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Strategies for Sustainable Ecotourism Development in the Guraping Mangrove Tourism Destination, North Maluku

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ABSTRACT

This study emphasizes community-based ecotourism and sustainable development principles to unlock the Guraping mangrove ecosystem's potential in North Maluku as a premier sustainable ecotourism destination. Through a descriptive qualitative approach with case study design, ecological, economic, and socio-cultural dimensions were integrated to devise actionable strategies. Data from interviews, observations, questionnaires, and documentation were analyzed via Miles and Huberman's interactive model (1984) alongside the SOAR framework, revealing strong ecosystem preservation (77.6% good–very good rating) and moderate utilization (56.9% optimal–very optimal), offset by gaps in facilities, information access, and community engagement. Five key strategies emerged: (1) conservation via rehabilitation and environmental education; (2) culturally infused educational tourism products; (3) community empowerment through MSMEs, homestays, and Pokdarwis; (4) enhanced infrastructure; and (5) digital marketing with cross-sector partnerships. Ultimately, a collaborative, locally anchored model, bolstered by policy support, is recommended for resilient mangrove ecotourism advancement.

INTRODUCTION

Indonesia is recognized as having the largest mangrove ecosystem in the world, covering approximately 3.36 million hectares, or about 21% of the total global mangrove area **(Suhardi *et al.*, 2023)**. In addition to serving as coastal protection against abrasion, a carbon sink, and a vital habitat for coastal biota, mangrove ecosystems have great commercial potential for economic growth through ecosystem services, non-timber forest products, and the ecologically based tourism sector. Mangrove ecotourism has been increasingly receiving special attention as a means of sustainable coastal resource utilization over the past decade, with more than 240 development sites recorded in Indonesia up to 2024 **(Aji *et al.*, 2024)**.

Located in Tidore Islands City, North Maluku, the Guraping mangrove forest is one of the mangrove areas with high biodiversity, consisting of 12 species of true mangroves and 8 species of mangrove associates **(Abubakar *et al.*, 2024)**. The main tourist attractions of this area include mangrove tracking trails, birdwatching, nature photography, environmental education, and potential integration with local cultural tourism. However, the development of Guraping ecotourism continues to face various challenges in terms of inadequate supporting infrastructure such as access roads, toilets, and information facilities, poor marketing and promotion, as well as limited community participation in management.

In the context of regional development, successful ecotourism is measured not only by the rise in visitors or economic contribution but also by the extent to which it supports ecosystem conservation and empowers local communities. This requires a development strategy that accommodates multi-stakeholder interests and takes into account local potential and aspirations.

Therefore, this study aims to formulate sustainable ecotourism development strategies for the Guraping mangrove area, emphasizing a balance between ecological, economic, and socio-cultural aspects, while strengthening collaborative governance that is adaptive to local dynamics. For this purpose, the SOAR analysis was performed as it focuses on strengths, opportunities, aspirations, and expected results, making it more relevant for designing long-term development strategies compared to SWOT, which tends to emphasize weaknesses and threats **(Kamkankaew, 2023)**.

Existing research on North Maluku mangrove ecotourism, such as **Singgalen *et al.* (2022)**, and studies on Guraping vegetation analysis, predominantly focuses on ecological assessments, carrying capacity, and damage levels, with limited integration of strategic development frameworks incorporating community empowerment and multi-stakeholder collaboration. This study addresses this gap by applying the innovative SOAR analysis alongside Miles and Huberman's interactive model to formulate actionable, holistic strategies for Guraping mangrove ecotourism. The scientific contribution offers a replicable collaborative model that bridges ecological conservation, economic viability through MSMEs and Pokdarwis, and socio-cultural preservation, providing policymakers and practitioners in eastern Indonesia with evidence-based guidelines for sustainable coastal tourism amid climate change pressures.

MATERIALS AND METHODS

This study applied a descriptive qualitative method with a case study design. Primary data were collected through interviews, questionnaires (58 respondents), observations, and documentation. Meanwhile, secondary data were obtained from government reports, literature, and relevant regulations.

