



Marine Tourism: Recycle and Waste Management Program in the Gili Islands

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Abstract

The rapid development of tourism in this area has had a positive impact on the economic growth of the local community. However, the increase in the number of tourists also significantly impacts the volume of waste, organic and inorganic, generated daily. Waste problems in small island areas such as Gili are very complex due to limited land and inadequate waste management infrastructure. This research aims to comprehensively analyse the implementation of recycling and waste management programs on Gili Island. This research employs a descriptive quantitative approach to measure the level of implementation of recycling and waste treatment programs by the community, tourism businesses, and other relevant parties through the distribution of questionnaires with a measurable scale. The findings of this study indicate that the current efforts to implement recycling and waste management practices on the Gili Islands have not yet reached a level of effectiveness that could significantly address the environmental challenges faced by the region. The limited adoption and inconsistent execution of these programs suggest that there is still considerable room for improvement in promoting sustainable waste management among local businesses and communities. The findings of this research generate a set of constructive recommendations that can be utilized as practical guidance for policymakers, stakeholders, and local communities, with the ultimate aim of strengthening the overall framework of environmental governance in this ecologically fragile and vulnerable marine tourism area.

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Introduction

Gili Island, which consists of Gili Trawangan, Gili Meno, and Gili Air, is a premier tourist destination in North Lombok known for its underwater natural beauty and tropical atmosphere that attracts both local and international tourists (Taufik et al., 2025). The rapid development of tourism in this area has had a positive impact on the economic growth of the local community (Mason, 2020). However, the increase in the number of tourists also significantly impacts the volume of waste, organic and inorganic, generated daily. Waste problems in small island areas such as Gili are very complex due to limited land and inadequate waste management infrastructure (Alamsyah & A Liswahyuni, 2023).

Plastic recycling and waste management programs play an important role in preserving the environment, especially in tourist areas such as Gili Island, which has limited land and infrastructure (Merrington, 2024, Natalia et al., 2016). Plastic waste is a type of garbage that does not decompose easily in nature and can pollute marine ecosystems, damage coral reefs, and threaten the lives of marine biota that are the main attractions of marine tourism. Moreover, good waste management is one of the important indicators of sustainable development. Without structured waste management, piles of plastic waste can ruin the beauty of natural landscapes, reduce tourist comfort, and in the long run, threaten the very existence of tourism itself (Pleşea & Vişan, 2010). Therefore, plastic recycling and waste processing programs are strategic and urgent steps to ensure that tourism growth goes hand in hand with environmental preservation and the well-being of local communities (Adogu et al., 2015).

To maintain environmental sustainability, various recycling and waste management program initiatives have begun to be implemented by local governments, non-governmental organizations, and local tourism industry players (Bagustiandi, 2023). These programs include waste sorting, education for the community and tourists, and collaboration with third parties in the recycling process (Gibson, 2021). However, the



effectiveness of the implementation of these programs remains in question, especially in terms of community participation, environmental awareness, and infrastructure support (Selvia et al., 2025).

The central aim of this research is to conduct a detailed and comprehensive analysis of the implementation of recycling initiatives and waste processing programs on Gili Island. The study is designed not only to describe existing practices but also to evaluate their effectiveness in addressing the island's persistent waste management challenges. In order to achieve this objective, the research places particular emphasis on examining the different types of programs that have been introduced to date, including community-driven efforts, business-led initiatives, and government-supported schemes. By analyzing these programs in depth, the study is able to highlight the strengths they offer, while at the same time uncovering the limitations that hinder their success. A key focus of this research is on identifying the variety of challenges that emerge during program implementation. These challenges may take several forms, such as technical obstacles related to waste collection and processing facilities, institutional barriers linked to regulations, funding, and enforcement, or issues of community participation, where local engagement and awareness remain relatively low. By examining these barriers, the study aims to provide a clearer understanding of the underlying factors that influence the success or failure of waste management initiatives on the island.

In addition to assessing existing practices, the research also seeks to identify new opportunities and explore potential strategies for building waste management systems that are not only immediately effective but also environmentally and socially sustainable in the long term. Special consideration is given to the fragile ecological conditions of the Gili Islands, where the marine-based tourism economy depends heavily on maintaining a clean and healthy environment. Ultimately, the findings of this research are expected to produce constructive and practical recommendations that can strengthen environmental governance, improve local capacity, and contribute to the long-term preservation of this vulnerable island destination..

