrocket, and collection systems are overwhelmed, pushing Bali's waste management facilities beyond their capacity. Without urgent intervention, such as stricter enforcement of waste regulations, enhanced recycling initiatives, and promoting sustainable tourism practices, the imbalance between tourism-driven waste production and the island's waste management capacity will continue to threaten Bali's environmental sustainability. The situation calls for immediate and comprehensive action to reduce the tourism sector's waste footprint, ensuring the long-term health of the island's environment and the well-being of its residents and visitors.

Discussions

Tourism's Waste Impact: Where Does the Trash Go?

Bali's booming tourism industry has significantly worsened the island's waste problem, particularly in plastic and food waste from hotels, restaurants, and other tourism-related businesses.

(Source: Instagram Sam Bencheghib, The Free Press Journal, 2025)
Figure 4. Bali Trash Wave (2025)

The sector alone accounts for over 60% of Bali's plastic waste, with luxury resorts and international hotel chains generating the highest amounts due to single-use amenities, imported packaging, and excessive food waste. These businesses prioritize convenience and guest experience, often resulting in large quantities of disposable plastics, such as water bottles, toiletries, and packaging. In comparison, local households and traditional markets produce less waste, emphasizing repurposing organic materials, recycling, and composting, aligning with Bali's traditional waste minimization practices.

(Source: Bali Straits Times, November 2024)
Figure 5. Bali Waste Management, 2024

According to The Straits Times, approximately 48% of Bali's waste is managed responsibly through landfill or recycling, while the remaining 52% is mismanaged, including by burning, illegal dumping, or entering waterways. The improper disposal of waste is most evident in popular tourist destinations like Kuta, Seminyak, and Ubud, where waste collection services struggle to keep up with the overwhelming volume of refuse. The Suwung landfill, designed to handle 1,000 tons per day, now receives 1,300 tons daily during peak seasons, pushing it beyond capacity and leading to frequent overflows. This overburdened landfill exacerbates the island's waste crisis and contributes to environmental pollution, particularly affecting nearby rivers and coastal areas.

Illegal dumping has surged in tourist-heavy areas, as waste collection services cannot keep pace with the surge in waste generation. Open waste burning, a standard disposal method in some areas, further contributes to air pollution and health risks, as it releases harmful toxins into the atmosphere. Additionally, while Bali's 2019 ban on single-use plastics was a promising step toward reducing plastic pollution, weak enforcement and the absence of viable alternatives have rendered the ban largely ineffective. Many businesses continue to rely on non-biodegradable materials due to cost, convenience, and a lack of affordable substitutes, undermining the progress made through the policy.

These findings underscore that tourism is the primary driver of Bali's waste crisis. The seasonal influx of visitors generates an enormous volume of unmanaged waste, further straining the island's already overburdened waste management system. As tourism grows, this imbalance between waste production and management capacity will likely worsen, threatening the island's environmental sustainability. Without stricter enforcement of waste regulations, the implementation of more robust recycling initiatives, and the adoption of targeted waste management policies for tourism-related businesses, Bali's environmental health will continue to deteriorate. The government, the tourism sector, and local communities must work together to adopt sustainable practices that minimize waste generation and improve waste management infrastructure to secure Bali's healthier, more sustainable future.

The Role of Entrepreneurial Initiatives in Addressing Tourism-Driven Waste

Bali's tourism industry significantly exacerbates the island's waste crisis, particularly through the excessive plastic and food waste generation by hotels, restaurants, and other tourism-related enterprises. Research indicates that the tourism sector is responsible for over 60% of Bali's plastic waste, with luxury resorts and international hotel chains contributing disproportionately due to the widespread use of single-use amenities, imported packaging, and food overproduction (Provinsi Bali, 2024). These practices have led to an unsustainable cycle of waste generation, which strains Bali's waste management systems and threatens the island's pristine environment.

In response to these challenges, various entrepreneurial initiatives have emerged to promote sustainable waste management and reduce the environmental impact of tourism. Companies like eCollabo8 specialize in plastic recycling, transforming plastic waste into reusable materials, thus supporting circular economy practices in tourism areas. These businesses contribute to reducing plastic waste and creating valuable materials for reuse in other sectors, thereby developing a more sustainable tourism industry. Additionally, digital waste banking solutions, such as Griya Luhu's Waste Digital Bank program, leverage technology to facilitate waste collection and incentivize community participation. This innovative model encourages individuals and businesses

to properly sort and dispose of waste by offering rewards or incentives, fostering environmental and economic benefits (Dewi et al., 2024).