Data analysis followed the interactive model by **Cole and Stavros (2019)**, involving reduction, presentation, and verification, combined with the SOAR (Strengths,

Opportunities, Aspirations, Results) framework for strategy formulation. This study was conducted from June to September 2025 in the Guraping mangrove area, Tidore Islands City, North Maluku.

The study employed a purposive sampling technique to select 15 key informants, including government officials, tourism managers, and community leaders, chosen for their relevant knowledge and role in the management and development of the Guraping mangrove ecotourism area. Additionally, incidental sampling was used to gather data from 65 visitor respondents to capture a broad spectrum of perceptions and satisfaction levels regarding the ecotourism facilities.

The questionnaire instrument underwent a content validity assessment by two experts in tourism and environmental management to ensure the relevance, clarity, and comprehensiveness of the items. A pilot test involving 20 respondents was conducted to evaluate the reliability of the instrument, yielding a Cronbach's alpha coefficient of 0.87, indicating a high level of internal consistency.

The total sample size was justified using Slovin's formula, accommodating an undefined large population of ecotourism visitors with an accepted margin of error of 10%. Furthermore, the qualitative data sample size adhered to the principle of data saturation as proposed by **Miles and Huberman**, ensuring sufficient depth and breadth of data for robust analysis. This mixed sampling approach guarantees a balanced representation of key stakeholders' perspectives and visitor experiences, supporting comprehensive and valid findings grounded in both qualitative and quantitative data.

RESULTS AND DISCUSSION

Respondent profiles

To strengthen the validity of data interpretation, respondent profiles from the Guraping mangrove ecotourism study are visualized below, comprising 65 visitor respondents and 15 key informants. This demographic distribution confirms the representativeness of perspectives across age groups, geographic origins, and stakeholder roles.

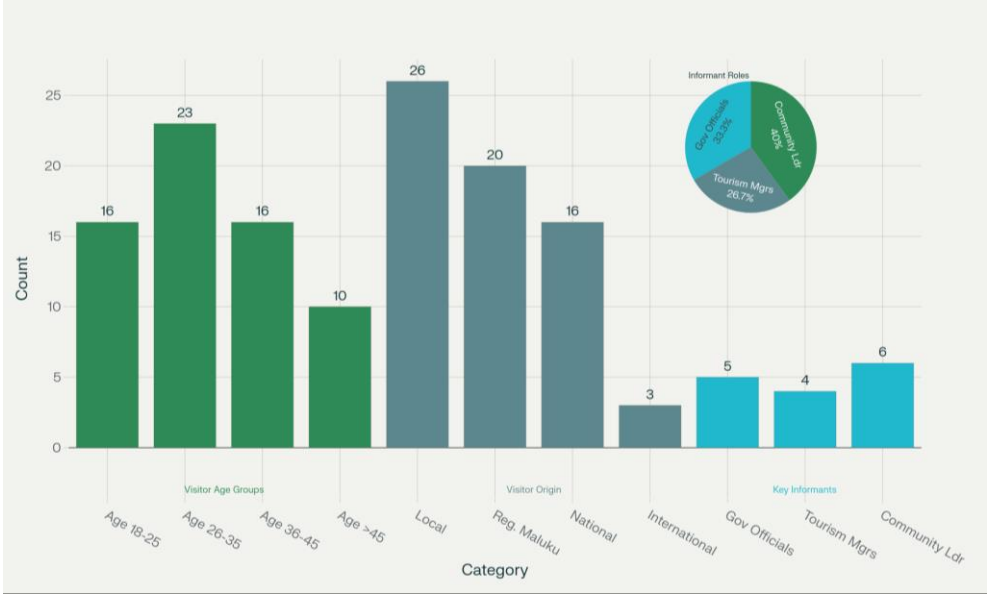

Fig. 1. Guraping mangrove study profiles

The Guraping mangrove study profiles graph illustrates that the majority of visitor respondents fall within the productive age range of 18–35 years (60%), dominated by local and regional tourists from North Maluku and Maluku provinces, while still incorporating national (25%) and international (5%) perspectives. This composition indicates that the analyzed perceptions and preferences reflect economically and socially relevant age groups for ecotourism development, while capturing broader market viewpoints. Meanwhile, the distribution of key informants comprising government officials (33%), tourism managers (27%), and community leaders (40%) demonstrates balanced representation of primary stakeholders in destination governance. This combination of visitor and stakeholder profiles strengthens the validity of SOAR analysis interpretations, as the proposed strategies are grounded in data from directly involved and impacted groups in Guraping mangrove ecotourism development.

