



Strategies for the Development of Sustainable Tourism Potential in Puncak Dunu, North Gorontalo

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Abstract. *Puncak Dunu nature tourism in North Gorontalo Regency has strong potential for local economic development but has not been managed optimally or sustainably. This study aims to analyze destination conditions based on the 5A components, examine tourists' perceptions, and formulate sustainable development strategies. A mixed-methods approach was applied using field observations, questionnaires to 100 respondents, and in-depth interviews with key stakeholders. The results show that natural attractions and special-interest activities are the main strengths, while amenities, accessibility, and ancillary services remain limited. Tourist perceptions are generally positive, yet revisit intention is low, with 52 percent of visitors visiting only once. SWOT analysis through IFAS and EFAS places Puncak Dunu in Quadrant I, indicating that an aggressive Strength–Opportunity strategy supported by a master plan is required for sustainable destination management.*

Keywords: *Nature Tourism, Tourist Perception, SWOT, IFAS–EFAS, Master Plan*

1. Introduction

The global tourism sector is currently undergoing a fundamental post-pandemic transformation toward a more sustainable and high-quality development model. The United Nations World Tourism Organization (UNWTO) emphasizes that global tourism development is now focused on minimizing negative environmental impacts while maximizing economic benefits for local communities (1). This shift is driving a shift in tourist preferences from mass tourism to more personalized nature and adventure tourism. Failure to integrate sustainability principles from the outset risks the degradation of ecosystems, which are tourism's primary assets.

At the national level, tourism is positioned as a strategic sector within the Gross Domestic Product (GDP) structure and a source of foreign exchange. The Central Statistics Agency of the Republic of Indonesia noted that in 2024, national tourism will begin to enter a consistent recovery phase, marked by a significant increase in domestic tourist mobility (2). The direction of national tourism development policy emphasizes the development of destinations based on environmental conservation and the strengthening of local culture, especially for regions still in the early stages of development to ensure that sustainability principles are not neglected early on.

At the regional level, the Central Statistics Agency of Gorontalo Province shows that the economic growth of Gorontalo Province increased from -0.02% in 2020 to 4.75% in 2024,

along with the increase in the number of tourist visits from 145,230 people in 2020 to 410,200 people in 2023 (3). North Gorontalo Regency, with an area of 1,777 km², a population of 131,250 people, and a coastline of 317 km, has great potential for the development of natural and special interest tourism (4).

One of the emerging tourist destinations in this region is Puncak Dunu, located in Dunu Village, North Gorontalo Regency. This destination offers a combination of hilly landscapes, paragliding activities, and panoramic ocean views. According to data from the North Gorontalo Regency Tourism and Culture Office, Puncak Dunu experienced a surge in visits at the beginning of its inauguration in 2023 with a total of 2,407 tourists, but experienced a sharp decline in the following months due to limited permanent supporting facilities (5). This fluctuating visitation pattern demonstrates the unpreparedness of destination components to support sustainable tourism development.

Sociologically, Puncak Dunu's transformation from agricultural land to a tourist destination raises both economic hopes and social challenges. In the pilot phase, tourism has the potential to trigger social vulnerability if not managed in a participatory manner (6). This finding is reinforced by the assertion that tourism penetration into rural areas triggers a process of acculturation and significant changes in community behavior (7). This demonstrates that the unequal distribution of economic benefits has the potential to cause social jealousy and weaken local community cohesion (8).

The physical condition of Puncak Dunu also still faces limitations in terms of accessibility and amenities. Referring to the theory of tourism destination components, the absence of standardized amenities and supporting facilities causes the tourism economic value chain to not be fully formed (9). Based on the existing research gap, there are still limited studies that integrate analysis of physical potential, community social readiness, and tourism destination management strategies in the pilot phase. Therefore, this study focuses on the analysis of the 5A destination components, tourist perceptions, and the formulation of sustainable nature tourism development strategies at Puncak Dunu.

