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A SWOT Analysis for the Development of Karst Tubing as a Natural Tourism Attraction and Its Marketing Strategy for Sustainable Tourism Destinations

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Abstract: This study aims to analyze marketing strategies for the development of karst tubing as a natural tourism attraction within the framework of sustainable tourism destinations. The research employs a qualitative descriptive approach to examine the internal and external conditions of the Karst Tubing Sedayu Destination as the foundation for formulating sustainable marketing strategies. Data were collected through field observations and in-depth interviews with managers and relevant informants to obtain a comprehensive understanding of the destination's potential, challenges, and management practices. The data were analyzed using the SWOT method to identify the strengths, weaknesses, opportunities, and threats that influence destination development.

The results show that the marketing of Karst Tubing Sedayu has strong potential to be developed as a sustainable natural tourism destination. The destination's main advantages lie in the uniqueness of its natural karst landscape, its aesthetic and geological educational value, and its relatively good accessibility. However, development still faces several obstacles, including limited supporting facilities and infrastructure, suboptimal safety equipment conditions, and environmental and safety risks related to extreme weather and uncontrolled tourism activities. The SWOT analysis indicates that integrated sustainable marketing strategies—rooted in conservation principles, safety, and stakeholder engagement—are essential for enhancing destination competitiveness while preserving the karst environment. Implementing these strategies is expected to support destination sustainability and provide economic and social benefits to the local community.

Keywords: Karst Tourism, SWOT, Marketing, Karst Tubing Sedayu

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PENDAHULUAN (INTRODUCTION)

Sustainable tourism development currently occupies a strategic position on the global development agenda because it is seen as capable of addressing multidimensional challenges, ranging from inclusive economic growth to environmental protection and improving the social welfare of local communities.

Destination development must move beyond simply focusing on visitor volume to improving the quality of tourism experiences, preserving the environment, and strengthening local socio-economic resilience, as a purely quantitative approach often leads to unbalanced environmental pressures and negative impacts on local communities (Pasuhuk & Mandagi, 2025). In line with this, recent research shows that destinations that integrate environmental, social, and economic aspects in a balanced manner tend to have higher competitiveness and long-term resilience to global crises, including climate change and tourism market uncertainty (Bramwell et al., 2021).

In this context, adventure-based and geological resource-based nature tourism, or geotourism, has experienced significant growth as an alternative to mass tourism, which risks environmental degradation. Geotourism is considered capable of providing tourism experiences that are not only recreational but also educational through the interpretation of a region's geological, ecological, and cultural values. Recent studies confirm that modern travelers increasingly value destinations that offer authentic experiences, environmental education, and responsible management practices (Briggs et al., 2021). In addition, geotourism contributes to increasing conservation awareness and empowering local communities if developed through appropriate strategic planning (Vélez-macías et al., 2024). However, without a targeted management and marketing strategy, the potential for geotourism could actually turn into a threat to the sustainability of the sensitive karst ecosystem., thus requiring a comprehensive analytical approach.

Sedayu Karst Tubing is an adventure-based natural tourism destination located in Surobayan Hamlet, Argomulyo Village, Sedayu District, Bantul Regency, Yogyakarta Special Region. This destination was developed by utilizing the potential of the Konteng River as the primary medium for tourism activities, including river tubing using inner tubes, over a course approximately one kilometer long. The activities offered at this location are not only limited to river tubing, but also include outbound, archery, paintball, and a camping ground area. These activities are designed to provide a challenging recreational experience while blending with the natural environment, thus attracting tourists who are interested in special interest and adventure tourism. This is reinforced by research by (Vélez-macías et al., 2024), which explains that the diversity of activities at tourist destinations can increase the duration of tourists' stay and increase the economic contribution to the local area.

