

## Evaluation of the Impact of Tourism on Environmental Sustainability at the Situ Bagendit Tourist Destination

Dani Adiatma\*<sup>1</sup>, Deden Firman Syuyaman Rukma<sup>2</sup>

Universitas Garut<sup>1,2</sup>  
Email: [adiatmadani@gmail.com](mailto:adiatmadani@gmail.com)

### Abstract

This research evaluates the impact of tourism on environmental sustainability at Situ Bagendit, a natural tourist destination in Garut Regency, West Java. The increase in tourist numbers has led to both positive and negative environmental impacts, such as water pollution, waste accumulation, and ecosystem degradation. The mixed-methods approach used in this study involved field observations, interviews with local stakeholders, and surveys with tourists and residents. The findings indicate significant challenges, including pollution from motorized boats and inadequate waste management, but also highlight increased community awareness and sustainable initiatives. The study recommends improvements in environmental regulations, waste management systems, and educational programs for tourists.

**Keywords:** Tourism, Environmental sustainability, Situ bagendit, Environmental impact, Waste management

---

### A. INTRODUCTION

Tourism is a rapidly growing economic sector in various countries, including Indonesia, where it significantly contributes to national economic growth, regional income, and the welfare of local communities. However, the increase in tourism activities can lead to various environmental impacts, particularly when management practices do not adhere to sustainability principles. Situ Bagendit, a natural tourist destination in Garut Regency, West Java, exemplifies how tourism development can threaten environmental sustainability if not managed properly (Alonso-Muñoz et al., 2022; Liu, 2003).

Situ Bagendit is renowned for its stunning lake views and tranquil atmosphere, serving not only as a tourist attraction but also as a water conservation area and a source of livelihood for local communities. However, the rise in tourist visits has led to environmental challenges, including a decline in lake water quality, damage to surrounding vegetation, and increased waste generated from tourism activities (Buckley, 2012). The concept of environmental sustainability is crucial in managing natural tourist destinations. According to Buckley, (2012), sustainability in tourism involves maintaining a balance between tourism growth and the preservation of natural resources for future generations, which includes ensuring the welfare of local communities that depend on these resources.

In recent years, Situ Bagendit has attracted both local and international tourists, drawn by the lake's beauty and various recreational activities such as boating, fishing, and cycling. The local government of Garut Regency recognizes the potential of Situ Bagendit as a source of regional income and has initiated the development of supporting infrastructure, including parking lots, accommodations, and restaurants. However, this infrastructure development has often occurred without adequate planning regarding its environmental impacts (Yasarata et al., 2010).

In recent years, Situ Bagendit has attracted the attention of local and international tourists. The beauty of the lake and the various activities it offers, such as boating, fishing and cycling around the lake, make this destination increasingly popular. The local government of Garut Regency sees great potential in

\* Corresponding author

Received: November 4, 2024; Revised: December 19, 2024; Accepted: December 27, 2024

developing Situ Bagendit tourism as a source of regional income. In line with the increase in tourist visits, various supporting facilities such as parking lots, accommodation and restaurants began to be built around the lake area. However, this infrastructure development has not been accompanied by careful planning regarding environmental impacts.

The increasing number of tourists has also led to a rise in the use of motorized boats, which pose a risk of water pollution. Additionally, human activities such as littering and the construction of commercial facilities without proper zoning have further harmed the lake's ecosystem. The heightened consumption of clean water and energy in tourist areas also raises concerns about the availability of natural resources for local communities (Renfors, 2020). While tourism in Situ Bagendit generates economic benefits, including job creation and increased income from the trade and services sector, the environmental impacts threaten the area's long-term sustainability. Therefore, it is imperative to evaluate the effects of tourism on environmental sustainability at Situ Bagendit and develop improved management strategies (Gustiarini, 2023).

Although tourism in Situ Bagendit provides economic benefits for the local community, such as job creation and increased income from the trade and services sector, the environmental impacts caused can threaten the long-term sustainability of this area. Therefore, it is important to evaluate the impact of tourism on environmental sustainability at Situ Bagendit and develop better management strategies.

