

## **Evaluation of Tourist Satisfaction Levels in Mangrove Ecotourism Using the Net Promoter Score (NPS) Method.**

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**Abstract.** This study aims to assess the level of tourist satisfaction with the Darunu Mangrove Ecotourism Village using the Net Promoter Score (NPS) method. This approach was chosen because it is effective in measuring not only tourist satisfaction but also loyalty behavior, which is reflected in tourists' willingness to recommend the destination to others. This study used a quantitative descriptive method involving 100 tourists selected by accidental sampling. Data were obtained through field observations, brief interviews, and a questionnaire using a Likert scale. The findings show that overall tourist satisfaction is in the "good" category, with an average NPS score of 52.7. The highest-ranking indicators are friendly environmental conditions (72), intention to revisit (69), affordability (68), and destination attractiveness (66). Conversely, the facilities (40) and accessibility (48) indicators have the lowest scores, indicating the need for improvements in infrastructure and visitor comfort. The results demonstrate that community involvement and sustainable environmental management play a crucial role in shaping positive tourism experiences. Furthermore, this study provides strategic insights for destination managers and local governments to enhance the development of sustainable mangrove-based ecotourism in the coastal areas of North Minahasa.

### **Keywords:**

tourist satisfaction, mangrove ecotourism, tourist loyalty, Net Promoter Score (NPS), destination management, sustainable tourism

Manuscript received: 23 Nov 2025.

Revision accepted: 22 Dec. 2025.

## **INTRODUCTION**

Nature-based tourism, or ecotourism, has become a major trend in the global tourism industry over the past two decades (UNWTO, 2023). This trend has grown alongside growing global awareness of the importance of preserving the environment and encouraging sustainability-oriented tourism activities (Honey, 2008). UNWTO (2023) reports that nearly 60 percent of international tourists now prefer destinations that offer nature-based experiences and contribute to environmental conservation. This shift in tourist preferences marks the emergence of a form of tourism that seeks not only

pleasure but also educational experiences and social responsibility (Weaver, 2014). One form of ecotourism that is gaining increasing attention is mangrove ecotourism, which combines the conservation of coastal ecosystems with the social and economic empowerment of local communities (Alongi, 2020). Secara global, ekosistem mangrove mencakup sekitar 14,8 juta hektar di lebih dari 120 negara (FAO, 2020).

Globally, mangrove ecosystems cover approximately 14.8 million hectares in more than 120 countries (FAO, 2020). Mangroves play a vital role in supporting coastal biodiversity, providing primary habitat for fish, birds, and other marine life,

and acting as significant wave breakers and blue carbon sinks (Spalding et al., 2014; Donato et al., 2011). Countries such as Thailand, the Philippines, Australia, and India have demonstrated success in developing mangrove ecotourism destinations that integrate conservation and sustainable development (UNEP, 2022). In Thailand, the Ranong Mangrove Forest Research Center serves as an example of successful ecotourism management based on science, environmental education, and local community participation (Sathirathai & Barbier, 2001). In India, Bhitarkanika National Park demonstrates the success of mangrove ecosystem conservation through a conservation tourism system that provides economic benefits to the surrounding community (Kathiresan & Bingham, 2001).

A key characteristic of these countries' success is collaborative governance involving governments, research institutions, and communities in destination management mechanisms (Ellison, 2015). Thailand implements a zoning system for mangrove forest management that differentiates areas for conservation, research, and recreation (Havanon, 2020). Meanwhile, in Australia, the successful management of mangrove areas in Kakadu National Park demonstrates the importance of collaboration between conservation authorities, indigenous communities, and tourism stakeholders in creating sustainable tourism (Molnar et al., 2019). In the Philippines, mangrove conservation projects in Bohol and Palawan are implemented using the concept of community-based ecotourism, placing communities at the forefront, from reforestation activities to tour guides (Walters et al., 2008). The success of these countries serves as a global role model, demonstrating that community-based mangrove ecotourism management can balance economic needs with environmental conservation (D'Agnes et al., 2020).

