

PLASTIC WASTE MANAGEMENT DUE TO TOURISM ACTIVITIES AS AN EFFORTS TO CONTROL MARINE POLLUTION ON KUTA BEACH, BADUNG REGENCY

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Abstract

Kuta Beach, one of Bali's most iconic coastal destinations, faces severe environmental challenges due to the rapid growth of tourism and inadequate waste management, often leading to a "plastic apocalypse" scenario, especially during the monsoon season. This study analyzes the relationship between high tourist influx and the accumulation of marine debris, which is heavily dominated by plastic waste generated from both tourism activities and seasonal ocean currents. The research highlights that the traditional "collect-haul-dispose" system is inefficient to handle the volume of waste, which significantly reduces the beach's aesthetic appeal and threatens marine ecosystems. Using a descriptive qualitative approach, this research evaluates the role of stakeholders, including government and local communities, in implementing cleaner, sustainable waste management strategies. The findings suggest that a comprehensive, circular economy approach, combined with stricter, eco-friendly infrastructure, is necessary to maintain Kuta Beach's sustainability as a top tourist destination. **Keywords:** Waste Management, Kuta Beach, Tourism Impact, Plastic Pollution, Sustainable Tourism, Bali.

A. INTRODUCTION

Tourism has long been positioned as a leading sector that contributes significantly to regional economic growth through job creation, increased income, and the strengthening of local economic activities (UNWTO, 2019). However, the expansion of tourism that is not accompanied by adequate environmental management has the potential to cause ecosystem degradation, particularly in coastal areas that serve as centers of tourism activity (Hall, 2011). One of the most prominent forms of environmental pressure is the increasing production of plastic waste, which is closely related to tourist consumption patterns and the modern tourism industry (Jambeck et al., 2015). Plastic waste is characterized by its resistance to decomposition and can persist in marine environments for decades to centuries, posing serious ecological risks to marine organisms and food chains (Derraik, 2002). Various studies emphasize that without effective land-based management systems, coastal tourism areas become significant contributors to marine plastic pollution (Lebreton et al., 2017).

In the context of developing countries, the problem of plastic waste in tourism areas is exacerbated by limited institutional capacity, weak coordination among stakeholders, and low compliance with environmental management policies (Wilson et al., 2015). Indonesia is consistently identified as one of the major contributors to global marine plastic waste due to a combination of high single-use plastic consumption and suboptimal waste management systems (Jambeck et al., 2015). Research across various coastal tourism destinations in Indonesia shows that tourism activities, river flows, and residential areas are the dominant

sources of plastic waste accumulating on beaches (Purba et al., 2018). This condition reflects that the issue of plastic waste is not merely technical in nature, but is closely related to governance, stakeholder behavior, and the effectiveness of local management systems (Schuhmann et al., 2020). Therefore, the issue of plastic pollution in tourism destinations needs to be understood as a structural problem that requires a more integrative and contextual governance approach (Hall, 2011).

Kuta Beach in Badung Regency is an icon of Bali's tourism that bears environmental burdens due to the high intensity of tourist visits and economic activities. The increasing consumption of single-use plastic products by tourists, businesses, and local communities generates waste volumes that exceed the available management capacity (Keylavanda, 2022). Plastic waste that is not properly managed tends to be carried through drainage systems and rivers into the sea, triggering repeated coastal pollution. This condition not only reduces environmental quality and the aesthetic value of the tourism area but also has the potential to disrupt the sustainability of coastal ecosystems and the image of the tourism destination (Suryawan, 2025). Therefore, the problem of plastic waste at Kuta Beach represents a fundamental phenomenon that requires in-depth study regarding its management governance in a specific and contextual manner.

Several previous studies have examined the issue of plastic waste in coastal areas and tourism destinations. Cordova and Wahyudi (2016) found that plastic waste dominates the composition of marine debris in Indonesian waters and significantly contributes to coastal ecosystem degradation due to weak land-based management systems. Purba et al. (2018), through a study at Kuta Beach, showed that tourism activities and river flows are the main sources of plastic waste accumulating along the coastline, especially during the rainy season. Meanwhile, Lebreton et al. (2017) emphasized that countries with dense coastal tourism destinations, including Indonesia, face structural challenges in controlling plastic waste leakage into the ocean due to the growth of single-use plastic consumption. These three studies confirm that plastic pollution in coastal tourism areas is a multidimensional issue involving environmental, behavioral, and management system aspects.

The similarity between previous studies and this research lies in the shared focus on plastic waste as the primary source of marine pollution in coastal tourism areas. Earlier studies consistently highlight the high contribution of human activities particularly tourism and single-use plastic consumption to the increasing volume of marine debris. However, the fundamental difference of this study compared to previous research lies in its emphasis on governance aspects of plastic waste management, rather than solely on waste characteristics or quantities. This study goes beyond identifying sources and impacts by examining how actors, policies, and management mechanisms operate at the local level. Thus, it offers a more institutional and policy-oriented perspective in understanding plastic pollution at Kuta Beach.