The environmental impacts of tourism at Situ Bagendit can be categorized into three main areas: water pollution, ecosystem damage, and inadequate waste management. The lake's water quality is vital for the ecosystem and supports local flora and fauna. However, tourism activities, such as the use of motorized boats and waste disposal from commercial facilities, have degraded water quality. Research indicates that water pollution levels at Situ Bagendit have increased alongside rising tourist numbers, disrupting aquatic life and threatening the health of local residents who rely on the lake for daily needs (Cardinali et al., 2020).

Uncontrolled tourism activities have also led to the degradation of vegetation around the lake. The water catchment area, essential for maintaining the lake's water quality and quantity, has diminished due to the development of tourist infrastructure. This damage results in the loss of natural habitats for various species of flora and fauna that inhabit the area (Ziaabadi et al., 2017).

Waste management presents a significant challenge at Situ Bagendit. Tourists often dispose of waste carelessly, both around the lake and in the water. The existing waste management system struggles to cope with the volume of waste generated, particularly during peak tourist seasons. Improper disposal of plastic and organic waste not only detracts from the area's natural beauty but also pollutes the water and disrupts aquatic ecosystems (Kusumardani et al., 2022).

Despite its scenic appeal and role as an economic asset, Situ Bagendit faces considerable environmental challenges due to the rise in tourism. Key issues include water pollution, excessive waste, and ecosystem damage. These problems not only threaten environmental sustainability but also jeopardize the long-term viability of the area as a tourist attraction.

The purpose of this research is to evaluate the impact of tourism on the environmental sustainability of Situ Bagendit and to propose strategies for mitigating negative effects while promoting sustainable development. This research is crucial for enhancing the understanding of the relationship between tourism and environmental sustainability at Situ Bagendit. By comprehensively assessing the impacts, authorities and tourism managers can formulate more effective policies to protect the environment while promoting tourism growth. This study aims to provide a clear overview of the environmental challenges faced and the opportunities for developing more environmentally friendly tourism practices at Situ Bagendit (Sharpley, 2020).

## B. RESEARCH METHOD

This research employs a mixed-methods approach designed to provide comprehensive insights into the environmental impacts of tourism at Situ Bagendit. The study integrates qualitative and quantitative methods to ensure a thorough understanding of the issues. The mixed-methods approach combines qualitative data from interviews and observations with quantitative data from surveys and environmental assessments. This dual approach allows for cross-validation and a deeper exploration of the findings (Mrabti & Alaoui, 2024). The Data Collection Techniques use for this research are:

1. Field Observations: Conducted to document immediate environmental impacts such as litter accumulation and water quality.
2. Interviews: Semi-structured interviews with stakeholders, including residents and tourism managers, provided qualitative insights into the perceived environmental changes and challenges.
3. Surveys: Distributed to both tourists and residents to gauge environmental awareness and behavior.

The study engaged residents, tourist attraction managers, and tourists. A total of 200 survey respondents included 100 tourists and 100 residents, ensuring a balanced perspective from both visitors and the community. The research began with field observations to capture real-time environmental conditions, focusing on water quality and waste management practices. This was followed by in-depth interviews with stakeholders to gather their insights on the environmental challenges posed by tourism. Surveys were then distributed to collect quantitative data on tourist behavior and local community awareness. The study utilized water quality testing kits to measure pH levels and detect pollutants. Structured interview guides were prepared for consistency in qualitative data collection. Surveys were designed with both closed and open-ended questions to provide a comprehensive understanding of respondents' views.

Thematic analysis was applied to qualitative data to identify recurring themes related to environmental issues. Quantitative data were analyzed using descriptive statistics to reveal trends and correlations between tourism activities and environmental impacts. This method ensured that both subjective perceptions and objective environmental indicators were considered (Torresin et al., 2018).

## C. RESULTS AND ANALYSIS

### Negative Impacts of Tourism

Based on observations and interviews with local communities, tourists, and tourist attraction managers, it was found that tourism at Situ Bagendit has several negative impacts on the environment. These impacts are primarily evident in lake water quality, increased waste, and damage to vegetation around tourist areas. The study found that the use of motorized boats and waste discharge from surrounding facilities have significantly reduced water quality. Water samples showed elevated pH levels and high concentrations of pollutants such as nitrates and phosphates, leading to adverse effects on aquatic life. These findings align with observations from other studies indicating that tourism activities can compromise freshwater ecosystems (Buckley, 2012; Alonso-Muñoz et al., 2022). Local farmers corroborated these results, noting decreased crop yields due to using contaminated water for irrigation (Gong et al., 2018).

