
FROM PLASTIC CRISIS TO CIRCULAR TOURISM: WASTE GOVERNANCE FAILURES AND SUSTAINABLE TOURISM PATHWAYS IN BALI, INDONESIA

By

I Nengah Suardhana¹, I Wayan Kartimin², I Gusti Bagus Rai Utama³

¹Universitas Pendidikan Nasional

²Universitas Triatma Mulya

³Universitas Dhyana Pura

Email: ¹nengahsuardhana@undiknas.ac.id, ²wayan.kartimin@triatmamulya.ac.id,

^{3*}raiutama@undhirabali.ac.id

Article History:

Received: 13-01-2026

Revised: 21-01-2026

Accepted: 16-02-2026

Keywords:

Plastic Pollution; Sustainable Tourism; Waste Governance; Circular Economy; Sdgs; Bali

Abstract: Bali's tourism-led growth has created a paradox in which rapid economic gains coexist with worsening plastic pollution, recurrent urban flooding, and degradation of the coastal and marine ecosystems that sustain its appeal as a destination. Despite the adoption of a 2019 single-use plastic ban and source-based waste management policies, plastic waste volumes remained largely stagnant at about 408–414 tons per day between 2017 and 2019, exposing persistent implementation gaps. This study examines how waste governance failures, stakeholder behaviour, and tourism dynamics interact to shape Bali's plastic crisis, and evaluates the potential of circular-economy and community-based tourism models to shift current trajectories. Using a mixed-methods approach, it combines district-level statistics, policy and secondary data, and qualitative evidence from interviews and observations with communities, tourism businesses, informal waste workers, and officials. The findings highlight inadequate infrastructure, fragmented multi-level governance, weak enforcement, and low segregation at source, with only roughly half of waste properly managed and about 11% of plastic leaking annually to rivers and the ocean. At the same time, eco-village and circular initiatives achieve 20–25% waste reductions in pilot areas, signalling the viability of polycentric, community-driven approaches aligned with SDGs 11, 12, 14, and 17. The study integrates political ecology, implementation gap, collective-action, and circular-economy perspectives and proposes a multi-stakeholder governance framework, emphasising stronger source-based segregation and TPS3R, scaled-up circular tourism villages, context-specific deposit-return and extended producer responsibility schemes, and enforceable sustainability standards in the tourism value chain.

INTRODUCTION

For decades Bali has been promoted as a “paradise” destination, yet this image is increasingly undermined by pervasive plastic pollution that contaminates rivers, beaches,

and coastal ecosystems. The island's tourism-dependent economy generates very high volumes of waste, and plastic debris has become a visible symptom of deeper governance and development contradictions (Lord, 2024). Each monsoon season, unmanaged waste is carried by rivers to the sea and then washed back onto iconic beaches such as Kuta and Legian, where authorities and local communities struggle to clear tens of tonnes, sometimes around 60 tonnes, of plastic trash per day. At the provincial level, Bali produces roughly 1.6–1.7 million tons of waste annually, of which about 19–20% is plastic, yet only around 48–50% of this is handled through formal systems such as recycling or controlled landfills, with the remainder openly burned, dumped, or leaked into waterways and ultimately the ocean. District-level data show that total plastic waste volumes of approximately 408–414 tons per day remained largely stagnant between 2017 and 2019, with Denpasar contributing around 119–122 tons per day, Buleleng 65–66 tons, Badung and Gianyar around 44–46 tons, and the remaining districts roughly 14–40 tons per day (Suparta et al., 2022). This stagnation, despite the introduction of Governor Regulations on source-based waste management and single-use plastic restrictions, indicates that regulatory efforts have not yet produced meaningful reductions in plastic generation or leakage and has reinforced public concerns over the effectiveness of Bali's waste management regime (Giesler, 2018).

These conditions illustrate Bali's tourism–environment paradox, whereby tourism functions simultaneously as an economic engine and a driver of ecological degradation. Tourism contributes a sizeable share of regional GDP and employment, but it also intensifies solid waste generation, land-use change, water extraction, and pressures on coastal and marine ecosystems. Empirical studies show that tourists in Bali produce several times more waste per capita than residents, while many hotels and hospitality establishments still lack effective systems for waste segregation and recycling. Consequently, plastic pollution degrades ecosystems and public health and erodes destination competitiveness: littered beaches and polluted waterways directly contradict Bali's branding as a clean, high-quality tourism destination (Utama et al., 2024).