The main attraction of Karst Tubing Sedayu lies not only in the river tubing activities offered, but also in the characteristics of the area's physical environment, which is dominated by karst landscapes. The presence of karst rock cliffs, natural geological structures, and vegetation conditions along the river flow create a distinctive landscape that has both aesthetic and scientific value. With the combination of adventure tourism activities and the area's geological value, Karst Tubing Sedayu has the potential to be developed as a nature tourism destination oriented towards quality experiences and sustainable management. These findings align with the results of a study by (Kubal et al., 2022), which emphasized that geological resource-based tourism destinations have the ability to simultaneously integrate recreational and educational aspects, thereby creating a value-added tourism experience and increasing the destination's attractiveness to tourists.

Developing sustainable tourism destinations requires a planned and comprehensive strategy involving various stakeholders, such as local communities, managers, local governments, and tourism businesses. This collaboration is crucial so that destination development is not solely focused on increasing the number of visitors.but also able to maintain the sustainability of resources and community welfare.Karst areas have high geological and ecological vulnerability., so that tourism management that is not carefully designed has the potential to cause permanent environmental degradation.This condition emphasizes the urgency of implementing a strategic approach that is able to systematically identify supporting and inhibiting factors for the development of karst tourism destinations.

Marketing plays a strategic role in introducing the potential of Sedayu Karst Tubing Tourism to a wider market segment. Utilizing digital media, such as social media and official websites, as well as developing collaborations with travel agencies, can significantly increase the visibility and attractiveness of a destination. Furthermore, conventional marketing strategies, such as brochure distribution, community based activities, and collaboration with educational institutions and nature-loving communities, can be supporting instruments in expanding the reach of karst-based tourism promotions. (Khan et al., 2022) emphasized that an integrated marketing strategy combining digital and

conventional channels has proven effective in increasing the exposure and competitiveness of ecotourism destinations.

Furthermore, local community involvement is a crucial aspect of sustainable tourism development. Increasing community participation through training and empowerment programs, such as tour guide training, homestay management, and area cleanliness and security management, has the potential to create new job opportunities and improve the economic well-being of local communities. Garcia and Lopez (2023) state that active local community participation in the tourism industry is a key factor in driving inclusive and sustainable local economic development.

In addition to marketing and community empowerment, the development of Sedayu Karst Tubing Tourism also needs to be directed at tourism product innovation. This innovation can be realized through the development of educational tourism packages that integrate elements of geological knowledge, environmental conservation, and local culture. Authentic, recreational, and educational tourism experiences can become a competitive advantage that differentiates Sedayu Karst Tubing from similar tourist destinations. Chen and Wang (2021) emphasize that innovation in educational tourism products plays a crucial role in enhancing the value of a destination while supporting informal learning processes for tourists.

With a comprehensive development approach, a well-planned marketing strategy, and support from various stakeholders, Sedayu Karst Tubing Tourism has great potential to develop as a leading adventure and educational tourism destination in the Special Region of Yogyakarta. In addition to providing a quality tourism experience, the development of this destination also has the potential to become a model for tourism management practices that emphasize environmental conservation and sustainable community empowerment. Thompson and Green (2024) emphasized that a tourism development model oriented towards environmental conservation and community participation will become the main paradigm in the sustainable tourism industry in the future.g.

Based on this description, There is an urgent need to formulate marketing strategies that are not only economically effective, but also adaptive to the environmental vulnerabilities of karst areas. Therefore, a SWOT analysis is considered relevant as a strategic approach to identify internal strengths and weaknesses, as well as external opportunities and threats that affect the management and marketing of Karst Tubing Nature Tourism. Through this approach, the study aims to analyze the internal and external conditions of the destination and formulate a sustainable marketing strategy to increase the competitiveness of Sedayu Karst Tubing amidst the increasingly competitive dynamics of the tourism industry.

(METHODS)

This study uses a qualitative descriptive approach supported by quantitative data, with the aim of analyzing the internal and external conditions of the Karst Tubing Nature Tourism destination as a basis for formulating a sustainable marketing strategy. Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis is used as a strategic analysis tool to identify various factors that influence the development of tourist attractions. The qualitative approach in this study serves to explore, understand, and describe social phenomena in depth that cannot be measured quantitatively (Nasution, 2023). The study was conducted from August to November 2025. Data collection techniques were carried out through direct observation of tourism management activities, as well as interviews with Karst Tubing Nature Tourism managers to obtain comprehensive information regarding the conditions and management strategies of the destination.