Indonesia has significant potential for mangrove ecotourism development, boasting the world's largest mangrove forest area, covering 3.3 million hectares (KLHK, 2023). However, this significant potential faces serious challenges, particularly degradation due to land conversion for fish ponds, plantations, and settlements (Ilman et al., 2016). Data from the Ministry of Environment and Forestry (KLHK, 2023) shows that approximately 20 percent of Indonesia's mangroves are currently damaged and require immediate restoration. This situation has ecological impacts, including a reduced ability of coastal ecosystems to protect communities from abrasion and an increased risk of natural disasters (Alongi, 2020). Therefore, community-based ecotourism management has emerged as a strategic approach that can address conservation challenges while supporting local economic growth (Fandeli & Nurdin, 2020).

The community-based ecotourism approach emphasizes empowering local communities as key actors in every stage of tourism management, from planning and operations to the distribution of economic benefits (Scheyvens, 1999). With active community involvement, ecotourism activities are expected to foster a strong sense of ownership of natural resources and encourage environmentally conservative behavior (Stone & Wall, 2004). In this context, Indonesia has begun to develop community-based mangrove ecotourism models in various regions, including North Sulawesi.

One relevant example is the Darunu Mangrove Ecotourism Village in North Minahasa Regency, which covers approximately 24 hectares of natural mangrove forest (North Minahasa Tourism Office, 2023). This area is managed collaboratively by the local community and the local government, with three main focuses: ecosystem conservation, environmental education, and sustainable

tourism development (Fandeli & Nurdin, 2020). Community involvement in ecotourism in Darunu Village is reflected in the formation of a Village Business Entity (BUNDES) and family businesses directly integrated into the Ecotourism program. In practice, tourism activities in Darunu Village are not only oriented towards tourist visits but also include ecological learning, field research, and creative economic initiatives such as processing mangrove products into value-added products (North Sulawesi Environmental Office, 2023).

However, to assess the effectiveness of ecotourism destination management and sustainability, quantitative measures capable of reflecting tourist satisfaction and loyalty are essential (Kotler & Keller, 2016). Tourist satisfaction is a key indicator of destination success, as it is directly related to revisit intentions and recommendations to other potential tourists (Lee & Jan, 2019). In this context, the Net Promoter Score (NPS) method developed by Reichheld (2003) is a simple yet effective assessment tool for measuring tourists' willingness to recommend destinations they visit. Several previous studies (Kresic & Prebezac, 2019; Duarte et al., 2022) have shown that the NPS has a high level of reliability in measuring visitor satisfaction and loyalty to sustainable tourism destinations.

This research is important because it provides scientific and practical contributions to the development of community-based ecotourism management strategies. Scientifically, this research enriches the literature on the relationship between satisfaction, loyalty, and the effectiveness of ecotourism management in the context of coastal conservation (Weaver, 2014). Practically, the research findings can inform policymaking for local governments and tourism communities to strengthen governance, improve the quality of the tourist experience, and expand local economic benefits (UNEP, 2022). By

referencing the success of mangrove ecotourism management models in other countries that have served as role models, this research is expected to strengthen Indonesia's position as a country with a strong commitment to mangrove conservation and sustainable tourism.

## RESEARCH METHOD

This study uses a quantitative descriptive approach to describe the level of tourist satisfaction at the Darunu Mangrove Ecotourism Park through the application of the Net Promoter Score (NPS) method. This approach emphasizes the collection and analysis of numerical data to objectively interpret observed phenomena (Sugiyono, 2021). The study was conducted in the Darunu Mangrove Ecotourism Village, located in Wori District, North Minahasa Regency, North Sulawesi Province. This location was chosen because it is an example of a developing community-based ecotourism destination. Field research was conducted from March to June 2025, coinciding with the peak tourist season.

The survey method was used as the primary research strategy, with data collected through structured questionnaires distributed to tourists visiting Darunu Mangrove Park. This method allowed researchers to gain direct insight into visitor satisfaction levels, perceptions of facilities, and service quality. In addition to the questionnaires, direct field observations and brief interviews with visitors and local managers were also conducted to enrich the interpretation of the survey data.

