

Rangko Village Ecotourism: A Qualitative Review of Potentials and Challenges

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ABSTRACT

The burgeoning ecotourism industry, aiming for sustainability and minimal environmental impact, has prompted many regions to reevaluate their tourism practices.. This study delves deep into Goa Rangko, a promising destination within Manggarai Barat, Indonesia, by implementing an ecotourism potential framework combined with SWOT analysis. This paper identifies the intrinsic strengths of Goa Rangko, such as its untouched natural beauty, indigenous culture, and governmental initiatives fostering eco-friendliness. It concurrently uncovers weaknesses in the tourism sector, including waste management concerns and the aftermath of the COVID-19 pandemic. The exploration reveals multiple opportunities for sustainable growth, emphasizing unique product promotion, embracing technological advances, and fostering collaborations while accounting for impending threats, such as environmental degradation and competitive destinations. By integrating the ecotourism potential framework with SWOT analysis, this study provides a comprehensive roadmap for Goa Rangko's tourism sector, highlighting avenues for optimizing tourist experiences and environmental stewardship.

Keywords: Goa Rangko, Indonesia, ecotourism, sustainable tourism, SWOT analysis

INTRODUCTION

Labuan Bajo, situated at the western extremity of Flores Island in Indonesia, has transcended its identity as a serene fishing village to become the gateway to the illustrious Komodo National Park. This transformation has positioned it as a central node for tourism, attracting a global audience eager to experience the natural and prehistoric wonders of the Komodo dragons alongside the marine biodiversity of the region (Purwandana et al., 2014; Turicchia et al., 2018). With the influx of tourists arriving in droves to catch a glimpse of the famed Komodo dragons (*Varanus komodoensis*) and dive into its crystal-clear waters teeming marine life, the importance of ecotourism in Labuan Bajo has become more pressing than ever. The foundational principle of ecotourism lies in preserving and appreciating the nature and indigenous cultures inhabiting them. At its core, ecotourism strikes a delicate balance between tourism and conservation. The increasing number of visitors underscores the critical role of ecotourism in Labuan Bajo, emphasizing the importance of harmonizing tourism activities with conservation efforts (Purwanta et al., 2022).

The preservation of Komodo dragons is crucial for supporting ecological balance within their habitats. As apex predators, they play a pivotal role in the ecosystem by controlling the population of other species, thus maintaining the health of their environment (Jessop et al., 2020). Strategies, such as habitat protection and community-based conservation programs, could be pivotal in ensuring the survival of Komodo dragons (Hidyarko et al., 2021). These efforts contribute to preserving these magnificent creatures and supporting the sustainability of the local communities that coexist with them. By fostering an environment in which ecotourism thrives responsibly, we can ensure that the economic benefits do not come at the expense of the Komodo dragon's well-being, thereby securing their future for future generations (Nguyen et al., 2022; Sutrisno et al., 2023b). Beyond environmental conservation, ecotourism has the potential to catalyze the socio-economic development of indigenous communities. By fostering local participation, ecotourism can ensure that the community reaps economic rewards, such as employment opportunities in guiding artisanal crafts and conservation projects, thus supporting a holistic growth model that benefits the ecosystem and its inhabitants (Birendra, 2021).

Goa Rangko, a prime ecological site near Labuan Bajo in Manggarai Barat, NTT, remains a centerpiece in the region's ecotourism story. The visiting trends to Manggarai, representing a broader region, including Goa Rangko, have seen fluctuations reflective of global and local challenges. After peaking at 220,125 visitors in 2019, the number plummeted to 62,488 in 2020, likely owing to travel restrictions during the COVID-19 pandemic. In subsequent years, there has been a recovery, with visitors increasing to 139,112 in 2021 and 421,555 in 2022, signaling a rebound in interest. According to Disparekrabud's records, within this broader context, Goa Rangko itself attracted 17,361 visitors in 2022. A closer look at the demographics indicates a predominant domestic interest, with 'wisatawan nusantara' forming the bulk at 13,371 compared to 3,990 international tourists. This disparity highlights the cave's popularity within Indonesia and suggests its potential for expanding its international visitor base. Despite the overall increase in tourism, a surprising decline occurred in December, typically a high season, when only 1,030 visitors, including 178 international and 852 domestic tourists, were reported. Weather conditions are hypothesized to influence this decline, with December's unpredictable climate deterring tourists and impacting the wider Labuan Bajo Region.