In response to the escalating crisis, the Bali Provincial Government has issued a series of key policies, notably Governor Regulation No. 97/2018 on restrictions of single-use plastics and Governor Regulation No. 47/2019 on source-based waste management, supported by Bali Waste Regulation No. 3/2021 and the Bali Clean Waste movement. These instruments seek to strengthen TPS3R (Reduce–Reuse–Recycle processing sites), promote household-level segregation, and gradually close the overburdened Suwung landfill (Yuliana, 2025). However, provincial reports and independent assessments indicate that landfill capacity remains exceeded, collection services are inconsistent, and a significant share of plastic waste continues to be burned or dumped illegally. From an implementation perspective, Bali's experience exemplifies what Pressman and Wildavsky describe as an "implementation gap": ambitious policies fail to deliver expected outcomes because of disjointed actors, bureaucratic complexity, and weak local buy-in. In Bali, these problems are aggravated by limited financial resources, fragmented responsibilities between provincial and district governments, and low enforcement capacity at the street level. In addition, top-down adoption of policy models from high-income contexts, such as extended producer responsibility (EPR), is not always adapted to local institutional and market realities, leading to partial or largely symbolic implementation (Pressman & Wildavsky, 1984).

Existing research on Bali's plastic pollution and waste management has made important contributions but remains fragmented. Many studies focus on technical assessments of waste generation, flows, and leakage or on descriptive accounts of individual policy instruments and community initiatives. While valuable, they rarely integrate political ecology, implementation-gap theory, collective-action perspectives, and circular-economy thinking to explain why, despite a proliferation of regulations and projects, Bali remains stuck in a high-waste, low-compliance equilibrium. Moreover, the tourism dimension especially how tourism actors and practices contribute both to the problem and to potential solutions is often treated separately from broader waste-governance debates (Ain et al., 2021). This study addresses these gaps by examining Bali's plastic pollution crisis through an integrated governance lens that connects waste flows, policy frameworks, stakeholder behaviour, and tourism-driven dynamics. The emphasis is not only on quantifying the scale of the problem but also on understanding why reforms have been difficult to implement and how alternative, more circular and community-based approaches could change current trajectories (Dodds & Butler, 2019).

Accordingly, the study is guided by four core research questions. First, it asks how waste mismanagement and plastic pollution affect tourism-dependent communities, ecologically sensitive areas, and marine ecosystems across the island. Second, it examines how governance and policy failures including the partial enforcement of the 2019 plastic ban and source-based waste management (PSBS) contribute to persistent plastic leakage and recurrent flooding events. Third, it investigates how stakeholder dynamics among tourists, residents, businesses, government agencies, NGOs, and informal waste workers shape waste management outcomes in practice. Finally, it explores which circular-economy and community-based interventions offer realistic pathways towards sustainable tourism development and the reduction of plastic pollution in Bali.

LITERATURE REVIEW

1. Global plastic production and marine leakage

Globally, plastic production has grown exponentially since the 1950s, with only a small fraction recycled and the majority landfilled, incinerated, or leaked into the environment. Comprehensive assessments indicate that only around 9% of all plastics ever produced have been recycled, underscoring systemic inefficiencies in linear, "take-make-dispose" models (Hahladakis, 2020). Marine plastic pollution has attracted particular concern, with landmark studies identifying countries such as Indonesia among the world's largest contributors of mismanaged plastic waste entering the ocean. The ecological impacts are severe, ranging from entanglement and ingestion by marine organisms to habitat alteration and the transport of invasive species (Brooks et al., 2020).

In coastal tourism destinations, plastic pollution is closely linked to both local waste management practices and broader consumption and packaging systems. Debris accumulation on beaches can reduce tourist arrivals and revenues, with some studies reporting tourism revenue declines of up to 60% in heavily polluted areas. These findings highlight the economic rationale for integrating plastic mitigation into tourism development strategies (Cusba et al., 2026).

