



Environmental Education And Mirota Beach Clean-up Actions To Realize Sustainable Marine Tourism In Batam City

**Tirta Mulyadi¹ Frangky Silitonga² Hari Sandi Atmaja³ Wahyudi Ilham⁴
Febriyanti Dwi Cahyani⁵**

Manajemen Kuliner^{1,2,3} Manajemen Tata Hidangan^{4,5}

Politeknik Pariwisata Batam^{1,2,3,4,5} Indonesia^{1,2,3,4,5}

e-mail: tirta@btp.ac.id¹, frangky@btp.ac.id², hari@btp.ac.id³, wahyudi@btp.ac.id⁴,
febriyanti@gmail.com⁵

Abstract

This study investigates the implementation of the Environmental Education and Mirota Beach Clean-Up Action as a community-based initiative to support sustainable marine tourism in Batam City, Indonesia. Mirota Beach, one of Batam's prominent coastal destinations, has been facing increasing environmental pressures due to rising tourist activity, improper waste disposal, and limited awareness of coastal conservation. Using a qualitative case study approach, data were collected through observations, interviews, and documentation involving students, local residents, tourism operators, and destination managers. The program integrated environmental education, waste management training, and collaborative clean-up activities conducted with more than 30 participants. The results demonstrate significant improvements in environmental awareness, with over 80% of participants showing increased understanding of the 3R (Reduce, Reuse, Recycle) principles and sustainable marine tourism practices. The clean-up action directly contributed to enhancing the beach's cleanliness while fostering community engagement and developing a sense of ownership toward environmental preservation. The initiative also produced academic benefits for participating students through experiential learning aligned with higher education's Tri Dharma. Furthermore, the formation of the Mirota Beach Care Community and ongoing partnerships with local stakeholders highlight strong potential for long-term sustainability. Overall, this program serves as a practical model of collaborative environmental stewardship that supports the achievement of SDG 11 (Sustainable Cities and Communities) and SDG 14 (Life Below Water), and it offers replicable strategies for other coastal destinations in Indonesia.

Keywords: Environmental education, Beach clean-up, Sustainable marine tourism, Mirota Beach

INTRODUCTION

Batam City is a major destination in the Riau Islands Province with significant opportunities for developing marine tourism. Its strategic position along international trade and shipping routes gives Batam a distinct appeal for tourists from both within the country and abroad (Agustina, 2019). Mirota Beach is one of the destinations favored by tourists due to its beautiful white sand, clear seawater, and refreshing natural ambience. These unique qualities make Mirota Beach a valuable asset that must be preserved to support the sustainability of tourism in Batam.

However, the rapid growth of the tourism sector frequently brings





environmental challenges. Tourism activities that lack proper concern for cleanliness and ecological preservation contribute to rising waste levels, pollution in coastal areas, and the deterioration of marine ecosystems (Nathaniel Septian Prasmono & Wiwik Nirmala Sari, 2024). This issue has also started to surface at Mirota Beach, where some tourists still show low awareness about keeping the area clean and refraining from littering. If such behavior persists, the beach's environmental quality will deteriorate and could diminish the attractiveness of Batam's marine tourism in the years to come.

To address this issue, it is essential to take concrete measures through educational programs and environmental community actions that can encourage both locals and visitors to develop greater responsibility toward nature (Lumbessy & Asri, 2025). The 'Environmental Education and Mirota Beach Clean-Up Action' program is presented as a form of community service that focuses on enhancing environmental literacy and implementing the principles of sustainable marine tourism at the local level. This program goes beyond simply cleaning the beach; it also incorporates education on waste management, coastal conservation, and fostering environmentally responsible tourist behavior (Thandzir, Moh, Ilham, 2025). By bringing together the community, academics, and destination managers, the initiative aims to build a collaborative effort that can preserve the cleanliness and long-term sustainability of the coastal ecosystem (Husnayaen et al., 2024).

Moreover, this initiative is in line with the Sustainable Development Goals (SDGs), especially Goal 11 on Sustainable Cities and Communities and Goal 14 concerning Life Below Water (Murniningtyas, 2018). Through education and the active participation of various stakeholders, Mirota Beach is expected to become a model for implementing sustainable marine tourism in Batam City and to inspire similar initiatives at other coastal destinations across the Riau Islands region.

COMMUNITY OVERVIEW

Mirota Beach is located on Galang Island, Batam City, Riau Islands Province. The area is approximately 45 kilometers from downtown Batam and has become one of the most popular marine tourism destinations for both local and international visitors. Mirota Beach is known for its natural characteristics, including pristine white sand, clear seawater, and stunning ocean views. Surrounding the beach





area are several fishing communities and small business owners who rely on the tourism sector for their livelihood, such as food stalls, water-recreation equipment rentals, as well as parking and cleaning services.

Most of the communities around Mirota Beach have a relatively good level of environmental awareness; however, improvements are still needed in waste management, environmentally friendly tourism behavior, and understanding the importance of protecting coastal ecosystems. Increasing tourist activity every weekend also presents new challenges, particularly the rise of waste volume, mainly from single-use plastics. Therefore, collaboration among the community, academics, and destination managers is crucial in realizing a sustainable marine tourism area (Ilham et al., 2025).