Tourists, as vital connectors (Nanjangud & Reijnders, 2022), are integral to promoting destinations such as Goa Rangko. The site's allure, rooted in its unspoiled natural beauty, from stunning caves to diverse wildlife, calls for the careful consideration of sustainable tourism practices. As visitor numbers increase, the need for a cohesive, sustainable strategy becomes evident. Ad-hoc methods with limited sustainability focus and minimal local community engagement underscore the necessity for a strategic vision. Furthermore, the absence of thorough tourism environmental and social impact data calls for improved research and data collection to guide sustainable tourism development in Rangko. The identification of research gaps stemmed from a combination of literature review, stakeholder interviews, and analysis of current tourism data. While no prior study explicitly identifies these gaps for Goa Rangko, our review highlights a lack of integrated approaches combining environmental, social, and economic assessments specific to the region. Additionally, discussions with local authorities and tourism

experts revealed the need for more detailed data on the impacts of tourism, which our study aims to address.

The realm of ecotourism, representing a synthesis of environmental conservation and mindful tourism, is essential for testing the effectiveness of ecotourism initiatives (Dangi & Jamal, 2016; Jamal et al., 2013). The pressing need to scrutinize and refine the ecotourism model in Goa Rangko arises from its ecological importance and the challenges of escalating tourist interests. A preliminary review revealed several areas for improvement: the absence of a unified ecotourism strategy, sporadic community involvement, and lack of ongoing monitoring and evaluation. These gaps underscore the necessity of a cohesive, community-inclusive approach to ecotourism, underpinned by continuous assessment and adjustment. This study aims to provide an analysis specific to Goa Rangko, advocating for a localized approach to ecotourism that values regional specificity alongside global principles for sustainable engagement.

To explore ecotourism development in Labuan Bajo, particularly within Desa Rangko, we have undertaken a methodical examination of stakeholder dynamics, identifying any exclusionary practices and understanding the intricate mesh of institutional frameworks that guide ecotourism and its resource utilization. This meticulous process aims to illuminate the complex interactions among various actors within the ecotourism landscape and gauge the socioeconomic effects on disparate community factions. Our methodology includes comprehensive stakeholder mapping to delineate the roles and interests of the diverse parties involved in Desa Rangko's ecotourism, ranging from local communities and government bodies to tour operators, NGOs, and tourists. This foundational step is pivotal in pinpointing practices or policies that potentially marginalize specific groups from the benefits of ecotourism. Special attention is paid to the hurdles that local artisans, guides, and small entrepreneurs face when accessing the tourism marketplace. Additionally, we scrutinized the distribution of economic benefits from tourism to assess whether it is equitable or skewed in favor of certain stakeholders over others.

Moreover, our analysis delves into the formal legislative framework and informal norms that dictate ecotourism activities in Desa Rangko. This encompasses reviewing policies related to environmental protection, land use, and tourism alongside community customs that impact ecotourism ventures. Assessing stakeholder adherence to these guidelines and the effectiveness of enforcement actions are crucial (Carroll & Groom, 2006). Our investigation also encapsulates the support mechanisms available to stakeholders, particularly local communities, in their engagement with ecotourism activities while identifying any institutional impediments or challenges that may stifle the sustainable development of ecotourism, including bureaucratic obstacles and lack of adequate funding for conservation efforts. To enrich our sociological analysis, we employed qualitative research methodologies, including in-depth interviews that offer a window into the lived experiences of community members, the subtleties of stakeholder relationships, and the socio-cultural ramifications of ecotourism endeavors. By conducting a comparative analysis with other ecotourism sites, we aimed to uncover the best practices and lessons that could be applied to enhance ecotourism development in Desa Rangko and similar settings.

The increasing global acknowledgment of ecotourism highlights its capacity to serve as a sustainable travel model, alongside being a catalyst for community empowerment and environmental conservation. Goa Rangko, endowed with untouched natural beauty and ecological importance, offers an ideal setting for the application of ecotourism principles (Carroll & Groom, 2006). However, the practical implementation of such a model often faces challenges, unexpected results, and complex dynamics. Therefore, it is essential to thoroughly evaluate the effectiveness, consequences, and fundamental processes of the ecotourism projects initiated in Goa Rangko. An explicit statement delineates the scope of the analysis to refine our investigation, allowing for the precise application of the Strengths & Weaknesses (SW) and Opportunities & Threats (OT) analytical framework. The SW analysis focused on the internal aspects of the Desa Rangko community, highlighting its inherent capabilities and areas for improvement. In contrast, OT analysis examines the external elements that influence a community's ecotourism system. This bifurcated approach ensures a comprehensive understanding of both the internal dynamics and external pressures affecting ecotourism in Goa Rangko, thereby setting the stage for targeted strategies that bolster sustainable development and community resilience.

