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SUSTAINABLE TOURISM MANAGEMENT STRATEGIES FOR COASTAL, ISLAND, AND HIGHLAND ECOSYSTEMS: A CASE STUDY OF BARRU REGENCY

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ABSTRAK

This study explores sustainable tourism management strategies in Barru Regency, focusing on coastal, island, and highland ecosystems. The research highlights the integration of environmental conservation practices, including mangrove planting on Pannikiang Island, pine tree planting in Lappa Laona High Land, and beach clean-up programs. These efforts have led to significant improvements in ecosystem preservation and waste management, despite challenges such as low public awareness and limited infrastructure. The findings emphasize the importance of enhanced education, collaboration with local communities, and infrastructure development to maintain long-term sustainability. The study concludes that more robust stakeholder cooperation and visitor education are essential for achieving sustainable tourism in Barru's diverse natural landscapes.

Keyword: Tourism, Management, Ecosystems, Island, Conservation, Highland.



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A.INTRODUCTION

Indonesia, a country endowed with extraordinary natural wealth, boasts a diverse range of natural attractions that captivate both local and international tourists. Its pristine beaches, majestic mountains, tropical forests, and national parks not only serve as significant sources of economic revenue for local communities but also function as vital conservation areas for biodiversity. However, the rapid growth of the tourism sector, particularly in natural attractions, has often led to adverse environmental impacts. Poorly managed tourism activities can result in ecosystem degradation, a decline in natural resource quality, and threats to the preservation of flora and fauna.

Tourism is a multi-dimensional and multi-disciplinary activity that involves a wide array of stakeholders, including tourists, local communities, the government, and businesses. It plays a crucial role in both the economic and social development of regions around the world (Agus Dwiyanto et al., 2018). As the demand for sustainable and responsible tourism grows, the integration of environmental conservation principles becomes increasingly important. This is particularly relevant in natural tourist destinations where maintaining the balance between tourism and ecological preservation is essential for long-term sustainability (Ministry of Tourism and Creative Economy of the Republic of Indonesia, 2020).

In Barru Regency, the management of natural tourist sites focuses on the preservation of ecosystems and environmental cleanliness. Notable conservation efforts include the planting of mangrove trees on Pannikiang Island to protect marine life and the banning of environmentally damaging activities such as illegal hunting (Kusumawati, 2020). These efforts reflect a broader commitment to eco-friendly tourism practices that aim to preserve the natural beauty and biodiversity of the area. Despite these positive efforts, challenges remain, particularly in waste management and the lack of adequate infrastructure to support these initiatives (Lee & Kim, 2021).

To address these challenges, environmental conservation approaches are essential. These approaches aim to ensure environmental sustainability while supporting the long-term viability of the tourism sector. Key strategies include sustainable natural resource management, visitor capacity control, educational programs for tourists on environmental preservation, and the adoption of eco-tourism principles. These efforts are further supported by various Indonesian laws and regulations, including:

1. **Law No. 32 of 2009 on Environmental Protection and Management**

- Establishes principles for environmental protection across various sectors, including tourism.
- Article 3 emphasizes the balance between environmental preservation and development.
- Articles 14–20 mandate environmental impact assessments (EIA) for tourism projects to identify and mitigate negative environmental effects.

2. **Law No. 10 of 2009 on Tourism**

- Advocates for responsible and sustainable tourism development.
- Article 5(c) highlights the importance of environmental sustainability in tourism development.
- Article 26 requires tourism operators to maintain the environmental carrying capacity of tourist sites.

The importance of environmental conservation lies in mitigating ecological impacts, such as soil degradation, pollution, habitat destruction, and biodiversity loss. By implementing appropriate conservation principles, natural attractions can remain sustainable resources for

communities and ecosystems while providing high-quality experiences for visitors. This study aims to explore how environmental conservation approaches can be applied in the management of natural attractions to minimize ecological impacts.

One notable example of eco-tourism destinations attracting visitors is Nature Tourism Parks (TWA). These conservation areas combine unique natural features with opportunities for recreation and education. TWAs play a crucial role in preserving biodiversity, preventing species extinction, protecting life-support systems, and promoting sustainable use of natural resources (Ramadhani et al., 2018). Unlike general nature-based tourism, eco-tourism directly benefits the environment, local culture, and community economy. For instance, while a nature tourist might simply observe birds, an eco-tourist engages with local guides, stays in community-owned accommodations, and contributes to the local economy. Eco-tourism emphasizes interpretation and learning experiences delivered by small-scale tourism operators, prioritizing local ownership, particularly in rural communities.