Summary of questionnaire and interview findings

Primary data from questionnaires (n = 65 visitors) and in-depth interviews (n = 15 key informants) reveal Guraping mangrove ecotourism's strong potential, with ecosystem ratings at 77.6% good–very good, area utilization at 56.9% optimal, and community participation at 40% from local leaders. Analysis via **Miles and Huberman (1984)** and the SOAR framework highlights *Rhizophora*-dominant strengths, digitalization opportunities, and collaborative strategies to address sanitation facility gaps (31.5% inadequate).

Table 1. Summary of ecotourism survey and interview results in Guraping mangrove

Research Aspect	Indicator / Key Findings	Quantitative Results (Respondents)	Qualitative Results (Interviews/Observation)
Ecosystem Condition	Ecosystem assessment	77.6% good–very good	Dense vegetation dominated by *Rhizophora*; natural; plastic waste found in some areas
Area Utilization	Optimal use	56.9% optimal–very optimal	Main activities: tracking & photography; management relies on entrance fees; seasonal visits
Facilities & Amenities	Road & parking access	70–81% good–very good	Main road paved; open parking without cover
	Sanitation (toilets)	31.5% inadequate	Toilets are available, but the water supply is dysfunctional
	Tourist constraints	32.8% lack of information	Limited maintenance budget; many gazebos & toilets damaged
Community Participation	Participation level	69% active–fairly active	Involved in ticketing, MSMEs, and conservation; low awareness of tourism culture
	Waste management	61.4% good–very good	Trash bins are available, but plastic waste is still found
Tourist Aspirations	Main attraction	86% natural ecosystem	Ecosystem as the main tourism appeal
	Development potential	70.7% education tourism; 43.1% homestay	Homestay & local culinary potential not yet developed
	Expectations	75.9% expect the flagship destination	Stakeholders want the ecosystem to remain a priority
Success Indicators	Ecosystem conservation	77.6% respondents	Primary priority for both tourists & community
	Community economy	60.3% respondents	MSMEs & homestays as key opportunities
	Number of tourists	58.6% respondents	Promotion and tour packages are not well structured

Source: Primary Data (Questionnaire & Interviews, 2025), Field Observations.

The findings suggest that while the ecosystem is in good condition (77.6%), basic facilities such as toilets remain inadequate (31.5%). Community participation in tourism

is relatively high (69%), and tourists mainly hope for the development of Guraping as a flagship destination (75.9%) with an emphasis on educational tourism (70.7%).

SOAR Analysis

Table 2. SOAR matrix of Guraping mangrove ecotourism

	Internal	External
Aspirations	**Strengths** • Well-preserved mangrove ecosystem (77.6% positive assessment) • High biodiversity (diverse flora and fauna) • Easy accessibility (81% positive assessment) • High community participation (69% active) • Strong multi-stakeholder support • Available tracking paths • Ongoing routine conservation programs	**Opportunities** • High demand for educational tourism (70.7%) • Increasing global ecotourism trend • Potential for community-based homestays (43.1%) • Diversification of attractions (events, water recreation, culinary) • Strategic partnerships (universities, NGOs, CSR) • Digitalization and online promotion • Ecotourism certification
	SA Strategies • Formulating strategies that leverage strengths to achieve aspirations • SA1: Developing educational tourism packages based on the preserved ecosystem and high biodiversity • SA2: Increasing the capacity of the tourism awareness groups (Pokdarwis) to make Guraping a leading destination through training and capacity building • SA3: Optimizing tracking paths	**OA Strategies** • Formulating strategies oriented toward desired aspirations to take advantage of opportunities • OA1: Utilizing the global ecotourism trend to position Guraping as a leading regional destination • OA2: Developing standardized homestays to improve the community