2. Methods

2.1 Research Approach

This study used mixed methods with an exploratory sequential design, as the aim of the study was to understand the contextual development of Puncak Dunu nature tourism and develop strategies based on empirical conditions, rather than to test causal relationships between variables. The first stage prioritized qualitative data through observation and interviews to capture destination conditions, management practices, and social and institutional dynamics. The next stage used limited quantitative data through a tourist perception questionnaire analyzed using descriptive statistics. The results were integrated at the interpretation stage to identify internal and external factors, then formulated into strategies using IFAS–EFAS and SWOT. This approach allows for comprehensive and applicable findings and recommendations. (Creswell & Creswell) (1); (Sugiyono) (2); (Tashakkori & Teddlie) (3).

2.2 Location and Time Research

The research was conducted at the Puncak Dunu natural tourist destination, located in Dunu Village, Monano District, North Gorontalo Regency, Gorontalo Province. The

location was chosen because Puncak Dunu is a pioneering destination with high potential for attraction, but still faces limitations in management, facilities, and institutional aspects.

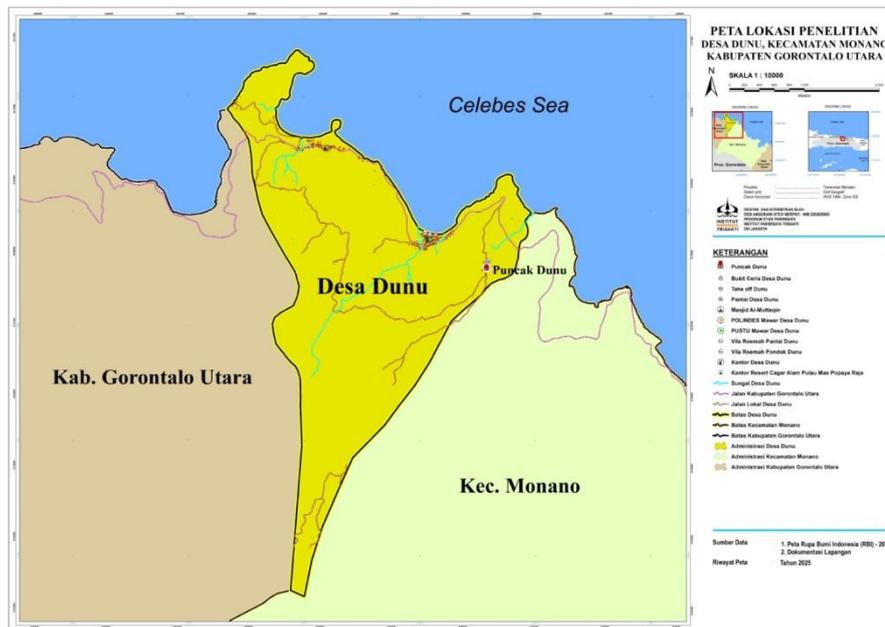


Figure 1. Map of Research Location in Dunu Village, Monano District, North Gorontalo Regency

Source: ArcGIS processing results, 2025

The location map shows the position of Dunu Village and the Puncak Dunu area within the Monano District, including the main road network connecting the village with the surrounding areas. In terms of accessibility, Dunu Village is approximately 27.6 km from the capital of Monano District, approximately 42.7 km from the capital of North Gorontalo Regency, and approximately 94 km from the capital of Gorontalo Province. The research was conducted in 2024, encompassing the preparation phase, field data collection, data processing and analysis, and report preparation, following the monthly work plan outlined in the research document.

2.3 Data Source

The data sources consist of primary and secondary data. Primary data were obtained from field observations, in-depth interviews with local stakeholders, and tourist perception questionnaires. Secondary data came from official government documents, reports from relevant agencies, statistical data, and scientific literature relevant to sustainable tourism, destination components (5As), tourism sociology, and strategic analysis. This combination of sources was used to strengthen the depth of analysis and the validity of the findings. (Creswell & Creswell) (1).