METHODS

In our study, we opted for a qualitative approach to thoroughly explore the intricate landscape of ecotourism development in Desa Rangko. This methodological choice was crucial for delving into ecotourism's multifaceted dynamics, encompassing the depth of social interactions, stakeholder perspectives, and underlying institutional frameworks. By integrating both qualitative and quantitative research paradigms, we aimed to unveil qualitative insights while quantifying the distribution of ecotourism benefits and evaluating their broader socio-economic impacts. Purposive sampling was employed to collect qualitative data by deliberately selecting participants from various sectors vital to the ecotourism ecosystem. This meticulous selection process aimed to ensure a comprehensive understanding of the ecotourism dynamics in Desa Rangko. Our participants ranged from local community members deeply rooted in the daily life of Desa Rangko to government officials engaged in policy formulation, representatives from non-governmental organizations advocating ecotourism, ecotourism operators offering direct experiences, and tourists providing feedback on ecotourism offerings.

We conducted in-depth interviews with a diverse group of ten participants. This group was chosen to represent different social positions within the community, encompassing local artisans, tour guides, small business owners, and local leaders. This inclusive approach allowed us to collect rich and nuanced data reflecting the various dimensions of ecotourism in Desa Rangko. Through comprehensive interviews, this study aims to provide an in-depth exploration of the ecotourism landscape, highlighting its strengths, pinpointing its challenges, and uncovering opportunities for sustainable development and community empowerment. Our analysis used thematic analysis to identify and interpret the collected data, focusing on key issues within ecotourism development. The initial phase of our analysis involved data reduction, in which interview transcripts and field observations were combed to isolate recurring themes and patterns. This meticulous process, guided by our research questions and rooted in the conceptual framework of adaptive capacity within the ecotourism context, allowed us to offer detailed descriptions for each identified theme. These descriptions, bolstered by direct quotations from our informants, lend authenticity and depth to our analytical narratives.

Additionally, we employed a qualitative approach. We utilized SWOT analysis as a strategic planning tool to delineate ecotourism endeavors' strengths, weaknesses, opportunities, and threats. This comprehensive examination, solely leveraging qualitative insights from stakeholder discussions, plays a pivotal role in uncovering the existing ecotourism model's inherent strengths and weaknesses. Furthermore, it identifies external factors that could either bolster or hinder its sustainable trajectory. By integrating thematic analysis with SWOT evaluation, our study provides a detailed and evidence-based critique of ecotourism in Desa Rangko. This synthesis underscores the empirical findings and situates them within the broader discourse on sustainable development. It presented a nuanced assessment of ecotourism's significance and potential within the socio-economic and environmental landscape of the community, demonstrating the effectiveness of a qualitative approach in elucidating the complexities of ecotourism development.

RESULTS AND DISCUSSION

Study Location

Hidden amid the picturesque settings of Manggarai Barat in Nusa Tenggara Timur lies the fascinating Goa Rangko (Figure 1). This natural marvel continues to attract the attention of those visiting Labuan Bajo (Wea, 2021). The cave's interior boasts a crystalline saltwater pool that spans a depth of approximately seven meters, offering visitors a sublime experience. With the promise of a refreshing dip in the clearest waters, tourists often find themselves irresistibly drawn to immerse or swim in this magnificent underground reservoir. A natural mesmerizing phenomenon can be observed as sunlight filters into the cave, painting the pool with brilliant hues of azure. This cerulean canvas is not a mere consequence of the pool's inherent clarity, but is intensified by the sun's rays refracting and reflecting within the cave's confines.

The magic of this place does not just end in its shimmering waters. The dim recesses of the cave, which one might initially perceive as sombers, are miraculously transformed as the sun's beams strike the cave's walls. With their unique composition, these walls bounce back sunlight, illuminating deeper segments of the cave. Such interplay of darkness and light amplifies the cave's mystique, providing an ethereal backdrop for visitors. The limestone formations of the cave were added to this grandeur. These stalagmites and stalactites, forming near the cave entrance, stand as testaments to the intricate processes of nature over millennia, narrating a story of persistence and time.