Community-driven models have also played a crucial role in addressing Bali's waste crisis. The TPS3R (Tempat Pengelolaan Sampah Reuse, Reduce, Recycle) waste management system, which promotes the sorting, recycling, and composting waste at the community level, has proven effective in diverting organic waste from landfills. Local stakeholders are actively involved in these efforts, with community members playing a hands-on role in waste management, composting, and recycling initiatives (Junita et al., 2024). These grassroots efforts not only help reduce the volume of waste sent to landfills but also encourage a cultural shift towards more sustainable practices within communities.

Despite these entrepreneurial and community-driven efforts, tourism's overwhelming volume of waste continues to challenge Bali's waste management infrastructure. The island's waste management systems are often overwhelmed, especially during peak tourist seasons, leading to waste overflow and pollution. Furthermore, the effectiveness of these initiatives is often hindered by insufficient policy enforcement, inadequate recycling facilities, and inconsistent waste segregation practices within the hospitality sector. Many hotels and businesses still fail to implement proper waste separation systems, and the lack of proper infrastructure for recycling or composting further limits the potential impact of these programs.

Strengthening the integration between private-sector innovations, local community involvement, and governmental regulations is essential to achieving long-term waste reduction and sustainability in Bali's tourism industry. Greater collaboration between the government, local businesses, and entrepreneurs will ensure that sustainable waste management practices are more effectively implemented and that Bali's tourism sector can thrive while minimizing its environmental footprint. The success of these initiatives hinges not only on innovation but also on comprehensive policy enforcement, improved infrastructure, and a collective commitment to reducing waste across all tourism industry sectors.

Policy vs. Reality: The Gap in Bali's Waste Management

Despite various efforts to combat Bali's waste crisis, a significant disparity persists between policy and real-world implementation. In 2019, the government introduced Gubernatorial Regulation No. 97/2018, which aimed to reduce Bali's plastic waste by 70% by banning single-use plastics such as plastic bags, straws, and Styrofoam. While this policy was intended to curb plastic pollution, enforcement has been inconsistent, and plastic waste remains widespread. Many businesses, including hotels, restaurants, and street vendors, continue distributing plastic products due to a lack of viable alternatives and weak oversight. Additionally, tourists, who play a significant role in waste generation, still rely heavily on plastic packaging, further undermining the effectiveness of the policy. The demand for single-use plastics has proven resilient, particularly in the absence of affordable, accessible alternatives, and weak regulatory enforcement allows many businesses to bypass the ban.

Beyond the plastic ban, the government has launched waste segregation programs and recycling initiatives to encourage households and businesses to separate organic and inorganic waste. However, Bali's waste collection infrastructure remains inadequate to support these efforts. While some resorts and businesses have implemented in-house waste management systems and recycling programs, the lack of comprehensive recycling facilities and inadequate waste processing capacity means that much of the segregated waste still ends up in illegal dumpsites or rivers. Reports suggest that only

48% of Bali's total waste is appropriately managed, with the remaining waste either left uncollected or disposed of through environmentally harmful methods such as burning or dumping in open spaces. This highlights the severe infrastructure limitations and difficulty in translating policy into effective waste management practices.

The Suwung landfill exemplifies the gap between policy intentions and reality. Originally designed to accommodate 1,000 tons of waste daily, the facility now receives more than 1,300 tons daily during peak tourist seasons, far exceeding its capacity. This overload leads to significant environmental degradation, including overflow, groundwater contamination, and increased pollution. Despite government promises to expand landfill capacity and improve waste treatment infrastructure, the Suwung landfill remains overwhelmed, contributing to the island's ongoing waste crisis. Illegal dumping has also surged, with over 1,000 informal dumpsites scattered across Bali, particularly in tourist-heavy areas like Kuta, Seminyak, and Ubud. These illegal sites exacerbate environmental pollution, with waste often reaching rivers, oceans, and scenic landscapes, further threatening Bali's natural resources.

These findings underscore the critical gap between Bali's waste management policies and their practical application. While Bali has made strides in addressing its waste issues through regulation and public awareness campaigns, the lack of robust enforcement, insufficient infrastructure, and the overwhelming waste production from the tourism sector have severely hindered progress. More vigorous policy enforcement, significant investment in recycling and waste management infrastructure, and increased collaboration between the government, private sector, and local communities are essential to bridge this gap. Only by closing this gap can Bali manage its waste crisis effectively, ensuring environmental sustainability while maintaining its status as a premier global tourist destination.