2.4 Data Collection Technique

Data collection techniques include: (1) observation to capture the actual conditions of the destination, facilities, tourist activities, accessibility, and environmental context; (2) in-depth interviews to explore the experiences, views, and management practices of local actors; (3) questionnaires for tourists to obtain structured perception data; and (4) documentation to

strengthen field evidence. Qualitative informants were determined purposively and developed through snowball sampling based on direct involvement in the management and utilization of Puncak Dunu. Tourist respondents were also determined through snowball sampling because there was no definite tourist sampling framework available at the pilot destination. (Sugiyono) (2); (Taherdoost) (4).

2.5 Data Interpretation and Analysis Techniques

Data analysis was conducted in stages and integrated. Qualitative data from observations and interviews were analyzed descriptively and qualitatively to develop a destination profile based on the 5A components and to understand the social, institutional, and environmental contexts. Quantitative data from questionnaires were analyzed using descriptive statistics (frequency, percentage, and mean value) with the help of SPSS, and validity and reliability tests were conducted to ensure the instrument's suitability. The interpretation stage combined qualitative and quantitative findings, then used to develop IFAS (strengths-weaknesses) and EFAS (opportunities-threats). The IFAS-EFAS results were then synthesized in a SWOT matrix to produce alternative development strategies (SO, WO, ST, WT) that were contextual and applicable for Puncak Dunu. Data validity was maintained through triangulation of sources and methods by comparing the results of observations, interviews, and questionnaires. (Creswell & Creswell) (1); (Tashakkori & Teddlie) (3).

3. Results and Discussion

Field findings indicate that Puncak Dunu's natural tourism potential has not been optimally utilized due to undirected destination management and the lack of a master plan. An interview with the Head of the North Gorontalo Regency Tourism Office on January 19, 2023, confirmed the local government's commitment to developing Puncak Dunu as an ecotourism destination. However, in the initial stages, management remains transitional, conducted through collaboration between the village government and the Tourism Awareness Group (Pokdarwis), without adequate institutional strengthening and long-term planning..

3.1. Condition of Tourist Destinations Based on Component 5A

1) Attractions

Puncak Dunu's main attraction is its hilly landscape with panoramic views of the open sea and its biodiversity potential, which supports special interest tourism. Local cultural attractions such as Momonto, Modutu, Molontalo, Tonalo, and Molalunga further enhance the destination's appeal. Since its inauguration in May 2023, special interest attractions have expanded to include paragliding and camping.



Figure 2. Paragliding Attraction at Puncak Dunu, North Gorontalo Regency
Source: Septian (2023)

Paragliding offers a unique attraction, but its implementation is still seasonal and dependent on weather conditions. Furthermore, the takeoff and landing areas are not fully designed to meet safety standards. Interviews revealed the presence of vegetation, such as trees and bushes, on several routes, potentially compromising flight safety. This situation highlights the need for more planned area planning as part of the development of safe and sustainable tourist attractions.



Figure 3. Panorama of afternoon camping at Puncak Dunu Regency
Source:(2023 researcher survey documentation results)

This condition shows that the power of attractions has not been followed by a safe and standardized attraction management system, even though attractions are the main element in shaping the tourist experience (1,2).

2) Amenities

Amenities in the Puncak Dunu area are still limited. Basic facilities like toilets, clean water, and food stalls are inadequate, thus suboptimal tourist comfort. On the other hand, there are locally-based amenities, such as the Roemah Pantai Dunu Homestay, which demonstrates community participation in supporting tourism.



Figure 4. Panorama of afternoon camping at Puncak Dunu Regency
Source:(2023 researcher survey documentation results)

This homestay is located approximately 2.1 km from the Puncak Dunu area and offers relatively complete accommodation facilities with panoramic beach views. The presence of these locally based amenities has the potential to extend tourists' stays, but still requires standardization of services and integration with the destination management system to support sustainable tourism visits (3).

3) Accessibility

Access to Puncak Dunu still relies on private vehicles, as regular public transportation is not yet available. The road to the tourist area is about one kilometer from the main road, but the road is relatively narrow, allowing only one vehicle to pass at a time.