Protected areas aim to prevent environmental degradation by enhancing soil, water, climate, plant, and animal functions, as well as preserving historical and cultural values (Presidential Decree No. 32 of 1990, Article 2). Factors influencing eco-tourism development in mountain ecosystems include maintaining tourism potential, empowering local communities, and ensuring activities provide environmental education without causing harm. Effective spatial management in protected areas should be structured and divided into zones for scenic viewing, family tourism, education and research, outdoor activities, and meetings, while addressing accessibility, accommodation, and safety (Riyanto et al., 2014).

Coastal and marine regions offer considerable opportunities for sustainable development, particularly through marine eco-tourism. This form of eco-tourism encompasses well-organized, strategic activities that harmonize cultural heritage, environmental protection, and the well-being of local communities. Coastal ecosystems not only provide recreational benefits but also contribute economically to both local populations and visitors. By developing these areas as tourism destinations, they can yield both spiritual and financial rewards.

One of the most promising eco-tourism resources is mangrove ecosystems. Mangroves are uniquely suited for eco-tourism development due to their distinct characteristics and the ability to maintain the authenticity of their habitats and organisms. Areas with unique and authentic attributes have a higher value and appeal to tourists (Wahyunindyawati & Dyanasari, 2017). Mangrove eco-tourism serves as a means to preserve the environment while offering unique and sustainable visitor experiences.

B. RESEARCH METHODOLOGY

This study employs a qualitative research methodology, aimed at exploring the implementation of environmental conservation approaches in the management of natural tourism destinations and their impact on reducing ecological damage. The qualitative approach was chosen to provide a comprehensive understanding of the phenomenon through rich and detailed data obtained from informants' perspectives. A case study design was adopted to investigate specific practices and outcomes at the selected research site, offering a holistic view of how conservation strategies are integrated into tourism management and their implications for the local ecosystem and community.

Data collection involved in-depth interviews, participatory observation, and document analysis. Semi-structured interviews were conducted with key stakeholders, including tourism managers, visitors, local communities, and government officials. These interviews provided insights into the strategies, challenges, and perceptions surrounding the implementation of environmental conservation measures. Direct observations of tourism activities at the study site helped identify the ecological impacts and the effectiveness of the conservation practices. In addition, relevant documents such as policy reports, management records, and visual documentation were analyzed to complement and validate the primary data.

The research site was the Office of Tourism, Youth, and Sports in Barru Regency, located on Sultan Hasanuddin Street, a strategic area connecting Makassar and Parepare. The site was selected due to its relevance to issues of environmental conservation and tourism management, as well as its potential to illustrate the ecological impacts of tourism activities. Thematic analysis was employed to analyze the data, following a systematic process of familiarization, coding, theme identification, and interpretation. This approach ensured that the findings were both contextually grounded and aligned with theoretical frameworks, contributing valuable insights to global.