Conclusions

This study highlights the tourism sector's significant role in worsening Bali's waste crisis, with hotels, restaurants, and other tourism-related businesses generating over 60% of the island's plastic waste. Despite government policies such as the 2019 single-use plastic ban, weak enforcement, and insufficient infrastructure have limited their effectiveness, leading to continued illegal dumping, waste overflow, and environmental degradation. The findings indicate that Bali's waste management system is struggling to keep up with the rapid expansion of the tourism industry, particularly in high-traffic areas like Kuta, Seminyak, and Ubud.

A key discovery of this research is the disparity between policy and practice. While regulatory frameworks exist, enforcement mechanisms remain inadequate, and waste segregation programs lack proper infrastructure. The Suwung landfill, originally designed to handle 1,000 tons of waste per day, now receives 1,300 tons daily, pushing it beyond capacity. Furthermore, illegal dumpsites and open burning are standard practices, contributing to severe environmental and health hazards.

These findings underscore an urgent need for more effective waste management solutions, particularly in tourism-heavy areas. Stricter policy enforcement, investment in recycling infrastructure, and implementing sustainable tourism practices are critical to mitigating Bali's waste crisis. Additionally, Entrepreneurial initiatives in Bali's tourism waste management landscape illustrate diverse and effective strategies for tackling environmental challenges. From high-tech recycling companies to community-based waste banks and traditional knowledge-based waste practices, these initiatives provide valuable insights into sustainable entrepreneurship in waste management. Moving

forward, technological innovation, community involvement, and policy support will be essential in achieving long-term waste management solutions in tourism destinations.

For future research, a deeper examination of informal waste management systems, including local waste-pickers and community-led recycling efforts, could provide insight into alternative solutions that leverage local knowledge and participation. Additionally, longitudinal studies tracking the impact of recent waste management initiatives help determine their long-term effectiveness and areas for improvement. Further research could also explore the feasibility of circular economy models, such as waste-to-energy projects and eco-innovation in sustainable tourism, to create Bali's more resilient and environmentally responsible waste management system.

By integrating multi-stakeholder collaboration, including government agencies, private enterprises, local communities, and worldwide investors, Bali can work toward a more sustainable waste management ecosystem that balances economic growth with environmental preservation.

References

Utama, P. B. A., Hendrawan, I. G., Karang, I. W. G. A., & Pamungkas, P. B. P. (2023). Distribusi pencemaran sampah plastik pada sempadan sungai di Bali yang bermuara di perairan Selat Bali dengan analisis generalized additive models (GAM). *Journal of Marine Research and Technology*, *6*(1). https://doi.org/10.24843/jmrt.2023.v06.i01.p10

Astuti, N. N. S., Virginiya, P. T., Bagiastuti, N. K., & Septevany, E. (2024). The future of green tourism in Bali: Challenges and opportunities. *Journal of Applied Sciences in Travel and Hospitality*, *7*(2), 178–195. https://doi.org/10.31940/jasth.v7i2.178-195

Aysal, L. (2021). Strategies for climate crisis adaptation: Bringing indigenous and western knowledge systems together through theatre. In *Theatre Pedagogy in the Era of Climate Crisis*. https://doi.org/10.4324/9781003087823-4

Bali Province Central Bureau of Statistics (BPS: Badan Pusat Statistik). (2024). *International tourist arrival in Bali 2024*. https://bali.bps.go.id/id/statistics-table/2/MTA2IzI=/banyaknya-wisatawan-mancanegara-bulanan-ke-bali-menurut-pintu-masuk.html

Chotim, E. R. (2022). Talcott Parsons' sociological perspective in viewing social change in society in the new normal era. *Ijd-Demos*, *4*(1). https://doi.org/10.37950/ijd.v4i1.238

Creswell, J. W., & Poth, C. N. (2018). Creswell, J.W. 2013. Qualitative inquiry and research design. *Granola Gradschool and Goffman*.

Dewi, N. M. A., Chevalier, S. P., Triyuni, N. N., & Mudana, I. G. (2023). Green human resources management application to enhance environmental performance in Hotel Le Morgane, France. *International Journal of Green Tourism Research and Applications*, *5*(1). https://doi.org/10.31940/ijogtra.v5i1.1-15

Dewi, R. P., & Roziqin, A. (2022). Waste governance through the "waste to energy" program at the final processing site of talangagung education tourism in malang regency. *JPPUMA Jurnal Ilmu Pemerintahan Dan Sosial Politik Universitas Medan Area*, *10*(1), 71–87. https://doi.org/10.31289/jppuma.v10i1.6790

Dewi, W. W. A., Sarwono, B. K., & Pasandaran, C. C. (2024). Environmental campaign advocate through waste digital bank at rural area in Bali, Indonesia. *Jurnal Pengelolaan Sumberdaya Alam Dan Lingkungan*, *14*(2), 280–287. https://doi.org/10.29244/jpsl.14.2.280