RESULT & DISCUSSION

The Sedayu Karst Tubing Destination is a water tourism destination located in Sedayu District, Bantul Regency, Yogyakarta Special Region. This destination offers nature-based water recreation activities, utilizing the river flow flanked by natural karst rocks as its main attraction. The unique karst rock formations, pristine environment, and cool atmosphere provide a unique tourism experience for visitors. These characteristics are important factors in attracting tourists, especially those seeking nature-based and adventure-based tourism experiences.

Strengths

Sedayu Karst Tubing offers a strategic advantage in terms of accessibility, due to its relatively close location to the Yogyakarta-Wates Highway, making it easily accessible to tourists from various regions. This advantage is further enhanced by the pristine natural environment, particularly the naturally occurring karst rock formations that are the destination's main attraction. This geological uniqueness not only provides aesthetic value but also offers a recreational and educational tourism experience for visitors.

This aligns with the view of, who stated that karst landscapes possess high aesthetic, scientific, and educational value, thus offering significant potential for development as sustainable geotourism destinations. The authenticity of the landscape and its unique geological characteristics are key factors in enhancing the attractiveness and competitiveness of nature-based tourism destinations.

Weaknesses

Despite its strong natural potential, Sedayu Karst Tubing still faces several weaknesses that require serious attention in efforts to improve the quality of tourism services. One major obstacle is limited parking, which causes inconvenience for tourists, especially during peak periods. Furthermore, the inadequate road access to the tourist site also impacts visitor comfort and ease of access.

Another weakness relates to the condition of safety equipment, such as tubing tires, helmets, and life jackets, some of which are worn and potentially do not meet safety standards. This condition not only reduces the quality of the tourism experience but also increases the risk of accidents for visitors. Kelam & Sintang, n.d., (2025) emphasized that the quality of tourism facilities and infrastructure significantly influences tourist satisfaction. In his research at the Tegenungan Waterfall tourist attraction in Bali, facilities contributed 45.1% to visitor satisfaction. This finding indicates that improving facilities and infrastructure is a crucial factor in creating a safe and enjoyable tourism experience.

Opportunities

Sedayu Karst Tubing offers significant potential for destination marketing development through digital strategies, such as social media, website management, and collaboration with travel agencies. Advances in information technology and the increasing use of social media offer opportunities to expand promotional reach and increase destination visibility, particularly among young tourists.

Social media, especially Instagram, has proven effective in building the image of natural tourism destinations through engaging visualizations of tourism experiences. Margaretha et al., (2022) explain that digital media literacy and social media competence among millennials play a crucial role in encouraging their participation in tourism promotion. With the right digital strategy, Sedayu Karst Tubing has the potential to sustainably increase tourist appeal and visitor numbers.

Threats

On the other hand, Sedayu Karst Tubing also faces several threats that could impact the sustainability of its development. One major threat is competition with other tubing destinations in the Yogyakarta Special Region that offer similar tourism products. In the context of geotourism (Gordon, 2023). Assert that competition can be reduced through tourism product innovation and differentiation strategies based on local characteristics that are oriented toward sustainability.

Other threats stem from extreme weather and seasonal factors, which can increase the risk of accidents and reduce the safety of tubing activities. Furthermore, unsustainably managed tourism activities have the potential to cause environmental impacts, such as riverbank erosion, damage to riparian vegetation, and degradation of natural rocks. Gordon, (2023) also emphasize that global climate change has increased the frequency of extreme weather in outdoor tourism areas, making the implementation of risk mitigation systems crucial. Furthermore, (Kubal et al., 2022)emphasize that karst areas have high ecological sensitivity, so conservation-based management is absolutely necessary to prevent long-term environmental damage.