Figure 5. Road Access to Puncak Dunu Location
Source:(2023 researcher survey documentation results)

Road repairs are still being carried out independently by the community and are not yet permanent, thus potentially reducing the comfort and safety of tourists, especially during the rainy season.



Figure 6. Road maintenance activities carried out by local communities
Source:(2023 researcher survey documentation results)

In addition to the physical aspects of roads, limited accessibility is also evident in the lack of tourist information, such as maps, brochures, and official digital media, as well as the limited foreign language skills of local residents. Limited accessibility is a common obstacle in the development of rural tourist destinations, even though they have high natural attractions (4).

4) Ancillary

Additional services in the Puncak Dunu area still show various limitations. The destination lacks professional tour guides, tour packages are unstructured, information services are not centralized, security systems are not organized, and travel insurance schemes are not yet available. These conditions impact tourists' educational experiences and increase the risks during their travels.



Figure 7. Density of community and tourist activities at Puncak Dunu
Source:(2023 researcher survey documentation results)

The ancillary component plays an important role in determining the readiness of governance and the quality of destination services, especially in pioneering natural tourism destinations (5).

5) Activities

The Puncak Dunu area has the potential for various tourism activities, including trekking and hiking, camping, marine tourism at Dunu Beach, turtle conservation education, bird watching, Gorontalo culinary tourism, and corn harvest agrotourism.



Figure 8. Turtle hatchery

Source:(2023 researcher survey documentation results)



Figure 9. Tourism Education for the Community in Dunu Village

Source:(2023 researcher survey documentation results)



Figure 10. Marine tourism activities in the waters of Dunu Beach
Source:(2023 researcher survey documentation results)

However, limited tour guides, tour packages, information services, security systems, and risk mitigation mean that these activities have not been integrated into a marketable tourism product. Lessons learned from the management of Nglanggeran Tourism Village and Penglipuran Tourism Village show that the success of tourism activities is largely determined by the integration of the 5A components and structured community-based management (6-8).

3.2 Tourist Perceptions and Instrument Quality

Tourist perception analysis was used to understand tourists' assessments of their experiences visiting Puncak Dunu. Perception is understood as a cognitive process formed from direct experience and influencing satisfaction levels and repeat visit tendencies (9,10). Questionnaire data was processed using SPSS for descriptive statistical analysis and instrument quality testing.

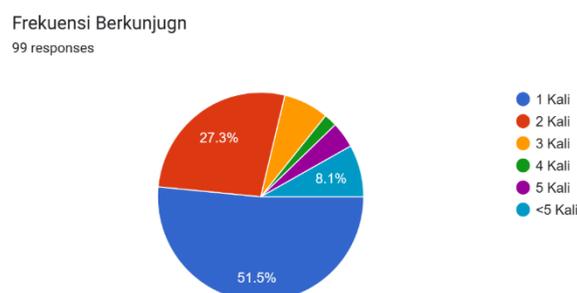


Figure 11. Pie Chart Visiting Frequency
Source: SPSS Researcher Data Processing Results, 2025

The analysis results show that respondents were predominantly female tourists, aged 18–22, and students. Visits were generally made with friends, and the majority of tourists were only one-time visitors. The low number of repeat visits indicates that the perceived benefits are not strong enough compared to the limited facilities and services available, in line with the Social Exchange Theory framework (11,12).