2. Plastic pollution and tourism in Bali and Southeast Asia

Within Southeast Asia, archipelagic countries such as Indonesia, the Philippines, and Thailand face acute challenges in managing rapidly increasing plastic waste. Inadequate collection coverage, limited recycling infrastructure, and widespread open burning are common features, exacerbated by urbanisation and mass tourism (Hendrawan et al., 2023). In the Philippines, for instance, millions of tons of plastic waste are generated annually amid weak recycling systems, while in Thailand, entrenched single-use plastic habits contribute to significant marine debris. Bali shares many of these characteristics but with an added tourism intensity that amplifies waste generation and leakage. Studies indicate that tourists in Bali can produce 3–3.5 times more solid waste per day than local residents, and that a substantial portion of plastic waste originates from tourism-related activities, including packaging, beverages, and hospitality services. During rainy seasons, poor collection and clogged drainage systems result in plastic-laden floodwaters, with debris later washed onto beaches that are central to Bali's tourism appeal (Sedtha et al., 2022).

3. Waste governance, implementation gaps, and collective action

The literature on environmental governance emphasises that technical solutions are insufficient without robust institutions, coherent policies, and effective enforcement. Pressman and Wildavsky argue that implementation failure often arises from complex chains of decision-making and fragmented responsibilities, especially in multi-level government settings (Pressman & Wildavsky, 1984). In Bali, waste governance is dispersed across provincial, district, and village levels, with overlapping mandates and inconsistent coordination, creating room for slippage between policy intent and practice (Ain et al., 2021).

North's institutional economics underscores how historical failures and vested interests can lock systems into suboptimal equilibria, even when better technologies or policies are available. The persistence of the "collect-transport-dump" paradigm in Bali, despite the introduction of PSBS and TPS3R concepts, illustrates such institutional path dependence. Lipsky's notion of "street-level bureaucracy" further highlights how frontline workers and informal actors effectively co-produce policy outcomes, often deviating from formal rules due to resource constraints, conflicting incentives, or practical considerations. For instance, waste collectors in Bali may prioritise high-value recyclables such as PET bottles while neglecting low-value plastics that are more likely to leak into the environment (Sudiana et al., 2025).

Collective action theory, as articulated by Olson, provides another lens for understanding why communities and businesses often underinvest in waste management, even when they recognise long-term benefits. Free-riding, short time horizons, and fragmented stakeholder interests can hinder cooperation, particularly in tourism areas where the benefits of a clean environment are diffuse but the costs of improved waste management (e.g., fees, behavioural changes) are concentrated (Olson Jr, 1971).

4. Circular economy and sustainable tourism models

The circular economy (CE) has been promoted as a paradigm shift from linear resource use toward closed loops that prioritise reduction, reuse, recycling, and regenerative design. Foundational CE concepts emphasise "cradle-to-cradle" principles, where materials are designed to circulate indefinitely through technical or biological cycles, thereby minimising waste and pollution. The Ellen MacArthur Foundation and subsequent policy

initiatives in Europe and East Asia have translated these ideas into industrial, urban, and product-level strategies, including EPR schemes, deposit-return systems, and eco-design standards (Rodríguez et al., 2020).

In tourism, circular-economy approaches encompass waste minimisation, sustainable procurement, renewable energy use, and the integration of local, low-impact value chains. International examples from eco-tourism pioneers such as Costa Rica illustrate how integrated policy frameworks, payment for ecosystem services, and rigorous sustainability certification can sustain both biodiversity and tourism revenues. Iceland provides another reference case, with high renewable energy penetration, bottle deposit systems achieving return rates above 80%, and visitor education campaigns contributing to reduced plastic waste in tourism infrastructure (Manniche et al., 2021).

In Bali, the circular economy is emerging through a patchwork of initiatives, including TPS3R facilities, digitalised tourism villages, waste banks, and traditional villages adopting zero-waste practices. Notable examples include Penglipuran and Pererenan villages, where customary regulations (*pararem*) and community-based waste systems have significantly reduced visible trash and integrated environmental stewardship into the tourism experience. However, these successes remain localised and have not yet been scaled systematically across the island's tourism ecosystem (Ariati et al., 2025).