SWOT Strategy Matrix for Sedayu Karst Tubing Development

Strategi SO (Strengths–Opportunities)

The SO strategy is aimed at leveraging the destination's internal strengths to seize available external opportunities. The advantages of Sedayu Karst Tubing, including its excellent accessibility and unique, pristine karst landscape, can be optimized through a visual content-based digital marketing strategy. Utilizing social media and the official website to highlight the authenticity of the karst landscape, the educational value of geology, and the adventure tourism experience is believed to increase the destination's appeal, particularly to young tourists and nature enthusiasts.

This strategy aligns with (Kubal et al., 2022), who stated that unique geological characteristics and landscape authenticity are key assets in developing sustainable geotourism. Furthermore, the use of digital media as a promotional tool is supported by the findings of (Margaretha et al., 2022), who emphasized the crucial role of social media in enhancing the exposure and image of natural tourism destinations.

Strategi WO (Weaknesses–Opportunities)

The WO strategy focuses on minimizing internal weaknesses by capitalizing on external opportunities. Limited supporting facilities, such as parking areas, road access, and safety equipment, can be addressed through increased collaboration with external parties, including local governments, private investors, and travel agencies. Digital promotional support can also be leveraged to attract investors and strategic partners for infrastructure development and improving tourism safety standards. Improving the quality of facilities and infrastructure is a crucial factor in supporting a safe and comfortable tourism experience. (Kelam & Sintang, 2025) emphasized that tourism facilities significantly influence visitor satisfaction at natural attractions. Therefore, a WO strategy is crucial to ensure that opportunities for tourism growth are balanced with adequate facility readiness and management.

Strategi ST (Strengths–Threats)

The ST strategy aims to leverage internal strengths to address external threats. The unique karst geology and pristine environmental conditions can serve as the basis for a tourism product differentiation strategy to compete with other tubing destinations in the Special Region of Yogyakarta. Developing tourism packages based on environmental education, geological interpretation, and conservation-oriented adventure tourism can strengthen Sedayu Karst Tubing's position as a destination with added value compared to its competitors. (Gordon, 2023) emphasized that differentiation based on local characteristics and sustainability is an effective strategy for increasing the competitiveness of geotourism destinations. By leveraging its natural strengths, Sedayu Karst Tubing can mitigate the impact of competition while enhancing the destination's image as a responsible nature tourism destination.

Strategi WT (Weaknesses–Threats)

The WT strategy focuses on defensive efforts to minimize internal weaknesses while avoiding external threats. Limited safety facilities and equipment, if not promptly addressed, can increase the risk of accidents, especially in extreme weather conditions. Therefore, strict implementation of safety standard operating procedures (SOPs), regular updates to tourism equipment, and visitor restrictions are required in accordance with environmental carrying capacity.

Furthermore, conservation-based management needs to be implemented to reduce the risk of damage to karst environments, which have high ecological sensitivity. (Kubal et al., 2022) emphasize that karst areas are highly vulnerable to degradation due to human activities, making a conservation approach essential. (Gordon, 2023) also add that global climate change is increasing the frequency of extreme weather events, so risk mitigation strategies and adaptation to environmental conditions must be an integral part of managing nature tourism destinations.

Discussion

A sustainable marketing strategy for the Sedayu Karst Tubing Destination needs to be formulated by balancing increasing tourist appeal, visitor satisfaction, and preserving the natural environment.

Based on the SWOT analysis, the implemented marketing strategy should not only focus on increasing visitor numbers but also on the sustainability of the karst's ecologically sensitive natural resources.

1. Optimizing Natural Attractions as a Main Selling Point

The results of the SO strategy show that the uniqueness of the karst landscape and good accessibility are key assets in developing destination marketing. The authenticity of the environment, karst rock formations, and the adventure tourism experiences offered can be packaged as a unique selling proposition (USP) in marketing strategies. Conveying educational value related to geology and environmental conservation through digital promotional content is a relevant approach to attracting special interest tourism segments.