Materials and Methods

This study aims to comprehensively analyze the implementation of recycling and waste treatment programs in Gili Island. This research employs a descriptive quantitative approach to measure the level of implementation of recycling and waste treatment programs by the community, tourism businesses, and other relevant parties through the distribution of questionnaires with a measurable scale. This approach was chosen to describe systematically, factually, and accurately the phenomenon under study based on numerical data (Missen et al., 2016). In this research, the questionnaire was distributed using various online platforms to ensure wide accessibility and reach among respondents. The distribution process was carefully designed to target several specific groups considered highly relevant to the study's objectives, including business actors engaged in tourism-related activities, members of the local community, and other key stakeholders whose insights could provide valuable contributions to the research focus. After the questionnaires were disseminated and responses were received from these different groups, the researcher collected and organized the data systematically in preparation for further analysis. To interpret the results in a structured manner, a descriptive analysis was carried out, allowing the researcher to present the findings clearly and comprehensively. This type of analysis was chosen because it facilitates the identification of patterns, trends, and general tendencies within the collected data, without altering or manipulating the responses of participants. In conducting the descriptive analysis, the study employed a series of assessment indicators that served as guiding tools for data interpretation. These indicators, which are summarized and presented in the following table, were used to measure, evaluate, and categorize the information obtained, ultimately providing a more accurate and reliable basis for drawing meaningful conclusions from the research.

Table 1.1 Assessment Indicator

Precentage	Indicator
80-100	Very Effective
60-79	Effective
40-59	Less Effective
10-39	Not Effective

Results and Discussions

This study was carried out in the Gili Islands region, which consists of three small islands: Gili Trawangan, Gili Meno, and Gili Air, located in North Lombok Regency, West Nusa Tenggara. These islands were selected as the research site because they represent one of the most popular tourist destinations in the area, attracting both domestic and international visitors. However, alongside their rapid tourism growth, the Gili Islands also face pressing environmental issues, particularly concerning waste management. Among these, plastic waste has emerged as the most critical problem, posing threats to both the marine ecosystem and the overall sustainability of the islands as a tourism-based economy. The selection of this location was also motivated by the urgent need to address the increasing amount of waste generated by tourism activities, which has outpaced the capacity of existing facilities and local management systems. Therefore, this research aims to provide an in-depth examination of the extent to which recycling programs and waste processing initiatives have been introduced and implemented across the Gili Islands. By analyzing these efforts, the study seeks to understand their effectiveness and identify opportunities for developing more sustainable and integrated waste management strategies in the future

1. Recycle Program

The results of this study, as illustrated in Figure 1.1, demonstrate that the overall level of recycling initiative implementation across the Gili Islands remains relatively limited. The findings reveal that only around half of the businesses surveyed have adopted recycling programs specifically designed to manage and reduce the problem of plastic waste. This indicates that while certain companies have begun to engage in environmentally responsible practices by introducing recycling schemes, a considerable proportion of enterprises operating on the islands have not yet taken similar action. This uneven adoption reflects a broader challenge for waste management in the Gili Islands, where tourism-driven economic growth continues to generate increasing volumes of plastic waste. The partial implementation of recycling programs suggests that current efforts are insufficient to address the scale of the problem, and that without wider business involvement, the impact of such initiatives will remain limited. The fact that only fifty percent of surveyed businesses are participating also underscores the lack of uniform commitment within the private sector, where stronger environmental responsibility is urgently required.

The findings therefore point to the need for more comprehensive strategies to encourage greater participation from all stakeholders. This could involve the introduction of stricter regulations or incentives to ensure that businesses adopt recycling practices more consistently. In addition, raising awareness about the ecological and economic benefits of recycling could help motivate companies to take action. Strengthening collaboration between local authorities, community groups, and the business sector will also be vital in creating a more unified approach to reducing plastic waste. Overall, the relatively low level of recycling adoption highlights both the challenges that remain and the urgent need for stronger environmental policies, more inclusive participation, and long-term commitment to sustainable waste management across the Gili Islands