5. SDGs and plastic-smart tourism

The Sustainable Development Goals (SDGs) offer a comprehensive framework linking plastic pollution mitigation to broader objectives of sustainable cities, responsible consumption, marine conservation, and partnerships. SDG 11 calls for reducing adverse per capita environmental impacts of cities, including solid waste management; SDG 12 emphasises sustainable consumption and production patterns; SDG 14 targets marine pollution reduction; and SDG 17 stresses multi-stakeholder partnerships. For Bali, aligning tourism and waste policies with these SDGs implies not only infrastructure investment but also behavioural change, institutional reform, and cross-sector collaboration (Paraschi, 2023), (Christianto & Adinugraha, 2025).

RESEARCH METHODOLOGY

This study uses a mixed-methods design that combines quantitative analysis of waste and flooding data with qualitative examination of governance processes and stakeholder perspectives. It focuses on Bali Province's nine districts/cities, contrasting urban tourism hubs such as Denpasar, Badung, and Gianyar with more rural districts and key coastal conservation areas that are highly exposed to plastic pollution. Quantitative data include district-level plastic waste estimates for 2017–2019, provincial figures on total waste generation, composition, and leakage, baseline studies of waste handling (notably in Tabanan), flood records for Denpasar and Badung, and indicators of plastic density and distribution in conservation areas, which were harmonised by converting annual to daily values and adjusting for population change. Qualitative data comprise semi-structured interviews with government officials, tourism businesses, community leaders, NGOs, and informal waste workers, complemented by field observations of household segregation, TPS3R operations, informal collection, and disposal sites, as well as document analysis of

regulations, programme reports, and media coverage on Bali's waste and plastic policies (Maxwell, 2008).

The analysis integrates quantitative and qualitative techniques to develop a comprehensive picture of plastic waste dynamics and governance. Quantitatively, it relies on descriptive statistics and comparative assessment of waste volumes, leakage, and flood-related indicators across districts and over time, with particular attention to trends in plastic generation, the extent of stagnation or change, the relationship between drain clogging and flood frequency and duration, and differences in waste handling performance (Palinkas et al., 2011). Qualitatively, interview and documentary evidence are coded thematically around governance failures, implementation gaps, stakeholder roles, incentives, and circular-economy practices, following an abductive logic that iteratively connects empirical findings to theories of political ecology, collective action, and the circular economy. To strengthen validity and reliability, the study triangulates across multiple data types and sources to cross-check key patterns and reduce bias, while acknowledging limitations such as incomplete time-series data, possible response bias in interviews, and difficulties in isolating tourism-related waste in mixed-use areas. Consequently, numerical results are interpreted as indicative rather than exact, and the emphasis is placed on understanding patterns, mechanisms, and governance dynamics rather than on producing highly precise measurements.

RESULTS

1. Plastic waste generation and stagnation (2017–2019)

District-level data indicate that Bali's plastic waste generation remained high and relatively stagnant between 2017 and 2019. Total estimated plastic waste across the nine districts was around 408.2 tons per day in 2017, 414.4 tons per day in 2018, and again roughly 408.2 tons per day in 2019, reflecting a net change of approximately 0.5% over the period. Denpasar alone contributed around 119–122 tons per day, while Badung and Buleleng each generated between 45–66 tons per day, reflecting both population density and tourism intensity.

At the provincial scale, integrated assessments suggest that Bali produces around 1.6 million tons of waste annually, of which about 300,000 tons (approximately 19–20%) is plastic. Of this plastic waste, roughly 11%—equivalent to some 33,000 tons per year—is estimated to leak into rivers and the ocean, while only around half of total waste is handled through formal recycling or landfill systems. The persistence of high plastic volumes and substantial leakage, despite new regulations, indicates that policy interventions have not yet translated into systemic reductions in plastic generation or mismanagement.

2. Drainage clogging, flooding, and plastic redistribution

Evidence from hydrological and local government reports points to a strong association between plastic accumulation in drainage systems and urban flooding in Denpasar, Kuta, and surrounding areas. In neighbourhoods where more than 30% of drains were clogged by plastic and other solid waste, flood events were estimated to occur about 50% more frequently than in areas with less than 10% clogging. Moreover, floodwater stagnation in heavily clogged zones lasted approximately 2.3 times longer, increasing property damage, disruption to mobility, and health risks.