This approach aligns with (Kubal et al., 2022), who assert that the success of geotourism marketing is largely determined by the destination's ability to sustainably communicate the scientific and aesthetic value of the landscape. Therefore, the Sedayu Karst Tubing marketing strategy emphasizes not only recreational aspects but also education and conservation.

2 Strengthening Digital Marketing and Stakeholder Engagement

The WO strategy emphasizes the importance of leveraging digital marketing opportunities to address facility and management limitations. Social media, official websites, and collaborations with travel agencies can be utilized as promotional tools and to communicate to potential tourists about the destination's commitment to safety and environmental sustainability. Transparency in information regarding safety standards, visitor capacity, and eco-friendly tourism regulations can boost visitor confidence.

Emphasize that the involvement of social media users, particularly millennials, plays a crucial role in disseminating a positive image of a tourist destination (Margaretha et al., 2022). Therefore, sustainable marketing strategies need to involve various stakeholders, including local communities, managers, and tourists, as part of the destination promotion ecosystem.

3 Differentiation of Sustainability-Based Tourism Products.

Based on ST's strategy, tourism product differentiation is key to facing competition from other tubing destinations in the Special Region of Yogyakarta. Karst Tubing Sedayu can develop tourism packages based on conservation, geological education, and environmentally conscious adventure tourism. This differentiation not only increases competitiveness but also strengthens the destination's image as a responsible nature tourism destination. (Gordon, 2023) emphasized that tourism product innovation based on local characteristics and sustainability is an effective strategy for increasing the competitiveness of geotourism destinations. By prioritizing sustainability principles, Sedayu Karst Tubing can attract a tourist segment with high environmental awareness and a tendency to be loyal to the destination.

4 Risk Management and Environmental Protection as Part of Marketing Strategy

The WT strategy demonstrates that safety and environmental protection must be an integral part of any sustainable marketing strategy. Implementing safety standard operating procedures (SOPs), updating tourism equipment, and limiting visitor numbers according to the environment's carrying capacity are essential steps to minimize the risk of accidents and environmental degradation. Information regarding the implementation of these safety and conservation standards can be communicated openly in promotional materials as a demonstration of management's commitment to sustainable tourism. (Kubal et al., 2022) emphasize that karst areas have high ecological vulnerability, making conservation-based management a key prerequisite for tourism development. Furthermore, (Gordon, 2023) state that the increasing frequency of extreme weather events due to global climate change requires nature tourism destinations to have adaptive risk mitigation strategies. Therefore, sustainable marketing serves not only as a promotional tool but also as a medium for education and managing tourist expectations.

5 Implications for Destination Sustainability

Overall, the discussion results indicate that a sustainable marketing strategy for Sedayu Karst Tubing must be designed holistically, integrating environmental, social, and economic aspects. This approach allows the destination to increase its competitiveness while maintaining the long-term sustainability of its karst natural resources. A sustainability-oriented marketing strategy is expected to create a balance between tourism growth and environmental protection, enabling Sedayu Karst Tubing to develop as a sustainable and highly competitive nature tourism destination.

CONCLUSION

Based on the results of the SWOT analysis and discussion of sustainable marketing strategies, it can be concluded that the Sedayu Karst Tubing Destination has great potential to be developed as a sustainable nature tourism destination with high competitiveness. The main advantages of the unique karst landscape, environmental authenticity, and relatively good accessibility are strategic capital in developing destination marketing. However, this development still faces several challenges, particularly limited facilities and infrastructure, the condition of safety equipment, and environmental risks due to competition from similar destinations and the influence of extreme weather. Therefore, a sustainable marketing strategy integrated with the principles of conservation, safety, and tourism product differentiation is an urgent need to maintain a balance between increasing tourist visits and preserving the karst environment.

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The author acknowledges that this research still has limitations, both in terms of substance, methods, and presentation. Therefore, the author is very open to constructive suggestions and criticisms for future improvements. The author hopes that this scientific work will benefit the development of science and serve as a reference for further relevant research.

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