Table 1. Validity Test Results

Sub Variables	Item	Rhitung	RTable	Information
Destination Attraction (X1)	X1.1	0.903	0.196	Valid
	X1.2	0.875	0.196	Valid
	X1.3	0.849	0.196	Valid
Agrotourism (X2)	X2.1	0.643	0.196	Valid
	X2.2	0.818	0.196	Valid
	X2.3	0.688	0.196	Valid
Tourist Perception (Y)	Y.1	0.863	0.196	Valid
	Y.2	0.854	0.196	Valid
	Y.3	0.770	0.196	Valid

Source: SPSS Researcher Data Processing Results, 2025

Validity test shows that all items in the variables of Destination Attractiveness, Agrotourism, and Tourist Perception have a calculated r-value greater than the r-table (0.196) so that they are declared valid. Reliability test shows that the variables of Destination Attractiveness ($\alpha = 0.848$) and Tourist Perception ($\alpha = 0.770$) are reliable, while the variable of Agrotourism ($\alpha = 0.524$) is not yet reliable. This finding indicates that the main attraction of the destination has been formed in the perception of tourists, while additional tourism products are still weak and have not been consistently assessed (10,12).

3.3 Formulating Development Strategies Using SWOT, IFAS, and EFAS

A SWOT analysis is used to integrate internal and external factors of a destination in formulating contextual and applicable development strategies (13,14). The IFAS matrix results show a total score of 2.60, indicating that Puncak Dunu's internal strengths outweigh its weaknesses. The main strengths lie in its beautiful natural setting, paragliding and camping attractions, and local cultural potential, while weaknesses lie in accessibility, information, security, and human resources (1,3).

Table 2. SWOT Internal Factor Weighting Score

Code	Factor	Average	Weight	Score
S1	Amenities and MSMEs	3.1	0.067	0.208
S2	Tourist activities	4.1	0.089	0.365
S3	Attractions & Local Wisdom	3.7	0.080	0.296
S4	Paragliding	4.0	0.087	0.348
S5	Camping Place	3.8	0.082	0.312
S6	Beautiful Natural Atmosphere	4.5	0.097	0.437
W1	Accessibility	3.9	0.084	0.328
W2	Indonesian	4.6	0.100	0.460
W3	Accommodation	3.4	0.074	0.252
W4	Information	3.6	0.078	0.281
W5	Security	3.8	0.082	0.312
W6	Tour guide	3.7	0.080	0.296
	Total IFAS			2.60

Source: Researcher's Data Processing Results, 2024

The EFAS matrix results showed a total score of 2.40, indicating that external opportunities outweigh threats. The main opportunities stem from the potential for increased income for communities and MSMEs, tourism education, and the development of culinary arts based on local wisdom. Threats that need to be anticipated include the risk of environmental overcapacity, seasonal dependency, minimal risk mitigation, and potential land conflicts (8,15).

Table 3. SWOT External Factor Weighting Score

Code	Factor	Average	Weight	Score
O1	Income and MSMEs	4.6	0.113	0.520
O2	Cooperation & Facilities	3.9	0.096	0.374
O3	Tourism Education	4.7	0.115	0.541
O4	Culinary and Local Wisdom	4.0	0.098	0.392
O5	Village Accessibility	4.5	0.110	0.495
T1	Environmental Overcapacity	3.5	0.089	0.312
T2	Seasonal Dependence	3.7	0.093	0.344
T3	Minimal Mitigation	3.6	0.090	0.324
T4	Land Conflict	3.4	0.096	0.326
	Total EFAS			2.40

Source: Researcher's Data Processing Results, 2024

With an IFAS value of 2.60 and EFAS of 2.40, the position of Puncak Dunu natural tourism development is in Quadrant I, so the most appropriate strategy is the Strength-Opportunity (SO) strategy, which is utilizing internal strengths to capture external opportunities (13,14). This finding is in line with the study of the development of the Bukit Matang Kaladan natural tourism destination which emphasizes aggressive community-based strategies and strengthening local MSMEs (16).