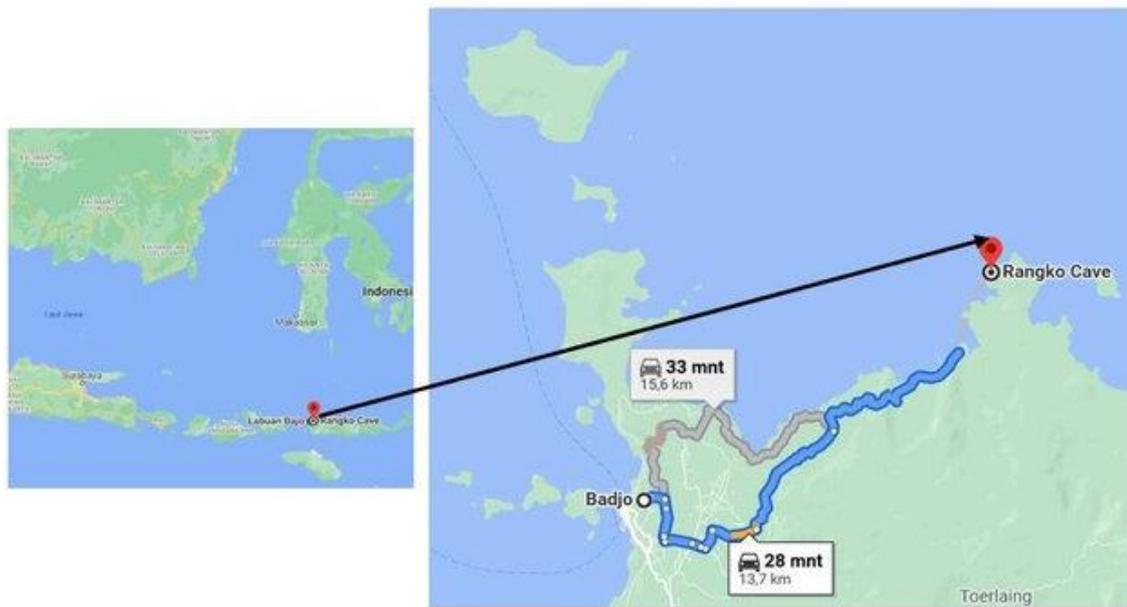


Figure 1. Study site location (Suryawan, Mulyana, et al., 2023)

Positioned close to the beach, Goa Rangko is thrilling as the destination. Adventurers can choose either land or sea routes from Labuan Bajo. The latter involves a roughly 30-minute sail, followed by a 45-minute boat ride from Rangko Village's pier. However, the voyage was not concluded here. Upon arrival, visitors are greeted with a short yet exhilarating 20-minute trek, navigating through nature's wonder before they can set their sights at the cave's entrance.



Boat ride from Rangko Village's pier



Goa Rangko

Figure 2. Overview Goa Rangko, Manggarai Barat in Nusa Tenggara Timur

While Goa Rangko is enchanting at any given time, there is a golden window between 13:00 and 15:00 WITA (Central Indonesia Time) that promises excellent experience. During these hours, the sun's position was optimal, ensuring that its rays penetrated deep into the cave. As a result, the interiors are bathed in soft luminance, dispelling shadows, and unveiling the cave in all its glory. For those keen on adding this gem to their itinerary, a visit comes at a modest entrance fee. International tourists, or

‘wisman,’ are charged Rp50,000, while domestic tourists from other parts of Indonesia, termed ‘wisnus,’ are levied Rp20,000. Local visitors benefit from a subsidy rate of Rp10,000.

Key Themes in the Stakeholder’s Perspectives

Table 1 provides a succinct summary of the key themes that emerged from our thematic analysis and the frequency with which different stakeholder types discussed these themes. Our research sought to capture the diverse perspectives within the ecotourism landscape of Desa Rangko, from individuals and organizations directly involved in tourism to those affected by or contributing to its development. By categorizing stakeholder commentary into distinctive themes such as community participation, socio-