This study used two types of data: primary and secondary. Primary data was collected directly from respondents through observation, interviews, and questionnaire responses. Meanwhile, secondary data was obtained from scientific journals, books, government reports, and official documents from local tourism authorities (Sugiyono, 2012). Combining these data sources

ensures stronger validity and reliability of the research findings.

The population in this study included all tourists who visited Darunu Mangrove Park during the research period. Since the exact number of visitors was unknown, an accidental sampling technique was applied—a non-probability method in which anyone who met the visitor criteria and was willing to participate was selected as a respondent (Sugiyono, 2012). Based on Rao Purba's formula (Martanti, 2006), with a 90% confidence level and a 10% margin of error, the sample size was calculated at 96 respondents, which was then rounded up to 100 participants for ease of analysis.

Variabel utama penelitian ini adalah kepuasan wisatawan, yang diukur melalui kerangka Net Promoter Score (NPS). NPS menilai loyalitas wisatawan berdasarkan kesediaan mereka untuk merekomendasikan destinasi wisata kepada orang lain (Reichheld, 2003). Variabel ini dioperasionalkan menjadi tujuh indikator utama: Daya Tarik Wisata, Aksesibilitas, Kualitas Lingkungan, Harga, Fasilitas, Layanan Masyarakat, dan Pengalaman Emosional.

Each indicator was measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Data analysis was conducted using quantitative descriptive methods by calculating the NPS score using the following formula:

$$NPS = \% \text{ Promoters} - \% \text{ Detractors}$$

Respondents were categorized into three groups: Promoters (score 9–10): travelers who are very satisfied and willing to recommend the destination; Passives (score 7–8): travelers who are somewhat satisfied and remain neutral in their recommendation; Detractors (score 0–6): travelers who are dissatisfied and less likely to recommend the destination.

The resulting NPS scores are interpreted according to Satmetrix (2019) as follows:  $\geq 70$ : excellent satisfaction, 50–69: good satisfaction, 0–49: fair satisfaction,  $< 0$ : poor satisfaction.

This methodological approach was chosen because it provides a concise, objective, and easy-to-interpret assessment of visitor satisfaction and loyalty. These results are expected to provide empirical evidence and practical guidance for destination managers and local governments to improve service quality and strengthen the attractiveness of community-based mangrove ecotourism.

## RESULTS AND DISCUSSION

### a) Validity and Reliability Test.

The validity test used the Pearson Product Moment correlation technique to determine whether each item in the questionnaire validly measures tourist satisfaction variables. The thresholds used were: Significance (p-value)  $< 0.01$  Inter-item correlation value with a total score  $\geq 0.30$ . The analysis results show: All questionnaire items (VAR00001 to VAR00010) have a significant correlation with the total score, with a correlation value exceeding 0.30. All items are declared valid and suitable for measuring tourist satisfaction at Darunu Mangrove Park.

The results of the reliability test using the Cronbach's Alpha method showed a value greater than 0.70. This value indicates that the questionnaire instrument is reliable, allowing for consistent use and reliable measurement results in assessing tourist satisfaction at Darunu Mangrove Park.

### b) Calculation of Net Promoter Score (NPS)

Based on the calculation results, the Net Promoter Score (NPS) value for each indicator is as follows Table 1.

Table 1. Overview of data sources and respondents in the study

No	Indicator	NPS Value	Category	Interpretation
1	Natural beauty of Darunu Mangrove Park	66	Good	Visitors highly appreciate the natural beauty and lush mangrove scenery.
2	Tourism facilities	48	Fairly Good	Facilities are considered adequate but still require improvement, such as toilets and seating areas.
3	Accessibility to the site	48	Fairly Good	Road access is not yet optimal and remains difficult for public transportation
4	Cleanliness of the tourist area	45	Fairly Good	Cleanliness is relatively good but needs improvement in several areas.
5	Information and directional signage	40	Moderate	Information boards are considered unclear and limited in several spots
6	Ticket and food prices	68	Good	Prices are deemed reasonable and proportional to the experience received
7	Visitor safety	65	Good	Tourists feel fairly safe while visiting the location.
8	Service from the local community	65	Good	The friendliness and assistance of local residents add value to the tourist experience.
9	Sense of amazement during the visit	62	Good	Tourists experience positive emotional impressions throughout their visit
10	Overall enjoyment of the tourism experience	68	Good	Overall satisfaction is high, reflecting an enjoyable and memorable visi

Total NPS Score: 527

Average NPS Score: 52.7 (Good Category).