Survey data revealed that over 80% of tourists admitted to littering, highlighting the need for improved waste management systems. Current efforts to manage waste are insufficient, leading to plastic debris and organic waste accumulating in and around the lake. This issue not only detracts from the area's natural beauty but also endangers local wildlife. Consistent with Renfors (2020), the study found that inadequate waste disposal can severely impact natural habitats and ecosystems.

Tourist area managers acknowledge that the waste collection and disposal systems are not optimal. Plastic waste, including drink bottles, food wrappers, and plastic bags, is frequently found floating on the water's surface or accumulating along the lake's shores. This litter not only detracts from the aesthetic appeal of the tourist area but also poses a significant threat to the local flora and fauna. Non-biodegradable plastic waste endangers aquatic ecosystems and wildlife in the vicinity (Santos et al., 2021).

The development of tourism infrastructure has led to deforestation and habitat destruction, significantly affecting local wildlife. Interviews and field observations pointed to a decline in the number of bird and fish species around Situ Bagendit. These results are in line with findings from Wardani et al. (2023), who noted that poorly managed tourism development often results in habitat loss and reduced biodiversity.

Interviews with local community members and academics indicate that several species of birds and fish that were once common around Situ Bagendit are now increasingly rare. The loss of natural vegetation is a primary factor contributing to the decline in animal populations. Furthermore, management practices that do not adhere to sustainability principles exacerbate the damage to ecosystems and biodiversity (Gustiarini, 2023).

### **Positive Impacts of Tourism**

Despite the environmental challenges posed by tourism at Situ Bagendit, several positive impacts can be identified. One notable benefit is the increased awareness among local communities regarding the importance of environmental protection. Through various educational programs and involvement in conservation activities, many residents have begun to actively participate in efforts to maintain the cleanliness of the lake and its surroundings (Islam, 2024).

Despite the challenges, the research also highlighted positive outcomes, such as increased environmental awareness among residents. Initiatives spearheaded by local governments and NGOs have been effective in educating the community on the importance of environmental conservation. Approximately 60% of local respondents reported that they are more conscious of environmental issues due to these efforts, which aligns with findings by Cardinali et al. (2020).

Some tourism operators have begun to adopt environmentally friendly practices, such as implementing waste processing systems and using non-motorized boats. These measures, although limited in scope, demonstrate potential for more sustainable tourism management. This mirrors initiatives discussed by Gautam (2021), which emphasize the role of sustainable practices in enhancing tourism's long-term benefits.

The results of this study address the initial research questions and objectives outlined in the introduction. The findings confirm that tourism at Situ Bagendit has significant environmental impacts, particularly regarding water pollution, waste management issues, and habitat destruction. These impacts are consistent with previous studies highlighting similar challenges in tourism-dependent regions (Renfors, 2020; Wardani et al., 2023). The positive aspects, such as increased community awareness, suggest that there is potential for sustainable development if appropriate measures are taken.

The decline in water quality and ecosystem health can be attributed to unsustainable tourism practices and insufficient environmental management policies. This aligns with the theory that unchecked tourism growth often leads to resource depletion and environmental harm (Buckley, 2012). However, the emergence of community-driven conservation initiatives provides a foundation for more responsible tourism practices.

The results are consistent with global findings on the negative impacts of tourism on natural environments (Zhu et al., 2019; Alonso-Muñoz et al., 2022). However, the proactive steps taken by some

stakeholders at Situ Bagendit highlight an opportunity to implement best practices from other regions where sustainable tourism has been successfully integrated.

### **Challenges and Opportunities in Tourism Management in Situ Bagendit**

This research identifies several key challenges in managing tourism at Situ Bagendit, including low tourist awareness of environmental protection, inadequate infrastructure supporting sustainable tourism, and weak regulations and enforcement related to environmental conservation. However, significant opportunities exist to enhance environmental management by actively involving local communities, increasing tourist education, and strengthening collaboration between government and the private sector (Zhu et al., 2019).

#### *Challenges in Environmental Management*

Some of the primary challenges in managing tourism at Situ Bagendit include the lack of adequate waste management facilities, insufficient oversight of environmentally damaging tourism activities, and the absence of regulations promoting sustainable tourism practices. For example, the unregulated use of motorized boats continues to contribute to rising water pollution levels (Lovelesh, 2024).