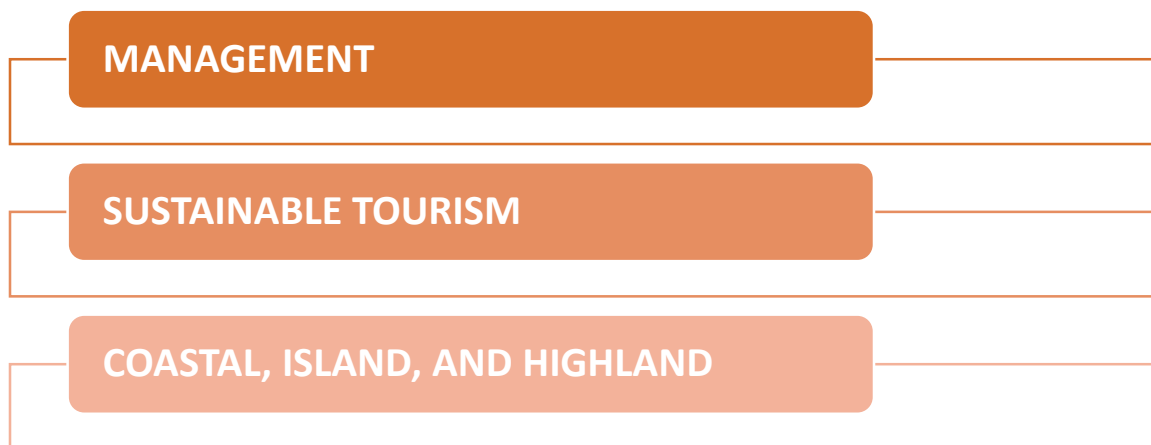


Figure 1 Framework diagram

C. RESEARCH RESULTS AND DISCUSSION

Tourism is an encompassing activity related to travel that is multidimensional and multidisciplinary, arising from the needs of individuals and nations, and the interactions between tourists, local communities, other tourists, governments, local authorities, and entrepreneurs. The environmental conservation principles applied in managing natural tourist destinations in Barru Regency focus on ecosystem preservation and environmental cleanliness. On Pannikiang Island, which is largely covered with mangrove forests, conservation efforts include mangrove planting programs aimed at preserving marine life and prohibiting environmentally harmful activities, such as illegal shooting. Furthermore, Pannikiang Island is registered with the Natural Resources Conservation Center (BKSDA) and is in the process of being designated as a nature reserve. At Lappa Laona, concrete steps include the planting of pine trees as part of the broader efforts to maintain environmental sustainability, carried out in collaboration with various relevant agencies. In terms of waste management, despite having designated personnel for regular cleaning, challenges remain regarding improper waste disposal by visitors and the lack of waste transportation facilities. As a temporary solution, waste is burned, although this results in air pollution. To address this issue, the Tourism Office has conducted environmental sanitation management training for destination managers, so they can utilize waste as a resource, such as converting household waste into economically valuable products. Additionally, community initiatives like "Clean Friday" in Ujung Batu, where residents collectively pick up plastic waste, are implemented to maintain beach cleanliness and environmental health. These efforts reflect Barru Regency's commitment to preserving nature and maintaining a clean environment in its tourist destinations.



Figure 2 Pannikiang Island, Barru Regency

From interviews with Mr. Kasriadi, Youth Staff at the Department of Tourism, Youth, and Sports of Barru Regency, the researcher concluded that the management of natural tourist sites in Barru Regency integrates environmental conservation principles, focusing on ecosystem preservation and environmental cleanliness. On Pannikiang Island, conservation is achieved through mangrove planting and restrictions on harmful activities, with the island being prepared for designation as a nature reserve. Meanwhile, at Lappa Laona, greening efforts with the planting of pine trees represent concrete steps in environmental conservation. However, waste management still faces challenges, including visitors' lack of environmental awareness and the limited waste disposal facilities. While waste is temporarily burned, this method poses air pollution risks. The local government has provided waste management training and involves the community through activities like "Clean Friday" to raise environmental awareness. Overall, the steps taken demonstrate a commitment to ecosystem sustainability, but improvements are needed in technical management, supporting facilities, and visitor education to holistically support environmental sustainability.

The management of natural tourist destinations in Barru Regency ensures that tourism activities do not harm the environment and can be sustained through several concrete measures. In the Ujung Batu area, the first step was installing information boards urging visitors not to dispose of waste carelessly, including baby diapers, to raise visitor awareness. Additionally, wastewater from visitors' bathing is directed to a special drainage system to prevent contamination of the beach or sea. Waste management is conducted in collaboration with the Environmental Agency (DLH) for waste transportation after cleaning. However, a key challenge in environmental management is the low level of public awareness, particularly regarding the habit of burning waste due to the lack of waste transportation facilities. To address this, efforts such as waste management training and finding solutions for utilizing waste as organic fertilizer are being pursued, particularly in areas like Pannikiang Island. There are also infrastructure challenges, such as damage to mangrove trekking paths and impassable bridges, which need to be repaired by the provincial authorities. Cleaning up hazardous debris, such as wood and nails, that pose risks to visitors is also a priority. These efforts, despite facing various obstacles, aim to protect the environment and ensure natural tourist destinations can be safely and sustainably utilized.

Based on the interview results, the researcher concluded that the management of natural tourist destinations in Barru Regency focuses on sustainability and environmental conservation through several concrete steps. In the Ujung Batu area, the installation of information boards and the provision of special drains for wastewater are aimed at increasing visitor awareness of the importance of maintaining environmental cleanliness. Collaboration with the Environmental Agency (DLH) is also conducted for waste transportation after cleaning. However, environmental management faces significant challenges, including the low public awareness regarding the habit of burning waste due to the lack of waste transportation facilities. To address this, waste management training and efforts to utilize waste as organic fertilizer, especially in areas like Pannikiang Island, are being pursued. Furthermore, infrastructure issues, such as damage to the

mangrove trekking paths and bridges, need immediate attention from provincial authorities. The cleaning of hazardous debris, such as wood and nails, that pose risks to visitors is also an important consideration.