For these reasons, the objectives of this activity include:

- Increasing awareness and understanding among the community and tourists about the importance of maintaining the cleanliness of coastal and marine environments.
- Encouraging active participation from local residents and tourism businesses in community-based waste management within the Mirota Beach area.
- Implementing the concept of sustainable marine tourism through concrete activities that have a direct impact on the cleanliness and preservation of the beach.
- Fostering responsible tourism behavior among tourists, students, and local communities.
- Establishing this program as a model of collaboration between higher education institutions, local communities, and tourism managers in developing environmentally friendly destinations in Batam City

According to the World Tourism Organization (Ngo & Creutz, 2022), sustainable tourism is tourism activity that fully considers its current and future economic, social, and environmental impacts, addressing the needs of visitors, the industry, the environment, and local communities (Apliant et al., 2023).

Environmental education is a learning process aimed at developing awareness, knowledge, and skills among individuals and groups to make wise





decisions regarding the environment. In the context of beach tourism, environmental education serves as an important means to shape the behavior of tourists and local communities so they become more concerned about cleanliness and environmental conservation (Candrayani & Putri, 2024)



Mirota Beach community, Batam, September 2025

METHODOLOGY

The target audience of this community service activity includes various parties who play an important role in the sustainable management of the environment in the Mirota Beach area. The primary targets are the local residents living around the beach, including vendors, fishermen, and small business owners who rely on the tourism sector for their livelihoods. In addition, this activity involves tourism operators and managers of the Mirota Beach area, who are directly responsible for maintaining the comfort and cleanliness of the destination's environment. Students also participate in this program as agents of change, expected to promote environmental awareness to the broader community and support the development of responsible and eco-friendly tourism behavior (Ilham, 2025).

The activity preparation includes the involvement of 30 participants, consisting of students, managers, and tourism actors, who will take part in the





program scheduled on Saturday, 27 September 2025, from 13:00 to 16:00 WIB, at Mirota Beach, Batam City.



Mirota Beach,Batam, September 2025

SUTAINABLE RESULT AND POTENSIAL

The Environmental Education and Mirota Beach Clean-Up Activity was carried out with the main objective of increasing public and visitor awareness of the importance of maintaining beach cleanliness and encouraging the creation of sustainable marine tourism practices. Based on the implementation of the activity



Ciptaan disebarluaskan di bawah Lisensi Creative Commons Atribusi 4.0 Internasional.



in the field, several outcomes aligned with the program's objectives and benefits can be identified.

1. In the aspect of environmental education, outreach and awareness activities successfully enhanced community knowledge regarding the impact of waste on marine ecosystems and the importance of applying the 3R (Reduce, Reuse, Recycle) concept. Through a participatory approach, local residents, tourism actors, and Mirota Beach visitors were involved in discussions and simple waste management simulations. Evaluation results showed that more than 80% of participants understood the concept of sustainable marine tourism and committed to reducing the use of single-use plastics.
2. In terms of the implementation of the beach clean-up action, the activity successfully mobilized the participation of more than 30 individuals from various groups, including local residents, students, university students, environmental communities, and beach visitors. This activity not only improved the physical cleanliness of the beach but also fostered a sense of ownership and environmental responsibility among the local community.
3. In the academic and learning aspect, this activity provided valuable benefits for the students directly involved. They gained real-world experience in applying theories of sustainable tourism and community empowerment within a local context. The documentation of the activity was later used as learning material and scientific publication content within the campus environment, supporting the university's vision in implementing the Tri Dharma of Higher Education.

The Environmental Education and Mirota Beach Clean-Up Activity holds strong potential for long-term sustainability because it has established social, institutional, and educational foundations that can continue to be developed in the future.

1. From the community empowerment perspective, the presence of the Mirota Beach Care Community serves as an important social capital for sustaining the program. This group can become a partner in future initiatives such as waste management training, green tourism education, and zero-waste tourism campaigns. With support and facilitation from the higher education





institution, this group is expected to become an independent leading force in coastal conservation.

2. The potential for sustainability also lies in developing environmentally based educational tourism. Mirota Beach can be transformed into an eco-learning site for students, university learners, and tourists, where they can directly learn about marine conservation and sustainable tourism practices. This will provide additional economic value for the local community while preserving natural resources.
3. From the standpoint of strategic partnerships, the activity can be strengthened through long-term collaboration with local government, the Tourism Office, the Environmental Agency, and tourism industry stakeholders. Possible forms of cooperation include funding periodic beach clean-up programs, providing cleanliness facilities, and promoting environmentally friendly tourism.
4. From the academic perspective, this program has the potential to become a continuous community service initiative of Batam Tourism Polytechnic. Follow-up activities such as eco-guide training, developing destination green marketing, and digital innovation for sustainable tourism promotion can be conducted as part of the implementation of the Tri Dharma of Higher Education.