Post-flood assessments further reveal that floodwaters redistribute plastic waste from drainage channels and informal dumping sites into low-lying urban areas and coastal zones. Plastic debris densities in floodplains and along shorelines were significantly higher following major rainfall events, suggesting that flood episodes act as a mechanism for transferring land-based plastic directly into marine ecosystems. This process exacerbates the vulnerability of conservation areas and near-shore coral reefs, which are vital for marine biodiversity and tourism.

3. Governance failures and institutional fragmentation

Interview and document analysis converged on several recurring governance failures that undermine Bali's waste management reforms. Low segregation at source persists, as most households and many businesses still mix organic and inorganic waste despite regulations mandating source-based segregation, thereby reducing the recoverability of recyclables, increasing the volume of residual waste, and complicating TPS3R operations. At the same time, the traditional collect-transport-dump paradigm remains dominant in many districts, with waste management cantered on basic collection and transport to landfills or transfer stations and only limited investment in upstream reduction, segregation, and recycling.

These weaknesses are exacerbated by overloaded landfills and limited downstream capacity, most notably at the Suwung landfill, which has long exceeded its intended capacity, resulting in towering waste piles, periodic fires, and recovery facilities that can process only a fraction of daily generated waste. Enforcement and monitoring are also weak, as sanctions for non-compliance with plastic bags or source-based management are rarely applied and monitoring of businesses and communities is sporadic due to resource and capacity constraints. Furthermore, overlapping mandates between provincial, district, and village authorities fragment responsibilities and complicate planning and accountability, while vertical coordination with national agencies remains limited. Taken together, these findings resonate with implementation gap and street-level bureaucracy theories, illustrating how formal rules are filtered through complex bureaucracies and contingent frontline practices.

4. Stakeholder roles and behavioural dynamics

Stakeholder analysis reveals divergent perceptions and incentives regarding plastic waste and tourism. Tourism businesses, including many hotels and operators, generally recognise the reputational risks of plastic pollution but often prioritise cost minimisation and operational convenience; as a result, the adoption of waste segregation, refillable amenities, or alternative packaging tends to be concentrated in high-end or explicitly sustainability-branded establishments, while smaller operators may resist measures perceived as raising costs or disrupting service standards.

Local communities frequently voice frustration about the visible impacts of waste and flooding, yet some residents continue practices such as open burning or dumping, driven by limited infrastructure, irregular collection services, and entrenched habits; in certain cases, the belief that "waste fees have been paid" further reduces willingness to engage actively in segregation or community-based initiatives. Informal waste workers, for their part, perform much of the actual recovery of recyclable materials but do so under precarious conditions and understandably focus on high-value plastics, leaving low-value and multi-layer materials more likely to leak into the environment.

Government agencies tend to emphasise their progress in issuing regulations and launching campaigns, whereas NGOs and community groups stress the persistence of weak enforcement and the absence of genuinely inclusive planning processes; although collaborative efforts between these actors do exist, they are often fragmented and project-based rather than embedded in sustained, institutionalised platforms. Taken together, these dynamics exemplify collective-action problems, in which the benefits of a cleaner environment are widely shared but the costs of behavioural change and infrastructure investment are unevenly distributed among stakeholders.

5. Emerging circular and community-based solutions

Despite persistent systemic challenges, several promising initiatives demonstrate the potential of circular and community-based approaches. Eco-village and traditional village models, such as those in Penglipuran and Pererenan, have introduced customary rules that prohibit littering and open burning, mandate household-level waste segregation, and operate waste banks or zero-waste systems that are integrated into tourism products; evaluations indicate that these villages can reduce residual waste by roughly 20–25% while simultaneously improving environmental quality and visitor satisfaction.

In parallel, TPS3R and waste-to-resource initiatives in several districts convert organic waste into compost or animal feed (for example, through maggot cultivation) and separate recyclable materials, thereby decreasing the volume of waste transported to landfills; although their capacity remains limited, these facilities illustrate viable pathways for localised circularity when they receive adequate institutional support and market linkages. Complementing these efforts, emerging digital and smart-green tourism projects integrate digital technologies with circular-economy practices, including digitalised tourism villages that monitor waste flows, provide incentives for segregation, and promote eco-friendly services via online platforms, aligning waste management reforms with low-carbon, smart-green tourism narratives and offering scalable models for wider replication across Bali's tourism landscapes. Taken together, these experiences suggest that polycentric governance where local communities, businesses, and government actors jointly co-manage waste systems—can produce more resilient and context-sensitive solutions than purely top-down, centrally driven approaches.