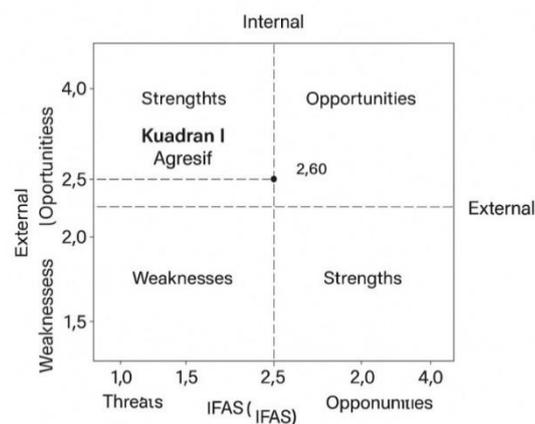


Figure 12. SWOT Matrix Chart with IFAS and EFAS

Source: Researcher's Data Processing Results, 2024

3.4 Translating Strategy into Master Plan and Implications

The Strength-Opportunity based development strategy was then translated into a development map (master plan) for the Puncak Dunu tourist area which was prepared using AutoCAD.



Figure 13. Development of the Puncak Dunu Tourism Master Plan

Source: Results of analysis and processing by researchers using AutoCAD, 2024

The master plan divides the area into service zones, special interest activity zones, and environmental protection zones to control visitor flow, improve safety, and maintain environmental carrying capacity. Compared with previous research that stopped at the formulation of conceptual strategies, the presence of a master plan in this study strengthens the implementation aspect. The integration of 5A analysis, tourist perceptions, IFAS-EFAS, SWOT, and spatial planning makes the research results more applicable and relevant in supporting decision-making for the sustainable management of pioneering nature tourism destinations (15,17).

3.5 Recommendation

1. Local governments and destination managers are advised to use the Puncak Dunu tourism master plan as the primary reference for developing policies and development programs. Zoning of tourism activities, service facilities, and environmental protection areas should be implemented in stages, taking into account the area's carrying capacity.
2. Improving the quality of amenities, accessibility, and supporting services needs to be prioritized to enhance the tourist experience. Providing basic facilities, improving tourism information systems, and strengthening destination security are expected to increase tourist satisfaction and encourage repeat visits.
3. Strengthening the capacity of local communities through tour guide training, homestay management, and the development of tourism-based MSMEs needs to be continuously improved. This step is crucial to ensuring a more equitable and sustainable distribution of tourism's economic benefits for the Dunu Village community.
4. Further research is recommended to develop more specific instruments for measuring tourist perceptions, especially regarding agrotourism and educational tourism activities, in order to obtain a more consistent and in-depth picture of perceptions.

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5. Further research can integrate environmental carrying capacity analysis and more detailed spatial planning studies to strengthen the planning of natural tourism destination development, especially in pioneering destinations with sensitive ecological characteristics.

Conclusion

This study aims to analyze the current state of Puncak Dunu nature tourism development in North Gorontalo Regency and formulate a sustainable development strategy. Based on the analysis and discussion, three main conclusions can be drawn in accordance with the research problem formulation. The condition of the Puncak Dunu natural tourist destination based on the 5A components indicates that this destination has strong potential for natural attractions and tourism activities, particularly hill panoramas, sea views, paragliding, and camping. However, this potential has not been optimally utilized due to limitations in aspects of amenities, accessibility, additional services, and supporting activities. These findings confirm that Puncak Dunu is still in the early stages of development and requires integrated planning to ensure sustainable management of its potential.

Tourist perceptions of Puncak Dunu show a relatively positive assessment of its natural attractions, but this has not been followed by a high rate of repeat visits. The majority of tourists are young and predominantly first-time visitors. Reliability testing results indicate that perceptions of the destination's main attractions have been consistently formed, while perceptions of agrotourism activities have not stabilized. This indicates that the benefits perceived by tourists are still initial experiences and not yet strong enough to encourage loyalty and repeat visits. The results of the SWOT analysis synthesized through the IFAS and EFAS matrices indicate that Puncak Dunu is in Quadrant I, with relatively dominant internal strengths and external opportunities. This strategic position indicates that an aggressive strategy based on Strengths-Opportunities is the most appropriate approach. This strategy was then translated into a development map (master plan) as an initial guide for spatial planning and sustainable management of the Puncak Dunu natural tourism destination. The existence of the master plan strengthens the implementation aspect of this research because it connects strategic analysis with operational spatial planning.