#### *Opportunities for Sustainable Tourism Development*

Despite these challenges, this research identifies substantial opportunities to improve the sustainability of tourism at Situ Bagendit. Initiatives already underway, such as enhanced waste management and environmental education programs, can be expanded to engage more communities and tourists. The development of green infrastructure and the adoption of environmentally friendly technologies also present opportunities to minimize the negative impacts of tourism on the environment (Saarinen, 2013).

#### *Recommendations*

Strengthen environmental regulations by enforce stricter laws to control pollution and manage motorized boat usage. Implement more efficient waste collection and disposal systems, including eco-friendly bins and recycling programs. Develop campaigns to educate tourists and locals about sustainable practices through workshops and social media. Finally, prioritize development that incorporates sustainable technologies and protects natural habitats.

## **D. CONCLUSION**

This research evaluates the impact of tourism on environmental sustainability at Situ Bagendit, a popular natural tourist destination in Garut Regency, West Java. Based on findings from observations, interviews and surveys, it was found that tourism at Situ Bagendit had a significant impact on the environment, both negative and positive impacts.

The negative impact of tourism is mainly seen in the decline in lake water quality due to pollution from domestic waste and the use of motorized boats, an increase in the amount of rubbish, and damage to vegetation around the lake caused by the development of tourist infrastructure. Water pollution in lakes has caused problems for local ecosystems and the lives of communities that depend on lakes for clean water and irrigation. In addition, the increase in the number of tourists has also exacerbated the rubbish problem, with many tourists not adhering to hygiene rules and throwing rubbish carelessly.

However, there are also positive impacts from tourism, especially in terms of increasing local community awareness of the importance of protecting the environment. Several educational programs implemented by local governments and NGOs have helped people become more aware of the importance of environmental conservation, as well as their role in preserving the lake and its

surroundings. In addition, several tourism industry players have begun to adopt sustainability principles, such as using environmentally friendly technology and implementing better waste processing systems.

This research also identifies challenges and opportunities in tourism management in Situ Bagendit. The main challenges faced are the lack of adequate infrastructure to support sustainable tourism, low tourist awareness about the importance of protecting the environment, and weak regulations and law enforcement related to environmental conservation. On the other hand, existing opportunities include increasing the role of local communities in tourism management, developing broader educational programs for tourists, as well as increasing cooperation between government, society and the private sector to create a more sustainable tourism management system.

Based on the results of this research, several recommendations can be proposed to improve the sustainability of tourism in Situ Bagendit. First, there needs to be an effort to strengthen regulations and law enforcement related to environmental management in this tourist area. Second, tourism managers must provide more supporting facilities, such as environmentally friendly trash cans and toilets, as well as improve existing waste processing systems. Third, educational programs for tourists about the importance of protecting the environment must be improved, both through direct campaigns and social media. Lastly, the development of green infrastructure and the application of environmentally friendly technology must be a priority in development planning in this tourist area. By implementing these steps, it is hoped that tourism in Situ Bagendit can develop sustainably without damaging environmental sustainability and providing long-term benefits for the local community.

## REFERENCES

- Alonso-Muñoz, S., Medina-Salgado, M., & González-Sánchez, R. (2022). Sustainability as a building block for tourism – future research: tourism agenda 2030. *Tourism Review*, 78(2), 461-474. <https://doi.org/10.1108/tr-12-2021-0568>
- Buckley, R. (2012). Sustainable tourism: research and reality. *Annals of Tourism Research*, 39(2), 528-546. <https://doi.org/10.1016/j.annals.2012.02.003>
- Cardinali, P., Varani, N., & María, L. (2020). Sustainable tourism attitude and preference in italian adults: value orientation and psychological need satisfaction. *Sustainability*, 12(24), 10517. <https://doi.org/10.3390/su122410517>
- Gautam, B. (2021). Sustainable tourism: conceptual clarity and contextualization in nepal. *Janapriya Journal of Interdisciplinary Studies*, 10(1), 161-167. <https://doi.org/10.3126/jjis.v10i01.42620>
- Gong, J., Detchkhajornjaroensri, P., & Knight, D. (2018). Responsible tourism in bangkok, thailand: resident perceptions of chinese tourist behaviour. *International Journal of Tourism Research*, 21(2), 221-233. <https://doi.org/10.1002/jtr.2256>
- Gustiarini, A. (2023). Sustainable marine tourism of eco resort criteria south waigeo raja ampat islands. *Jurnal Sumberdaya Akuatik Indopasifik*, 7(3), 273-282. <https://doi.org/10.46252/jsai-fpik-unipa.2023.vol.7.no.3.317>
- Islam, M. (2024). Exploring key drivers of tourism sustainability practices and their impact on sustainable competitive performance in the accommodation industry. *International Journal of Business Ecosystem and Strategy*, 6(1), 28-44. <https://doi.org/10.36096/ijbes.v6i1.465>
- Kusumardani, H., Yuwono, T., & Rachmawati, D. (2022). Growth and physiological attributes of rice by the inoculation of osmotolerant rhizobacteria (*enterobacter flavescens*) under drought