Discussion

1. Bali's "plastic tourist trap" as a governance problem

The results confirm that Bali's plastic crisis is not merely a technical or behavioural issue but a governance problem rooted in institutional fragmentation, weak enforcement, and misaligned incentives. While tourists and tourism businesses significantly contribute to waste generation, the persistence of linear, low-accountability systems allows externalisation of costs onto communities, ecosystems, and future generations. Political ecology perspectives highlight how the benefits of tourism growth are unevenly distributed, whereas the burdens of pollution and flooding are disproportionately borne by local residents, coastal communities, and informal workers (Yuxi et al., 2025).

Implementation gap theory helps explain why Bali's progressive regulations have yielded limited tangible outcomes. Policy instruments such as plastic bans and source-based management require not only legal enactment but also adequate funding, clear institutional mandates, trained personnel, monitoring systems, and social legitimacy. In their absence,

policies risk becoming symbolic, with high-visibility announcements masking low-visibility non-compliance (Salam et al., 2024).

2. Collective action, incentives, and tourism value chains

Collective-action challenges are evident along the tourism value chain. Individual hotels may be reluctant to invest in circular practices if competitors continue using cheaper single-use plastics, while tourists may prioritise convenience over environmental considerations, especially when the consequences of their choices are spatially and temporally distant. Overcoming these dilemmas requires coordinated mechanisms such as industry-wide standards, certification schemes, and mandatory reporting, complemented by consumer education and incentive structures (Melenez-Roman & Font, 2026).

Extended producer responsibility and deposit-return systems are promising tools but must be adapted to Bali's institutional and market conditions. Simply importing policy templates from Europe without adjusting for local capacities and actor configurations risks replicating the implementation gaps observed in other domains. Instead, hybrid models that combine producer obligations, tourism levies, and community-based revenue sharing could create more robust and locally embedded funding streams for waste infrastructure and circular initiatives (Thompson, 2026).

3. Toward a circular tourism governance framework

The empirical evidence suggests that a circular tourism governance framework for Bali should be polycentric, SDG-aligned, and grounded in local institutions such as traditional villages. Key elements include:

- 1) **Upstream reduction and redesign:** Encouraging refill and reuse systems in hotels and restaurants, phasing out problematic packaging, and promoting eco-design in tourism products (Grasso, 2025).
- 2) **Source-based segregation and decentralised processing:** Consolidating PSBS implementation with adequate support for household segregation, TPS3R facilities, and community-based composting and recycling schemes (Idjal, 2025).
- 3) **Inclusive stakeholder platforms:** Establishing formal mechanisms that integrate government, tourism associations, traditional villages, NGOs, and informal workers in joint planning, monitoring, and benefit sharing (Mexia et al., 2026).
- 4) **Data-driven and digital tools:** Using digital platforms to track waste flows, monitor compliance, and provide feedback loops for continuous improvement in tourism areas (Christianto & Adinugraha, 2025).

CONCLUSION

This study has examined Bali's plastic pollution and waste governance challenges through the lens of sustainable tourism and circular economy. Quantitative evidence demonstrates that plastic waste volumes remain high and largely stagnant, with significant leakage into rivers and the ocean and strong linkages to urban flooding. Qualitative analysis reveals that these patterns are driven by persistent governance failures, including low segregation at source, an entrenched collect-transport-dump paradigm, overloaded landfills, and weak enforcement of existing regulations. The tourism sector both contributes to and is threatened by this crisis, as plastic-choked beaches and degraded ecosystems undermine Bali's competitive advantage as a destination. Yet emerging eco-village, TPS3R, and

smart-green tourism initiatives show that community-based and circular-economy approaches can significantly reduce residual waste, enhance environmental quality, and align local practices with SDGs 11, 12, 14, and 17. The findings underscore the need for a polycentric, multi-stakeholder governance framework that integrates political ecology, implementation gap, and collective-action insights into concrete institutional and policy reforms.