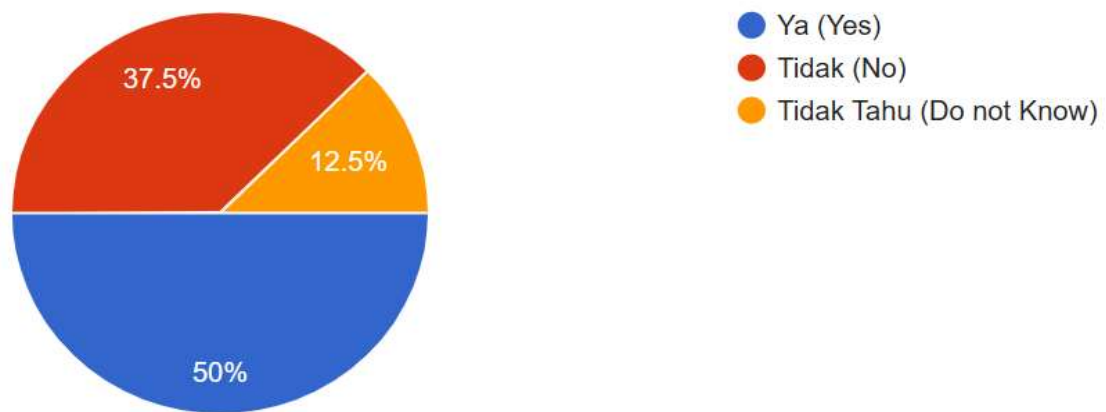


Figure 1.1 Recycling program in the Gili Islands (2025)

2. Waste Management

The findings of this study indicate that the overall application of waste management practices across the Gili Islands is still at a relatively low level. This conclusion is further emphasized by the data illustrated in Figure 1.2, which provides a clear overview of the current condition of waste management efforts on the islands. Based on the results, it was found that only 37.5% of businesses operating within the region have actually implemented structured waste management systems. This statistic demonstrates that less than half of the enterprises actively engaged in the islands' economic and tourism activities are contributing to sustainable waste practices.

The relatively small proportion of businesses adopting such systems highlights a considerable gap in environmental responsibility, particularly in an area that is highly dependent on maintaining ecological balance to sustain its appeal as a popular tourism destination. The absence of widespread waste management adoption not only reflects limited awareness among business operators but also indicates a lack of effective enforcement and coordinated support from relevant stakeholders. This low percentage signals the urgent need for stronger interventions aimed at raising awareness of the importance of waste management, while also creating practical solutions and incentives that encourage broader participation. Educational campaigns, financial support mechanisms, and collaborative programs between local authorities, businesses, and communities could play a vital role in bridging this gap. Thus, the findings stress the importance of enhancing both the scope and consistency of waste management initiatives across the Gili Islands. Strengthening policies, building partnerships, and promoting a culture of environmental responsibility are essential steps toward achieving more effective and sustainable waste management practices in the long term.

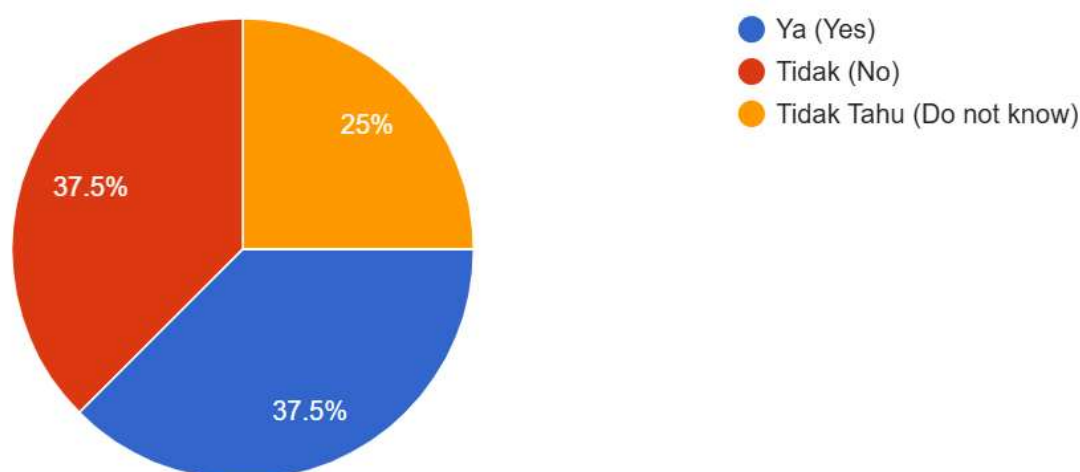


Figure 1.2 Waste Management in the Gili Islands (2025)