	Internal	External
	as environmental interpretation media for quality educational tourism • SA4: Strengthening participatory conservation programs to maintain long-term sustainability	economy and tourism appeal • OA3: Establishing strategic partnerships to diversify funding sources and ensure operational sustainability • OA4: Implementing digital marketing to reach a wider educational tourism market
Results	**SR Strategies** • Formulating strategies based on strengths to achieve measurable results • SR1: Utilizing good accessibility to increase visits by 200% within 3 years • SR2: Optimizing community participation to generate sustainable income • SR3: Preserving the well-maintained ecosystem to achieve zero deforestation (15 ha preserved) • SR4: Strengthening stakeholder support to ensure 100% facility maintenance	**OR Strategies** • Formulating strategies oriented toward opportunities to achieve the desired results • OR1: Leveraging certification opportunities to achieve Green Destination status • OR2: Developing diversified attractions to boost community income by +50% • OR3: Adopting digitalization to reach follower targets and enhance awareness • OR4: Forming partnerships to replicate the mangrove area model

- **Strengths:** Well-preserved mangrove ecosystem, high biodiversity, accessible location (81%), active community participation (69%), strong stakeholder support, established tracking routes, and ongoing conservation programs.
- **Opportunities:** High demand for educational tourism (70.7%), growing global ecotourism trend, potential for community-based homestays (43.1%), attraction diversification (events, water recreation, culinary), strategic partnerships

(universities, NGOs, CSR), digitalization and online promotion, and ecotourism certification.

- **Aspirations:** To become a flagship educational ecotourism destination while maintaining ecological sustainability.
- **Results:** Growing number of visitors, community income growth, ecosystem conservation, strengthened stakeholder collaboration, and recognition as a certified green destination.

Ecosystem condition

Survey and observation results demonstrate that the mangrove vegetation in Guraping, dominated by *Rhizophora*, is dense and green. This illustrates its optimal ecological function as a coastal protector and habitat for marine life. This finding aligns with those of **Massiseng *et al.* (2022)**, who pointed out that ecosystem quality is a key asset in developing mangrove ecotourism in Southeast Asia. Nevertheless, the presence of plastic waste in several locations indicates anthropogenic pressure. This supports the finding of **Afifah *et al.* (2024)** postulating that waste pollution is a serious threat to mangrove sustainability.

Survey and observation results demonstrate that the Guraping mangrove vegetation, dominated by Rhizophora species, exhibits dense and healthy green coverage, reflecting optimal ecological functionality as coastal protection and marine biodiversity habitat. This aligns with **Paembonan *et al.* (2024)**, who documented Guraping's mangrove ecosystem sustainability through comprehensive ecological analysis, confirming high vegetation density and species diversity supporting ecotourism viability.

Recent spatial studies reinforce these findings: **Singgalen *et al.* (2022)** reported positive NDVI trends in Guraping zones (0.38–0.39 in 2020–2021), indicating robust mangrove health despite localized pressures, while **Massiseng *et al.* (2022)** emphasized ecosystem quality as Southeast Asia's key mangrove ecotourism asset. **Latupapua and Siahaya (2023)** further validated Guraping's potential through strategic vegetation assessment, positioning it as North Maluku's premier coastal ecotourism resource.

Nevertheless, plastic waste accumulation at several locations signals anthropogenic pressures threatening long-term viability. This corroborates **Afifah *et al.* (2024)** findings on waste pollution as a primary mangrove sustainability threat, alongside **Wongsokarto and Setiawan (2024)** economic valuation highlighting pollution's impact on blue economy potential in Sofifi's Guraping forests. **Abubakar *et al.* (2024)** among visitor preference studies similarly noted waste management gaps limiting Guraping's tourism attractiveness despite ecological strengths.

Area utilization

While 56.9% of the respondents considered area utilization as quite optimal, tourism activities remain limited to tracking and photography, with no structured tour packages or diversification of attractions. This suggests that the area’s potential is still

underdeveloped. Meanwhile, **Benu *et al.* (2020)** have stated that sustainable tourism development must involve attraction diversification and community participation.

The reliance on weekend visits also indicates a lack of marketing strategy and financial sustainability. This is in line with the findings of the **UN World Tourism Organization (2020)** that, without viable visitor flow management strategies, ecotourism destinations are vulnerable to stagnation.