Recommendations

Building on the findings, the following recommendations are proposed for policymakers, tourism stakeholders, and communities:

- 1) **Strengthen source-based waste management (PSBS)** by ensuring universal access to regular collection, providing clear guidelines and infrastructure for household and business segregation, and integrating informal waste workers into formal systems through recognition and support.
- 2) **Scale up TPS3R and eco-village models** by prioritising investment and technical assistance for traditional villages and tourism villages that commit to zero-waste or low-waste targets, and by linking these initiatives to tourism marketing and certification schemes.
- 3) **Implement context-appropriate EPR and deposit-return schemes** for beverage containers and high-volume plastics, designed in collaboration with producers, retailers, tourism businesses, and local governments to ensure financial viability and effective collection.
- 4) **Embed circular-tourism standards in the hospitality sector**, making waste reduction, segregation, and plastic elimination mandatory criteria in licensing, classification, and destination branding processes.
- 5) **Enhance enforcement and monitoring capacity** by allocating dedicated budgets, training inspectors, leveraging digital tools for real-time reporting, and applying proportionate but credible sanctions for non-compliance.
- 6) **Foster multi-stakeholder partnerships aligned with SDGs** by establishing permanent forums that bring together government agencies, tourism associations, traditional villages, NGOs, universities, and financial institutions to coordinate strategies, share data, and co-create solutions.
- 7) **Invest in public awareness and environmental education**, especially targeting tourists, youth, and religious/cultural institutions, to reinforce norms of waste reduction, segregation, and stewardship of Bali's land and seascapes.

If implemented coherently, these measures can help shift Bali from a linear, crisis-prone waste system toward a circular, low-leakage model that supports high-quality, sustainable tourism and long-term ecological resilience.

REFERENCES

- [1] Ain, K. Q., Nasri, M. A., Alamsyah, M. N., Pratama, M. D. R., & Kurniawan, T. (2021). Collaborative governance in managing plastic waste in Bali. *IOP Conference Series: Earth and Environmental Science*, 905(1), 12115.
- [2] Ariati, N. K., Wirata, G., & Astawa, I. W. (2025). Sustainable Waste Management Model in Bali: Integration of Public Policy and Local Wisdom. *Iapa Proceedings Conference*,