Figure 3 Ujung Batu Beach, Barru Regency

Overall, while the management of natural tourist destinations in Barru Regency has implemented positive steps to protect the environment, various challenges remain, particularly concerning public awareness, infrastructure, and waste management. The main challenge in applying a conservation approach at natural tourist sites in Barru Regency is the low public awareness among managers, visitors, and relevant stakeholders. The lack of awareness about cleanliness and environmental conservation is a significant barrier, as tourism managers often work alone without active support from other agencies, such as the Environmental Agency, as well as from visitors and surrounding communities. Despite various efforts, such as involving the Tourism Awareness Group (POKDARWIS) in waste management and cleanliness education, community participation in environmental conservation activities remains very limited. Additionally, the low level of education and understanding about the importance of maintaining cleanliness and environmental sustainability presents a major challenge. This hampers efforts to raise awareness and encourage greater participation in maintaining the environment at natural tourist sites.

Based on the interview with Mr. Kasriadi, the researcher concluded that the main challenge in applying a conservation approach at natural tourist sites in Barru Regency is the low public awareness among managers, visitors, and relevant stakeholders. The low awareness of the importance of cleanliness and environmental preservation is a major obstacle in conservation efforts. Tourism managers often have to work alone without active support from relevant agencies, such as the Environmental Agency, and from visitors and surrounding communities. Despite various efforts, such as involving the Tourism Awareness Group (POKDARWIS) in waste management and cleanliness education, community participation in environmental conservation

activities remains very limited. The low level of education and understanding about the importance of maintaining cleanliness and environmental preservation further exacerbates the situation, hindering efforts to raise awareness and foster participation in environmental conservation at natural tourist sites.

Overall, the low awareness and lack of involvement from various parties in environmental management present a significant challenge in ensuring the sustainability of ecosystems at natural tourist sites in Barru Regency. Therefore, further efforts are needed to enhance environmental education and strengthen collaboration between managers, communities, and relevant agencies. The management of natural tourist destinations in Barru Regency emphasizes the importance of effective communication with visitors to educate them about environmental conservation. Tourism managers are expected to lead by example in maintaining environmental sustainability, ensuring that visitors understand the necessary steps to preserve cleanliness and the environment. One concrete step is the installation of information boards urging visitors to dispose of waste in designated places. Additionally, tourism managers engage members of the Tourism Awareness Group (POKDARWIS) to assist in maintaining cleanliness and reminding visitors and local communities not to dispose of waste improperly or engage in practices that harm the environment. Communication is also conducted with local fishermen to prevent activities that could damage the ecosystem, such as dynamite fishing. By involving all parties—managers, visitors, and local communities—it is hoped that environmental sustainability can be well maintained.

Based on the interview results, the researcher concluded that the management of natural tourist sites in Barru Regency emphasizes the importance of effective communication with visitors as an effort to educate them about environmental conservation. Tourism managers are expected to lead by example in maintaining environmental sustainability, ensuring that visitors understand the necessary steps to maintain cleanliness and the environment. A concrete step is the installation of information boards encouraging visitors to dispose of waste properly. Furthermore, managers also involve members of the Tourism Awareness Group (POKDARWIS) to help maintain cleanliness and provide reminders to visitors and local communities not to dispose of waste improperly or engage in environmentally harmful practices. Communication efforts also include providing information through appropriate channels to prevent activities that may harm the ecosystem, such as dynamite fishing. By involving all stakeholders—managers, visitors, and the local community—it is hoped that environmental sustainability will be well maintained and conservation efforts can continue sustainably. This inclusive communication approach is expected to strengthen collective awareness and increase active participation in environmental conservation at natural tourist destinations in Barru Regency.