- condition. *Journal of Tropical Biodiversity and Biotechnology*, 7(2), 67359. <https://doi.org/10.22146/jtbb.67359>
- Liu, Z. (2003). Sustainable tourism development: a critique. *Journal of Sustainable Tourism*, 11(6), 459-475. <https://doi.org/10.1080/09669580308667216>
- Lovelesh, L. (2024). Modern tourism development with a sustainable tourism approach: a case study on pilgrimage tourism in varanasi. *International Journal of Research in Management*, 6(1), 344-352. <https://doi.org/10.33545/26648792.2024.v6.i1d.165>
- Mrabti, L., & Alaoui, Z. B. (2024). Balancing Qualitative and Quantitative Research Methods: Insights and Applications. In *Data Collection and Analysis in Scientific Qualitative Research* (pp. 87-118). IGI Global.
- Renfors, S. (2020). Stakeholders' perceptions of sustainable tourism development in a cold-water destination: the case of the finnish archipelago. *Tourism Planning & Development*, 18(5), 510-528. <https://doi.org/10.1080/21568316.2020.1816566>
- Saarinen, J. (2013). Critical sustainability: setting the limits to growth and responsibility in tourism. *Sustainability*, 6(1), 1-17. <https://doi.org/10.3390/su6010001>
- Santos, V., Sousa, M., Costa, C., & Au-Yong-Oliveira, M. (2021). Tourism towards sustainability and innovation: a systematic literature review. *Sustainability*, 13(20), 11440. <https://doi.org/10.3390/su132011440>
- Sharpley, R. (2020). Tourism, sustainable development and the theoretical divide: 20 years on. *Journal of Sustainable Tourism*, 28(11), 1932-1946. <https://doi.org/10.1080/09669582.2020.1779732>
- Torresin, S., Pernigotto, G., Cappelletti, F., & Gasparella, A. (2018). Combined effects of environmental factors on human perception and objective performance: A review of experimental laboratory works. *Indoor air*, 28(4), 525-538. <https://doi.org/10.1111/ina.12457>
- Wardani, P., Farhan, M., Destarianto, P., Imam, S., Pertami, R., Brilliantina, A., ... & Samsudin, A. (2023, January). Analysis on the Implementation of Community-Based Tourism in Sidomulyo Tourism Village, Jember Regency. In *Proceedings of the 3rd International Conference on Social Science, Humanity and Public Health, ICoSHIP 2022, 05-06 November 2022, Banyuwangi, East Java, Indonesia*. <https://doi.org/10.4108/eai.5-11-2022.2326516>
- Yasarata, M., Altınay, L., Burns, P., & Okumuş, F. (2010). Politics and sustainable tourism development – can they co-exist? voices from north cyprus. *Tourism Management*, 31(3), 345-356. <https://doi.org/10.1016/j.tourman.2009.03.016>
- Zhu, H., Zhang, J., Yu, X., & Hu, S. (2019). Sustainable tourism development strategies and practices of world heritage sites in china: a case study of mt. huangshan. *International Journal of Sustainable Development and Planning*, 14(4), 297-306. <https://doi.org/10.2495/sdp-v14-n4-297-306>
- Ziaabadi, M., Malakootian, M., Mehrjerdi, M., Jalaei, S., & Boshraabadi, H. (2017). How to use composite indicator and linear programming model for determine sustainable tourism. *Journal of Environmental Health Science and Engineering*, 15(1). <https://doi.org/10.1186/s40201-017-0271-5>