- 273–288.
- [3] Brooks, A., Jambeck, J., & Mozo-Reyes, E. (2020). *Plastic waste management and leakage in Latin America and the Caribbean*.
- [4] Christianto, J., & Adinugraha, D. M. A. (2025). Smart & Green Tourism In Bali: Integrating Digital Technologies And Circular Economy Principles For A Low-Carbon Destination Development. *Journey: Journal of Tourismpreneurship, Culinary, Hospitality, Convention and Event Management*, 8(2), 201–214.
- [5] Cusba, J., Pacheco, C., Espinosa-Díaz, L., Laude, C., Fuerst, L., Obando-Madera, P., Valencia, F., & Ángel, N. (2026). Plastic pollution in marine coastal areas: Quantifying leakage and evaluating management responses. *Marine Pollution Bulletin*, 222, 118677.
- [6] Dodds, R., & Butler, R. (2019). The phenomena of overtourism: A review. *International Journal of Tourism Cities*, 5(4), 519–528.
- [7] Giesler, K. (2018). *The plastic problem: Plastic pollution in Bali*.
- [8] Grasso, M. (2025). Redesign Tourism Flows for Sustainability and New Models of Cultural Tourism. *Future of Business Administration*, 4(1), 35–57.
- [9] Hahladakis, J. N. (2020). Delineating and preventing plastic waste leakage in the marine and terrestrial environment. *Environmental Science and Pollution Research*, 27(11), 12830–12837.
- [10] Hendrawan, I. G., Pamungkas, P. B. P., Adibhusana, M. N., Maharta, I. P. R. F., Saraswati, N. L. G. R. A., Wilcox, C., & Hardesty, B. D. (2023). Characteristics and distribution of stranded plastic pollution in Bali conservation areas. *Marine Pollution Bulletin*, 197, 115770.
- [11] Idjal, M. R. (2025). *The Influence of Decentralisation on Tourism Development in Decentralised Rural Communities*. Oxford Brookes University.
- [12] Lord, J. (2024). *PLASTIC PARADISE*.
- [13] Manniche, J., Larsen, K. T., & Broegaard, R. B. (2021). The circular economy in tourism: transition perspectives for business and research. *Scandinavian Journal of Hospitality and Tourism*, 21(3), 247–264.
- [14] Maxwell, J. A. (2008). *Designing a qualitative study* (Vol. 2). The SAGE handbook of applied social research methods.
- [15] Melenez-Roman, J., & Font, X. (2026). Collective actions for sustainable tourism innovation. *Annals of Tourism Research*, 116, 104090.
- [16] Mexia, S. G., Ruíz, H. D. M., & Alonso, A. M. C. (2026). Circular Economy in Tourism: Pathways to Equity and Innovation. *Journal of Administrative Science*, 7(14), 6–13.
- [17] Olson Jr, M. (1971). *The Logic of Collective Action: Public Goods and the Theory of Groups, with a new preface and appendix* (Vol. 124). harvard university press.
- [18] Palinkas, L. A., Aarons, G. A., Horwitz, S., Chamberlain, P., Hurlburt, M., & Landsverk, J. (2011). Mixed method designs in implementation research. *Administration and Policy in Mental Health and Mental Health Services Research*, 38(1), 44–53.
- [19] Paraschi, E. P. (2023). STDs and SDGs: smart tourism and sustainability. *International Conference of the International Association of Cultural and Digital Tourism*, 449–469.
- [20] Pressman, J. L., & Wildavsky, A. (1984). *Implementation: How great expectations in Washington are dashed in Oakland; Or, why it's amazing that federal programs work at all, this being a saga of the Economic Development Administration as told by two*

- sympathetic observers who seek to build morals on a foundation* (Vol. 708). Univ of California Press.
- [21] Rodríguez, C., Florido, C., & Jacob, M. (2020). Circular economy contributions to the tourism sector: A critical literature review. *Sustainability*, 12(11), 4338.
- [22] Salam, R., Samudra, A. A., Suradika, A., & Sumada, I. M. (2024). Future policy implementation to balance growth and sustainability: Managing the impact of mass tourism in Bali. *Journal of Infrastructure, Policy and Development*, 8(9), 7927.
- [23] Sedtha, S., Nitivattananon, V., Ahmad, M. M., & Cruz, S. G. (2022). The first step of single-use plastics reduction in Thailand. *Sustainability*, 15(1), 45.
- [24] Sudiana, I. K., Sastrawidana, I. D. K., & Widiasih, N. N. (2025). Analisis Faktor Pendukung Dan Penghambat Efektivitas Pengelolaan Sampah Berbasis Sumber Di Kecamatan Buleleng. *ECOTROPHIC: Jurnal Ilmu Lingkungan (Journal of Environmental Science)*, 19(1), 68–80.
- [25] Suparta, I. N., Setiawina, N. D., Dewi, M. H. U., & Yadnyana, I. K. (2022). The influence of the tourism sector and financial performance on development performance in regencies/cities in Bali Province. *International Journal of Health Sciences*, 6(S4), 4318–4327.
- [26] Thompson, B. S. (2026). Does effective tourism management require collective action? Evidence from industry, community, and government stakeholders on shark dive ecotourism. *Tourism Management*, 112, 105268.
- [27] Utama, I., Suardhana, I. N., Sutarya, I. G., & Krismawintari, N. P. D. (2024). Assessing the impacts of overtourism in Bali: Environmental, socio-cultural, and economic perspectives on sustainable tourism. *Tour. Spectr. Div. Dyn*, 1(2), 81–92.
- [28] Yuliana, A. (2025). Comparison of Offering Waste Management Regulations from the Perspective of Environmental Law in Indonesia and India. *Indonesian Civil Law Review*, 1(2), 84–110.
- [29] Yuxi, Z., Ling-en, W., & Linsheng, Z. (2025). The tourist plastic footprint: a new framework to identify the contributions of tourists to plastic pollution. *Journal of Resources and Ecology*, 16(1), 193–205.