Junita, M., Laksmi, P. A. S., & Hendrajana, I. G. M. R. (2024). Local wisdom in waste management: Penglipuran tourism village, Bali, Indonesia. *Proceedings of the 9th*

International Conference on Marketing and Retailing (INCOMaR 2023), March 1-2, 2023, Kota Kinabalu, Sabah, Malaysia, *133*, Mawar-1011. https://doi.org/10.15405/epsbs.2024.05.82

Koski-Karell, N. S. (2019). Integrated sustainable waste management in tourism markets: the case of Bali. *Indian Journal of Public Administration*, *65*(3). https://doi.org/10.1177/0019556119844559

Negara, I. M. W. S., Putra, A. A. N. S., Sumardani, R., Nasional Denpasar Bali, P., Pariwisata Lombok, P., & Komunitas Manajeman Perhotelan Indonesia, A. (2024). The role of local communities in waste management at Tukad Bindu tourist destination in denpasar bali. 8(1), 220–233. https://doi.org/10.37484/jmph.080112

Mentansan, G., Nauw, M., Awom, R., Ayorbaba, M., Lumi, J., & Reeve, D. (2023). Sasi local wisdom as a cultural capital for sustainable tourism development in Raja Ampat Regency, West Papua. *International Journal of Green Tourism Research and Applications*, *5*(1). https://doi.org/10.31940/ijogtra.v5i1.52-59

Muliarta, I. N. (2023). The concept of circular economy in the implementation of source-based waste management in Bali. *Indonesian Journal of Agriculture and Environmental Analytics*, *2*(2), 125–132. https://doi.org/10.55927/ijaea.v2i2.5456

Provinsi Bali. (2024). *https://balisatudata.baliprov.go.id/laporan/data-pengelolaan-sampah-per-kabupatenkota-di-provinsi-bali?year=2021*. https://balisatudata.baliprov.go.id/laporan/data-pengelolaan-sampah-per-kabupatenkota-di-provinsi-bali?year=2021

Putra, I. M. R. M. K., Mudana, I. G., Oka, I. M. D., & Nova, M. (2022). Pura Luhur Tamba Waras: Aspects of sustainable tourism and spiritual tourism. *International Journal of Green Tourism Research and Applications*, *4*(2). https://doi.org/10.31940/ijogtra.v4i2.108-114

Rudyana, A. P., & Rijal, N. K. (2022). Business track diplomacy: 4ocean effort in mitigation of plastic waste in Bali waters area. *Jurnal Inovasi Ilmu Sosial Dan Politik (JISoP)*, *4*(1). https://doi.org/10.33474/jisop.v4i1.15956

Sari, M. M., Suryawan, I. W. K., & Septiariva, I. Y. (2023). Processing of biodegradable waste from ceremonial activities in Bali with Black Soldier Fly (BSF) Larvae. *Journal of Multidisciplinary Applied Natural Science*, *3*(2). https://doi.org/10.47352/jmans.2774-3047.175

Sujawoto, F. A., Kartasudjana, T., Shishido, K., & Sarja, N. L. A. K. Y. (2023). Green tourism practices through Odesa social media storytelling method. *International Journal of Green Tourism Research and Applications*, *5*(1). https://doi.org/10.31940/ijogtra.v5i1.27-44

Suryawan, I. W. K., Wijaya, I. M. W., Sari, N. K., Septiariva, I. Y., & Zahra, N. L. (2021). Potential of energy municipal solid waste (MSW) to become refuse derived fuel (RDF) in Bali Province, Indonesia. *Jurnal Bahan Alam Terbarukan*, *10*(1). https://doi.org/10.15294/jbat.v10i1.29804

Urmila, N. P. W. D., Astuti, N. N. S., & Triyuni, N. N. (2023). The implementation of zero waste concepts in operational Six Senses Uluwatu, Bali. *Journal of Business on Hospitality and Tourism*, *8*(2). https://doi.org/10.22334/jbhost.v8i2.380

Widiana, I. K. A., Astawa, I. K., Triyuni, N. N., & Chaerunnisah, I. U. (2022). Documenting green hotel practices at The Apurva Kempinski Bali. *International Journal of Green Tourism Research and Applications*, *4*(2). https://doi.org/10.31940/ijogtra.v4i2.58-67

Widyarsana, I. M. W., & Agustina, E. (2020). Waste management study in the archipelago tourism area (Case study: Nusa Penida District, Bali Province,

Indonesia). *E3S Web of Conferences*, *148*. https://doi.org/10.1051/e3sconf/202014805002