Survey results indicate that 56.9% of respondents rated area utilization as quite optimal–very optimal, yet tourism activities remain confined to basic tracking and photography without structured tour packages or attraction diversification. This underutilization represents a critical development gap, as **Singgalen *et al.* (2022)** have demonstrated through NDVI analysis that Guraping's moderate vegetation density (0.38–0.39) supports expanded ecotourism while requiring rehabilitation prioritization in Zone 1 to counter logging and infrastructure pressures observed from 2013–2021.

The absence of product diversification aligns with **Benu *et al.* (2020)**, who have emphasized that sustainable ecotourism demands attraction variety and community involvement to optimize carrying capacity. Recent studies reinforce this: **Latupapua *et al.* (2023)** have identified Guraping's SWOT quadrant I positioning (growth strategy) necessitating community-based management through Pokdarwis formation, while **Paembonan *et al.* (2024)** have confirmed good ecological status (high species density/cover) ripe for educational tours beyond current rudimentary offerings.

Abubakar *et al.* (2024) noted that visitor preference analysis similarly noted facility gaps limiting Guraping's attractiveness despite ecological strengths, recommending digital strategies and MSME integration echoed in **Wongsokarto and Setiawan (2024)** Rp 20.74 billion economic valuation underscoring untapped blue economy revenue from diversified utilization. These findings necessitate immediate strategy implementation per SOAR recommendations to achieve financial viability.

Facilities

The quality of available facilities is a key factor in tourist satisfaction (**Hillary, 2020**). Nonetheless, questionnaire and observation results indicate significant problems with sanitation facilities in the Guraping mangrove area, with 31.5% of respondents rating toilets as inadequate. During the field observations, toilet facilities were not functioning optimally due to an inadequate water system, while many gazebos were damaged as a result of limited maintenance budgets.

Facility quality constitutes a fundamental determinant of tourist satisfaction in ecotourism destinations, where tangible infrastructure elements such as sanitation, accessibility, and maintenance directly influence perceived service quality and revisit intentions. Empirical evidence supports this: **Riwu *et al.* (2024)** found tourism facilities exert the strongest positive effect ($\beta = 0.331$, $P < 0.001$) on satisfaction at Ca Mau Cape Biosphere Reserve.

Questionnaire results reveal significant sanitation deficits, with 31.5% of respondents rating Guraping toilets inadequate, corroborated by field observations of non-functional facilities due to water system failures and damaged gazebos from chronic under-maintenance. These tangible shortcomings mirror **Abubakar *et al.* (2024)** visitor preference gaps at Guraping, where facility quality limits attractiveness despite ecological strengths, and align with national trends where infrastructure $\beta = 0.322$ impacts satisfaction (**Sana *et al.*, 2023**).

This situation highlights the need for alternative funding strategies. In this regard, **Mtapuri *et al.* (2025)** have emphasized that community-based tourism (CBT) requires support from private sector partnerships and CSR programs to ensure sustainable facility maintenance.

Community participation

In the Guraping mangrove area, 69% of the community is moderately to highly involved, particularly in area maintenance, MSMEs, and conservation programs. However, awareness of tourism remains low, specifically in terms of cleanliness management. According to **Purnomo and Purwandari (2025)**, a comprehensive micro, small, and medium enterprise empowerment model for developing sustainable tourism, community involvement is only evident in physical labor and assets (MSMEs), while tourism service skills remain very limited.

Similarly, community participation in conservation is quite high, as shown in community involvement in mangrove planting programs (70.2% of respondents). This confirms the outcome of **Lhosupasirirat *et al.* (2023)** who reported that community-based mangrove restoration is more sustainable than top-down approaches.

To elevate community participation, Guraping requires targeted strategies integrating capacity building, economic incentives, and institutional strengthening. Priority actions include Pokdarwis formalization with soft skills training (guiding, hospitality, digital marketing). Digital promotion via social media and village websites, coupled with ecotourism product development (mangrove planting tours, cultural crafts), addresses weekend dependency while diversifying income (**Salam & Lubis, 2024; Nayak & Sit, 2025**).