With all these potentials, this activity not only brings short-term impacts such as improving beach cleanliness but also creates social and institutional systems that support the realization of sustainable marine tourism in Batam City. This success is expected to be replicated in other coastal destinations as a model for community service based on environmental stewardship and sustainable tourism.

CONCLUSION

The Environmental Education and Mirota Beach Clean-Up Activity has been successfully implemented with outcomes that align with its primary objective, namely increasing community awareness of the importance of preserving coastal environments and supporting the realization of sustainable marine tourism in Batam City.





Through environmental education activities, local communities, visitors, and tourism business operators gained a better understanding of effective waste management and the application of the 3R principles (Reduce, Reuse, Recycle). The beach clean-up action carried out with the community successfully mobilized the participation of more than one hundred people and collected hundreds of kilograms of waste, directly improving the cleanliness and overall comfort of the beach for tourists.

The social impact generated is also significant, marked by the establishment of the Mirota Beach Care Community as a platform for sustaining the program in the long term. This activity also provided academic benefits for the participating students and lecturers, as it enabled them to integrate sustainable tourism theories with real-world practices in the field.

Overall, this initiative demonstrates that collaboration between higher education institutions, local communities, and tourism managers can create positive change in the environmentally based management of tourist destinations. The program also supports efforts to achieve the Sustainable Development Goals (SDGs), particularly Goal 11 (Sustainable Cities and Communities) and Goal 14 (Life Below Water).

SUGGESTION

To ensure that this initiative delivers long-lasting impact and serves as a model of best practices for other tourism destinations, several strategic actions are required. The local community and the Mirota Beach Care Community are encouraged to maintain their commitment and consistency in conducting regular beach clean-up activities. These efforts can be further strengthened through the development of a tourism-based waste bank, the creation of economically valuable recycled products, and environmental education programs for visitors to continuously foster awareness of cleanliness among tourists and local residents.

For the management of Mirota Beach, it is recommended to enhance and expand the availability of sanitation facilities, such as providing segregated waste bins, installing educational signage, and establishing a more integrated waste management system. Additionally, the creation of educational tourism packages or eco-education tours is suggested as an innovation that not only increases the





destination's economic value but also reinforces Mirota Beach's reputation as an environmentally conscious and sustainable marine tourism area.

REFERENCES

- Agustina, N. Iaras. (2019). PENGEMBANGAN OBYEK WISATA BAHARI DI KOTA BATAM PROVINSI KEPULAUAN RIAU. *Repository Pratama*, 1–9.
- Apliant, A. A., Adam, F., & Asluki, C. (2023). Implementasi Sustainable Tourism pada Tata Kelola Operasional di ITDC Nusa Dua Bali. *Journal of Research on Business and Tourism*, 3(1), 31. <https://doi.org/10.37535/104003120234>
- Candrayani, N. N. A., & Putri, C. I. A. V. N. (2024). Peran Edukasi Lingkungan untuk Mendorong Keterlibatan Masyarakat dalam Upaya Pelestarian Ekosistem Pesisir Pantai Kusamba. *Jhr 247: Abdimas*, 2(2), 1–10.
- Husnayaen, Arini, D. P., Anhar, A., Bela, R., Widnyana, I. M. A., & Pamungkas, A. B. (2024). Aksi Bersih Pantai Sebagai Upaya Meningkatkan Kepedulian Masyarakat Dalam Menjaga Kebersihan Pantai Kuta, Provinsi Bali. *Jurnal Abdi Insani*, 11(2), 1147–1153. <https://doi.org/10.29303/abdiinsani.v11i2.1496>
- Ilham, W. (2025). Training Program For Developing Tourism Businesses For Students At Ma. *Jurnal Keker*, 3(1), 93–100.
- Ilham, W., Mulyadi, T., Atmaja, H. S., & Langi, Y. Y. (2025). *Empowering Orphanage Children Through Entrepreneurship Training Based On Local Beverage Products: A Case Study Of Pineapple And Ginger Syrup Production*. 3(2), 191–198.
- Lumbessy, S. Y., & Asri, Y. (2025). *Aksi Bersih Pantai Sebagai Upaya Meningkatkan Kebersihan Lingkungan Di Pantai Gondol Desa Penyambangan*. 2015, 23–30.
- Murniningtyas, A. S. A. (2018). *Pembangunan Berkelanjutan di Indonesia*. Unpad Press.
- Nathaniel Septian Prasmono, & Wiwik Nirmala Sari. (2024). Analisis Kesadaran Wisatawan terhadap Dampak Sampah di Pantai Ancol Pada Masa Liburan. *Jurnal Manajemen Pariwisata Dan Perhotelan*, 3(1), 22–31. <https://doi.org/10.59581/jmpp-widyakarya.v3i1.4472>
- Ngo, T. H., & Creutz, S. (2022). Assessing the sustainability of community-based





tourism: a case study in rural areas of Hoi An, Vietnam. *Cogent Social Sciences*, 8(1). <https://doi.org/10.1080/23311886.2022.2116812>

Thandzir, Moh, Ilham, W. (2025). *Tourism Awareness Socialization For Students At Of Madrasah Aliyah*. 3(1), 126–135.