The findings of this study indicate that the recycling initiatives and waste management systems currently being implemented in the Gili Islands have not yet reached a level of effectiveness capable of addressing the pressing environmental problems that continue to affect the region. While there have been noteworthy attempts to establish practices aimed at reducing waste and promoting recycling, these efforts remain insufficient when assessed against the scale of the challenges the islands are facing. The adoption of recycling practices across different sectors is still relatively limited, and in many cases, implementation is inconsistent, fragmented, or lacking the necessary follow-through to generate meaningful outcomes. This inconsistency significantly reduces the overall impact of the programs and weakens their ability to bring about lasting change. The results further emphasize that substantial gaps remain in the way waste management is practiced and supported. Progress to date, while commendable in some areas, cannot be considered adequate, as it falls short of reducing the environmental pressures caused by growing tourism activities, rising waste volumes, and the vulnerability of small island ecosystems. The evidence clearly demonstrates that more comprehensive and coordinated strategies are required to strengthen existing initiatives and expand their reach.

One of the most urgent needs highlighted by the study is the importance of improving awareness, commitment, and active participation in sustainable waste management. This need applies not only to the local communities who play a direct role in everyday waste handling but also to the businesses that operate within the tourism sector, which is the primary driver of economic activity on the islands. Tourism-related enterprises, including hotels, restaurants, dive operators, and transport providers, generate a significant portion of the waste on the islands, and their involvement in recycling and reduction initiatives is essential (Yusoff et al., 2022). Similarly, local communities, who are integral to the functioning of daily activities, must be provided with the knowledge, motivation, and resources to engage meaningfully in waste reduction efforts.

Overall, the results of this research highlight an urgent call to action. Without significant improvements in education, stakeholder collaboration, and program consistency, the existing waste management systems will remain inadequate. Addressing these gaps will be critical to safeguarding the fragile ecosystems of the Gili Islands and ensuring that both residents and businesses can work together toward a more sustainable future. It requires some strategy to reach a high level of effectiveness in implementing a recycling and waste management program, such as;

- Strengthen education for the local community about recycling and waste management

A key element in promoting sustainable waste management practices is ensuring that local communities are provided with accessible and ongoing opportunities for hands-on learning (Subri et al., 2025). Such opportunities should be designed not only to increase knowledge but also to instill a deeper appreciation of the importance of reducing waste, reusing materials whenever possible, and disposing of waste in the correct manner. Continuous exposure to these practices can help transform waste management from a technical requirement into a shared community value. This process may involve the organization of various capacity-building activities tailored to different groups within the community. For example, seminars and workshops

can be held to introduce practical techniques for sorting waste, composting, or creating value-added products from recyclable materials. Awareness-raising campaigns and community events can serve to engage broader audiences, highlighting both the environmental and economic benefits of sustainable waste practices. Educational initiatives in schools, youth groups, and local organizations can further ensure that the principles of recycling and sustainability are embedded early and passed on to future generations. Additionally, providing practical demonstrations and training sessions allows participants to directly apply what they learn, reinforcing behavior change. Together, these efforts can significantly enhance community involvement and long-term commitment to effective waste management. By raising community understanding and involvement, people are more likely to support sustainable tourism development in places like the Gili Islands, embrace responsible waste management methods, and help create a cleaner environment (Pratama and Kamarubiani, 2021),(Debrah & Vidal, 2021)

- Emphasize collective work to reach a considerable recycling and waste management goal