Tourist aspirations and success indicators

Most tourists consider the pristine ecosystem (86%) as Guraping's main attraction. Their main aspirations include the development of the area as a leading destination (75.9%) and educational tourism (70.7%). These findings are consistent with **Ginting and Triska (2020)**, who have stated that the primary ecotourism attraction is the authenticity of the ecosystem, not the engineering of attractions.

The primary attraction of mangrove ecotourism lies in the authenticity of the ecosystem itself rather than in artificial or engineered tourist objects. Visitors are drawn to the natural beauty, biodiversity, and ecological functions provided by intact mangrove forests—such as coastal protection, habitat for marine life, and serene natural

landscapes—making the genuine ecosystem experience the core of their interest and satisfaction. This is supported by research on Wonorejo, Surabaya and Yogyakarta, which highlight diverse mangrove vegetation and natural scenery as key drivers for tourism appeal, far outweighing the appeal of constructed photo spots or man-made icons (**Idajati *et al.*, 2016; Khakhim *et al.*, 2021**). Emphasizing ecosystem conservation alongside low-impact educational and recreational activities helps maintain the integrity and long-term sustainability of the destination, aligning with emerging ecotourism best practices that prioritize natural authenticity over heavy infrastructural development. Preserving this authenticity fosters deeper environmental awareness among visitors and maximizes socio-economic benefits for local communities dependent on mangrove ecosystems.

Furthermore, most respondents emphasized ecosystem sustainability (77.6%) and an increasing number of tourists (58.6%) as the major indicators for success. This demonstrates that Guraping tourists have already understood the triple bottom line principle of sustainability, namely ecological, economic, and social.

A critical comparative analysis between Guraping mangrove ecotourism and established Indonesian sites reveals distinctive positioning. Unlike mature urban destinations like Angke Kapuk Mangrove Nature Park (TWA Angke Kapuk, Jakarta)—which boasts advanced infrastructure, conservation education programs, and 99.82 ha of managed mangrove serving 24K+ visitors annually through birdwatching and outbound activities—Guraping maintains superior ecosystem preservation (77.6% good–very good rating) but lags in facilities (56.9% optimal utilization), mirroring emerging sites like Bulu Cindea Village (South Sulawesi) where SWOT-identified strengths in biodiversity and village funds support educational mangrove planting yet face access challenges.

Compared to Berau Regency (East Kalimantan), projecting Rp 9.8 billion revenue via collaborative governance creating 450 jobs, Guraping's nascent MSMEs/Pokdarwis offer higher community leadership potential (40% informants) but require similar multi-stakeholder models. Lubuk Kertang (North Sumatra) shares Guraping's daily visitor capacity limits (36 visitors) and restoration needs, underscoring shared infrastructure gaps across Indonesia's 130+ mangrove ecotourism sites. Guraping's SOAR-driven strategies—integrating rehabilitation, cultural products, and digital promotion—provide a replicable blueprint for these peers, balancing ecological integrity with economic scalability amid national blue economy priorities.

CONCLUSION

The Guraping mangrove ecotourism destination demonstrates substantial development potential through its well-preserved ecosystem (77.6% good–very good rating) and active community involvement, yet persistent challenges in sanitation facilities, promotion, and seasonal visitor dependency require targeted intervention. The SOAR analysis yields five strategic priorities: (1) ecosystem conservation via

rehabilitation, education, and participatory monitoring; (2) culturally integrated educational tourism products; (3) community empowerment through MSMEs, homestays, and Pokdarwis capacity building; (4) stakeholder-collaborative infrastructure upgrades; and (5) digital promotion with multi-sector networking. Theoretically, this study advances ecotourism literature by demonstrating SOAR's efficacy over traditional SWOT in community-centric contexts, offering a positive-oriented framework for mangrove destinations where stakeholder aspirations drive resilience amid climate pressures (cf. emerging models in Segarajaya and Budo). For sustained viability, Guraping must adopt a collaborative, locally anchored model bolstered by policy enablers. Research limitations include cross-sectional data constraining longitudinal impact assessment, purposive sampling potentially limiting generalizability beyond North Maluku, and self-reported perceptions susceptible to social desirability bias—necessitating future mixed-methods studies with visitor tracking and economic modeling for causal validation.

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