The application of the conservation approach in managing natural tourist sites in Barru Regency has had a positive impact on both the ecosystem and the surrounding community. The environment, particularly the beaches, has become cleaner from plastic waste due to regular

cleaning activities every Friday. The removal of plastic waste from the beaches prevents damage to marine ecosystems, such as coral reefs. On Pannikiang Island, mangrove planting has also provided significant benefits, including protecting coastal areas from storms and sea waves, and serving as a sanctuary for various marine species. Mangrove forests also help prevent erosion with their strong root systems. Overall, conservation efforts in Barru Regency not only preserve the environment but also benefit the ecosystem and local communities, such as protecting harbors and providing habitats for marine species and birds. The environmental conservation efforts in the area have had a significant positive impact, and it is hoped that they will continue with the involvement of more stakeholders, including students, to preserve natural tourist destinations for future generations.



Figure 4 Lappa Laona Highland

Based on the interview results, the researcher concluded that the application of the conservation approach in managing natural tourist sites in Barru Regency has had a significant positive impact on the ecosystem and surrounding communities. One notable example is the regular Friday cleaning activities, which have significantly reduced plastic waste on the beaches, directly preventing damage to marine ecosystems such as coral reefs. This success highlights the important role of waste management in maintaining beach cleanliness and the preservation of marine ecosystems. On Pannikiang Island, mangrove planting has provided substantial benefits, not only in protecting the coastline from dangerous sea waves but also in serving as a refuge for various marine species. The mangrove forest also helps prevent erosion through its strong root systems, enhancing the resilience of the coastal environment.

Overall, environmental conservation efforts in Barru Regency not only preserve the environment but also benefit the ecosystem, such as protecting harbors and providing habitats for marine species and birds. This approach has had a significant positive impact, and it is hoped that it will continue with greater involvement from various parties, including students, in preserving

natural tourist destinations for future generations. Thus, environmental conservation in Barru Regency benefits not only the environment but also the well-being of the local community and the potential for sustainable ecotourism development. Interview dates: November 21, 2024, and December 12, 2024, Informant: Mr. Kasriadi, Position: Youth Staff at the Department of Tourism, Youth, and Sports of Barru Regency Age: 34 years.

D. CONCLUSION AND SUGGESTIONS

Based on the research findings and discussion above, the following conclusions and recommendations can be made:

- **Conclusion**

The management of natural tourist attractions in Barru Regency has effectively integrated environmental conservation principles, focusing on ecosystem preservation and environmental cleanliness. Efforts such as mangrove planting on Pannikiang Island and pine tree planting in Lappa Laona demonstrate significant strides towards maintaining natural resources. The implementation of waste management programs, despite challenges such as public awareness and waste disposal facilities, reflects a commitment to sustainable tourism. However, issues like low public awareness, insufficient waste management infrastructure, and environmental degradation due to irresponsible visitor behavior remain significant hurdles.

The conservation measures, including regular beach clean-ups and mangrove planting, have yielded positive outcomes, contributing to the protection of marine ecosystems and coastal areas. Still, more extensive education and active community involvement are necessary to ensure long-term sustainability. In conclusion, while progress has been made, ongoing efforts in awareness, infrastructure development, and collaboration between stakeholders are essential to sustaining the conservation of Barru's natural tourist sites.

- **Suggestions**

1. **Increase Public Awareness:** Continuous education and outreach programs should be conducted to enhance public understanding of the importance of environmental conservation and proper waste management. This can be achieved through collaborations with local communities, schools, and other stakeholders.
2. **Improve Waste Management Infrastructure:** Barru Regency should invest in better waste collection and disposal facilities at tourist destinations, including bins for specific types of waste and waste transportation services. This would help reduce littering and improve cleanliness.

3. **Strengthen Stakeholder Collaboration:** More active involvement from local governments, environmental agencies, and the private sector is crucial. Strengthening partnerships with local organizations, such as Kelompok Sadar Wisata (POKDARWIS), and enhancing cooperation with the community can ensure more effective conservation practices.
4. **Expand Conservation Programs:** Broader initiatives, such as the development of additional green spaces, reforestation, and the protection of wildlife habitats, should be considered to further enhance ecosystem preservation in Barru Regency.
5. **Enhance Visitor Education:** Efforts to educate visitors on responsible tourism practices, such as not littering and avoiding damage to the environment, should be incorporated into tourism promotions and guides. Informational signage and regular communication can help promote better practices among tourists.
6. **Develop Infrastructure for Eco-Tourism:** Improvements in eco-tourism infrastructure, such as better trekking paths, safer bridges, and environmental-friendly facilities, are essential to support the growing tourism sector while maintaining environmental sustainability.

By addressing these issues, Barru Regency can strengthen its commitment to sustainable tourism and environmental conservation, ensuring the preservation of its natural heritage for future generations.

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