Fostering collaboration between many stakeholders, including corporations, government agencies, NGOs, and local citizens, to collectively assume responsibility for enhancing trash management and recycling (Baud et al., 2006). When it comes to addressing environmental issues, isolated or fragmented actions often produce only temporary or limited outcomes. What is required instead are coordinated and well-organized efforts that bring together various stakeholders to create a more substantial and lasting impact. By moving away from individual or sporadic initiatives and working collectively, communities can achieve broader and more comprehensive environmental goals that extend beyond short-term improvements. Collaboration may take many forms, ranging from the establishment of shared recycling facilities that provide efficient waste processing for multiple households or neighborhoods, to the organization of regular community clean-up events that not only improve local surroundings but also encourage a culture of active participation and responsibility. In addition, cooperative policy implementation—where local governments, businesses, and residents jointly contribute to enforcing and supporting environmentally friendly regulations—ensures that sustainability initiatives are embedded into everyday practices rather than being treated as one-time projects. Such collective action does more than just address immediate waste or pollution problems. It also plays a vital role in strengthening the sense of sustainability, accountability, and ownership within the community. When individuals work together toward common goals, they begin to view environmental stewardship not as an obligation imposed from outside, but as a shared responsibility that benefits everyone (Bennett et al., 2018). This sense of shared commitment creates stronger social bonds, empowers local actors, and lays the groundwork for long-term environmental resilience. Ultimately, coordinated community-wide efforts hold the key to achieving meaningful and sustainable progress in environmental management.

- Support with enough resources

Supporting with enough resources means providing the necessary tools, funding, infrastructure, and manpower to ensure that recycling and waste management programs can function effectively (Taufik et al., 2024). An important component in strengthening waste management initiatives is the provision of adequate resources that can support the implementation and continuity of programs. This encompasses several aspects, such as the availability of proper waste disposal bins in strategic locations, which encourage both residents and visitors to separate and dispose of waste responsibly. In addition, the establishment of recycling facilities is essential to ensure that collected waste is processed efficiently and does not end up accumulating in open spaces or landfills. Financial assistance, whether in the form of government funding, subsidies, or incentive schemes for communities and businesses, also plays a vital role in motivating stakeholders to actively participate in sustainable practices. Equally important is the allocation of trained and skilled personnel who can manage, monitor, and evaluate operations on a consistent basis, ensuring that systems run smoothly and effectively. Without the presence of such resources, even initiatives that are carefully designed and well planned may fail to achieve their intended objectives, as implementation gaps often arise when programs lack adequate support. Conversely, ensuring that waste management efforts are supported with sufficient infrastructure, financial backing, and human resources can significantly improve operational consistency, enhance efficiency in recycling and disposal processes, and create a stronger foundation for achieving long-term sustainability. Ultimately, the provision of these resources not only increases the likelihood of program success but also helps foster a culture of environmental responsibility among stakeholders, thereby contributing to broader ecological preservation goals..

Conclusion

In conclusion, the overall implementation of recycling and waste management in the Gili Islands can still be categorized as relatively ineffective, with current practices falling short in addressing the increasing

environmental pressures associated with waste generation. Although some initiatives have been introduced, the findings of this study reveal that the measures taken remain inadequate when compared to the urgent needs of the islands' fragile ecosystem. Without significant improvement, the risks posed by unmanaged waste—such as pollution, health hazards, and the degradation of natural resources—are likely to persist and potentially worsen. To enhance the effectiveness of waste management systems in the Gili Islands, a number of strategic actions are necessary. First, there is a need to strengthen educational outreach and awareness programs for local communities, as increased knowledge and understanding play a critical role in encouraging active participation in recycling and sustainable waste practices. Building awareness should go hand in hand with fostering a strong sense of responsibility and environmental stewardship among residents and businesses. Equally important is the promotion of collaboration and collective action among key stakeholders. Meaningful engagement between community members, local business operators, government authorities, and non-governmental organizations is essential for creating a shared commitment to sustainability. Such partnerships can facilitate the pooling of resources, the exchange of knowledge, and the development of more coordinated and impactful initiatives. Furthermore, the long-term success of waste management strategies depends heavily on the availability of sufficient resources. Adequate funding, the establishment of proper infrastructure, and the involvement of trained and skilled personnel are crucial for ensuring that recycling and waste management programs are implemented consistently and sustainably. Future studies could build on these findings by exploring various models of community-based participation in waste management, with particular emphasis on identifying approaches that are most effective in fostering lasting behavioral change. This is particularly relevant in small island contexts such as the Gili Islands, where ecological vulnerability and dependence on tourism require integrated and sustainable solutions to environmental challenges.

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