This difference in focus forms the basis of the study's originality, as it integrates the issue of plastic waste pollution with the perspective of urban tourism governance. This research seeks to fill gaps in the literature by analyzing the interconnections between waste management policies, the role of local governments, the participation of tourism actors, and the involvement of local communities within a major tourism destination context. This approach enables a more comprehensive understanding of the challenges and opportunities in governance-based marine pollution control. Furthermore, this study specifically focuses on Kuta Beach, which has distinct social, economic, and tourism characteristics. Therefore, its contribution is both contextual and enriching to the discourse on environmental governance in tourism areas.

Based on empirical phenomena and findings from previous studies, the urgency of this research lies in the pressing need for effective and sustainable plastic waste management

models in coastal tourism areas (Laksmi, 2025). Without integrated governance, tourism growth risks exacerbating marine pollution and threatening the long-term sustainability of destinations. Kuta Beach, as a showcase of Bali's tourism, carries significant symbolic and economic implications, meaning that failures in environmental management in this area can have wide-ranging impacts (Nurhidayat & Nurchayati, 2025). This study is therefore important in providing an empirical basis for the formulation of more adaptive and collaborative plastic waste management policies. As such, it is not only academically relevant but also strategically important for regional policymaking.

The objective of this study is to analyze the governance of plastic waste management as an effort to control marine pollution in the Kuta Beach area, Badung Regency. Specifically, it aims to identify the roles and coordination among stakeholders in managing plastic waste in coastal tourism areas. It also seeks to evaluate the effectiveness of policies and management mechanisms implemented at the local level. In addition, the study aims to uncover the factors that hinder and support the implementation of plastic waste management. The findings are expected to provide governance-based policy recommendations to support sustainable coastal tourism.

B. LITERATURE REVIEW

Plastic Waste and Its Impact on the Marine Environment

Plastic waste is one of the most dominant types of inorganic waste found in coastal areas. It can fragment into microplastics that are harmful to marine organisms and have the potential to enter the human food chain (Novano, 2025).

Tourism and Waste Generation

Tourism activities contribute significantly to the increase in waste volume, especially in coastal tourist destinations. The lack of integrated waste management can worsen environmental pollution in coastal areas (Dinan et al., 2025).

Waste Management Policies in Bali

The Bali Provincial Government has issued various policies related to reducing single-use plastic waste as an effort to preserve the environment and support sustainable tourism (Mutaqien et al., 2025).

C. RESEARCH METHODOLOGY

This study employs a qualitative descriptive method. Data were collected through direct observation in the Kuta Beach area, interviews with relevant stakeholders (local government, sanitation managers, vendors, and the community), and documentation studies of policies and waste management reports. The data were analyzed qualitatively to describe the condition of plastic waste management and efforts to control marine pollution (Alaslan, 2023).

D. RESULT AND DISCUSSIONS

Sources and Types of Plastic Waste at Kuta Beach

The findings show that plastic waste is dominated by plastic bottles, food and beverage packaging, straws, and plastic bags. The main sources come from tourists and tourism-related business activities around the beach.

- **Land-based activities:** Household waste, market waste, tourism activities, and vendors around the beach that are not properly managed.
- **Rivers:** Flows from inland rivers carry plastic waste to the sea, especially during the rainy season, which is then transported by currents to Kuta Beach.

- **Ocean currents:** Sea currents and the west monsoon winds bring waste from other regions (such as East Java and West Bali) to Kuta Beach, making it an accumulation point.
- **Fisheries/port activities:** Although less dominant, fisheries and port activities also contribute to marine debris.

Plastic Waste Management

Efforts to manage plastic waste at Kuta Beach include the provision of segregated waste bins, routine beach clean-up activities, and the implementation of bans on single-use plastics. The involvement of local communities and environmental groups also plays an important role in maintaining beach cleanliness.

3R Principles (Reduce, Reuse, Recycle)

- **Reduce:** Minimize the use of single-use plastics by bringing reusable shopping bags, buying in bulk, and avoiding excessively packaged products.
- **Reuse:** Repurpose plastic bottles or containers into items such as stationery holders, plant pots, or other creative uses.
- **Recycle:** Sort plastic waste and dispose of it in inorganic waste bins so it can be processed into new products or raw materials.

Sorting and Recycling

- **Household sorting:** Separate plastic waste from organic and other types of waste to optimize recycling processes, as practiced in programs like “Operasi Semut.”
- **Macro recycling:** Factories establish shredding and recycling machines, while waste pickers play a crucial role in the process.
- **Technological innovation:** The government adopts technologies such as sensor-based systems and mobile applications, while innovations like pyrolysis convert plastic into fuel oil or energy sources.

Role of Individuals and Communities

- **Behavioral change:** Start with simple habits such as bringing reusable bags, replacing wet wipes with cloths, and consuming plastic products more wisely.
- **Education and awareness:** Increase awareness of the impacts of plastic waste and the importance of proper waste management.
- **Policy support:** Collaborate in supporting policies that reduce the production and consumption of single-use plastics.

Constraints and Challenges

Some of the challenges include low compliance among tourists with cleanliness regulations, lack of supervision, and limited waste management facilities and infrastructure. This indicates the need for improved education and stronger policy enforcement.

E. CONCLUSION

Managing plastic waste from tourism activities on Kuta Beach is a crucial effort to control marine pollution. Although various programs have been implemented, their effectiveness still needs to be improved through strengthened policies, environmental education, and collaboration between the government, businesses, the community, and tourists. Further research is recommended to examine the quantity of plastic waste generated and the effectiveness of policies in more depth.

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