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Conflict of Interest

The authors declare no conflict of interest.

References

1. Central Statistics Agency of North Gorontalo Regency. North Gorontalo Regency in figures 2024. North Gorontalo: BPS North Gorontalo Regency; 2024.

2. Central Statistics Agency of Gorontalo Province. Gorontalo Province in figures 2023. Gorontalo: BPS Gorontalo Province; 2023.
3. Central Bureau of Statistics. Indonesian tourism indicators report 2023–2024. Jakarta: Central Bureau of Statistics; 2024.
4. North Gorontalo Regency Tourism and Culture Office. Annual report on tourist visits to North Gorontalo Regency. North Gorontalo: Tourism and Culture Office; 2023.
5. Hidayat M, Akhmad A, Syaifuddin S. Sustainable tourism development strategy in emerging destinations in Sulawesi. *J Sustain Tour.* 2023;31(6):1203–1221. doi:10.1080/09669582.2022.2044349.
6. Nugroho S, Pramono A, Wijayanto B. Integration of physical attractions and social support in post-pandemic sustainable tourism. *J Tourism Sci.* 2024;12(2):101–118.
7. Prasiasa DP, Susanti PH, Utama IGBR. Sustainable tourism development: social and economic perspectives. Jakarta: Rajawali Pers; 2021.
8. Setiawan R. Social transformation of rural communities in the development of tourist villages. *J Contemporary Sociology.* 2022;4(2):45–59.
9. Suasapha AH. The Doxey Scale in the perspective of socio-economic impacts of tourism. *J Tourism Culture.* 2020;5(1):31–42.
10. World Tourism Organization. Tourism and sustainable development goals. Madrid: UNWTO; 2020.
11. World Tourism Organization. Tourism and accessibility. Madrid: UNWTO; 2021.
12. World Tourism Organization. World tourism barometer: international tourism back to pre-pandemic levels in some regions. Madrid: UNWTO; 2023.
13. Yoeti OA. Tourism planning and development. Jakarta: Pradnya Paramita; 2020.
14. Morrison AM. Marketing and managing tourism destinations. London: Routledge; 2020.
15. Hall CM, Scott D, Gössling S. Pandemics, transformations and tourism: be careful what you wish for. *Tour Geogr.* 2020;22(3):577–598. doi:10.1080/14616688.2020.1759131.
16. David FR, David FR, David ME. Strategic management: a competitive advantage approach, concepts and cases. 17th ed. Harlow: Pearson Education; 2020.
17. Nunkoo R, Smith SLJ, Ramkissoon H. Residents' attitudes towards tourism: a longitudinal study of community perceptions. *J Sustain Tour.* 2021;29(6):965–984. doi:10.1080/09669582.2020.1825454.
18. Rasoolimanesh SM, Ringle CM, Jaafar M, Ramayah T. Urban vs rural destinations: residents' perceptions, community participation and support for tourism development. *Tour Manag.* 2020;78:104041. doi:10.1016/j.tourman.2019.104041.
19. Creswell JW, Creswell JD. Research design: qualitative, quantitative, and mixed methods approaches. 5th ed. Thousand Oaks: SAGE Publications; 2023.
20. Sugiyono. Qualitative, quantitative, and R&D research methods. Bandung: Alfabeta; 2020.
21. Tashakkori A, Teddlie C. Mixed methodology: combining qualitative and quantitative approaches. Thousand Oaks: SAGE Publications; 2021.
22. Ministry of Tourism and Creative Economy of the Republic of Indonesia. Penglipuran Tourism Village as a model of culture-based sustainable tourism. Jakarta: Ministry of Tourism and Creative Economy of the Republic of Indonesia; 2020.

23. Ministry of Tourism and Creative Economy of the Republic of Indonesia. Indonesian Tourism Village Award 2021: Nglanggeran Tourism Village. Jakarta: Ministry of Tourism and Creative Economy of the Republic of Indonesia; 2021.

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