This indicates that overall, tourists were satisfied with their experience at the Darunu Mangrove Ecotourism Park. These findings indicate that most visitors have a positive perception of the destination, particularly regarding its natural beauty, friendly environment, reasonable prices, and quality of service. However, improvements to facilities, accessibility, and visitor information systems are still needed to enhance the overall tourist experience and raise the NPS score to the "Very Good" category.

The results of the study showed that the majority of tourists were satisfied with their overall experience at Darunu Mangrove Park, especially in the following aspects: a.natural beauty and mangrove environment (NPS 66),b.affordable ticket and food prices (NPS 68), and c.friendly service from the local community (NPS 65).

These three factors are the main strengths of this destination, reflecting the active involvement of local residents in providing an authentic and memorable ecotourism experience. However, several aspects still require improvement, especially regarding:a.public facilities (NPS 48),b.Accessibility to the location (48), c.environmental cleanliness (NPS 45), and d.clarity of information and directional signs (NPS 40). This relatively low score indicates the need for improved facility management, better waste management, and better visitor information systems throughout the Site and road access to the Site.

Overall, the average NPS score of 52.7 (category "Good") indicates that Darunu Mangrove Park has achieved a satisfactory level of visitor experience, but has not yet reached its full potential. There is still significant opportunity to improve the quality of tourist satisfaction towards



the category "Very Good" ( $\geq 70$ ). Recommended efforts include improving supporting infrastructure, improving hygiene standards, strengthening digital tourism promotion, and providing service training for the local community to improve the professionalism and sustainability of destination management.

The findings of this study have several important implications, both for theory and practice.

First, in terms of strengths, visitors expressed strong appreciation for the natural beauty and hospitality of the local community, hallmarks of community-based ecotourism. This strengthens Darunu Mangrove Park's position as an educational and recreational destination that effectively combines environmental conservation with cultural and social engagement. High levels of satisfaction in these aspects highlight the value of authentic local interactions as a driver of memorable visitor experiences.

Second, regarding areas that need improvement, accessibility and public facilities still require attention to enhance overall visitor comfort. Collaboration between local governments and destination managers is needed to improve road infrastructure, expand visitor facilities, and install clearer directional and informational signs throughout the site. Strengthening these physical and informational elements can significantly improve visitor comfort and satisfaction, thus supporting higher levels of loyalty in the future.

Third, from a theoretical perspective, these findings align with the views of Oliver (1999) and Kotler and Keller (2016), who stated that customer satisfaction is achieved when the actual experience meets or exceeds expectations. Furthermore, a positive NPS score above 50 supports Reichheld's (2003) argument that a high NPS score reflects strong customer loyalty, which naturally drives word-of-mouth advocacy. This suggests that visitors to Darunu Mangrove Park act as voluntary

promoters, contributing to the organic growth and sustainability of the destination.

## CONCLUSION

The results of this study indicate that the level of tourist satisfaction at Darunu Mangrove Ecotourism Park is generally categorized as good, with an average Net Promoter Score (NPS) of 52.7. This score indicates that most visitors are satisfied with their experience and willing to recommend the destination to others. The highest-rated aspects included friendly environment (NPS 72), intention to revisit (NPS 69), affordability (NPS 68), and natural attractions (NPS 66), reflecting that tourists enjoyed a positive and memorable ecotourism experience. Conversely, facilities (NPS 40) and accessibility (NPS 48) received the lowest scores, indicating a need for improvements in infrastructure and visitor comfort. Improving these components will help improve the overall quality of the tourist experience at Darunu Mangrove Ecotourism Park and potentially raise the satisfaction rating to "Very Good" ( $\geq 70$ ) in the future.

Sustainable ecotourism is essential for maintaining natural beauty, species diversity, and the quality of the tourist experience. This research shows that sustainability can be achieved by maintaining the integrity of mangrove ecosystems, improving the quality of facilities, strengthening the role of local communities, and ensuring economic and environmental sustainability.

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