Table 1. Thematic Frequency and Stakeholder Engagement in Ecotourism

	Theme	Frequency	Stakeholder Types
Community Participation	We delved into the theme of Community Participation, which various stakeholders discussed with the highest frequency. This section explored the diverse roles played by local governments, NGOs, tourist operators, researchers, and members of the local community. Excerpts from interviews and discussions that illustrated the community’s active involvement and its influence on ecotourism development were presented.	7	Local Government, NGO, Tourist Operator, Lecturer, Researcher, Local Community (2)
Socio-economic Impacts	Socio-economic Impacts were examined through the perspectives of stakeholders who underscored their importance. This part of the section outlined how the integration of ecotourism influenced local economies and social structures. Data points and quotes from researchers, lecturers, NGOs, local community members, and tourist operators were included to provide a comprehensive view of this theme.	5	Researcher, Lecturer, NGO, Local Community, Tourist Operator
Environmental Conservation	The Environmental Conservation section integrated insights from stakeholders who prioritized this theme, emphasizing the role of ecotourism in preserving natural resources. Contributions from NGOs, researchers, lecturers, local governments, and tourist operators highlighted the strategies and concerns related to environmental stewardship.	8	NGO (2), Researcher, Lecturer, Local Government, Tourist Operator, Local Community (2)
Challenges in Ecotourism	This section focused on the Challenges in Ecotourism as identified by the local community, local government, tourist operators, NGOs, researchers, and lecturers. It synthesized their viewpoints to address the obstacles faced by ecotourism in the region and discussed potential solutions.	6	Local Community, Local Government, Tourist Operator, NGO, Researcher, Lecturer
Opportunities for Improvement	Opportunities for Improvement covered the prospects for enhancing ecotourism practices, as discussed by tourist operators, local government officials, lecturers, and NGO representatives. Testimonials and suggestions were incorporated to underscore the potential for growth and development within the sector.	4	Tourist Operator, Local Government, Lecturer, NGO
Impact of Seasonality on Visit	The Impact of Seasonality on Visit presented the insights from tourist operators, local community members, and local government officials. The discussion was framed around the patterns observed and their implications for the sustainability and scalability of ecotourism activities.	3	Tourist Operator, Local Community, Local Government
Tourism Infrastructure	Tourism infrastructure section gathered the input from local governments, local community stakeholders, tourist operators, NGOs, and lecturers. It explored the current state of the infrastructure, its adequacy in supporting ecotourism, and the areas in need of investment and improvement.	5	Local Government, Local Community, Tourist Operator, NGO, Lecturer

economic impacts, environmental conservation, challenges in ecotourism, opportunities for improvement, impact of seasonality on visits, and tourism infrastructure, the table demonstrates the extent to which each group is engaged and highlights their particular interests and concerns.

This nuanced compilation of stakeholder input not only underscores the multi-faceted nature of ecotourism, but also serves as a vital tool in understanding the complex socio-economic and environmental dynamics at play. These dynamics must be considered in the pursuit of sustainable ecotourism development. Each identified theme is pivotal, revealing the interconnectedness of the local community's livelihoods, preservation of the environment, and economic viability of ecotourism. This table provides a clear understanding of the areas that demand attention and inform future policy and management strategies aimed at fostering sustainable ecotourism in Desa Rangko.

Market Demand

This dimension focuses on understanding the needs and preferences of potential ecotourists (Beaumont, 2011). In ecotourism, market demand gauges the extent of interest of tourists in eco-friendly travel experiences. It identifies what visitors seek, from immersion in nature to interaction with local communities, or even learning about conservation efforts in the region. Understanding market demand is crucial because it helps shape ecotourism products and experiences that cater to tourists' expectations, ensuring their satisfaction while respecting the limits of the environment.

Goa Rangko, a captivating cave attraction located a mere 15 km from the popular tourist hub of Labuan Bajo in Manggarai Barat, NTT, has been an integral part of the region's ecotourism narrative (Figure 1). However, the ebb and flow of its visitor statistics offer insights into broader trends, challenges, and the cave's unique appeal, all of which are managed under the aegis of Dinas Pariwisata, Ekonomi Kreatif dan Kebudayaan (Disparekrafbud) Manggarai Barat. According to official records from Disparekrafbud for 2022, Goa Rangko attracted a commendable total of 17,361 visitors. A deeper dive into these numbers reveals a dominant preference among domestic tourists (Ardin, 2023). Of the total, 13,371 visitors were from within the archipelago, aptly termed 'wisatawan nusantara,' while international tourists, or 'wisatawan mancanegara, numbered 3,990 (Ardin, 2023). This significant skew towards domestic tourism underscores the cave's entrenched position in the domestic tourism circuit, pointing to potential untapped international market opportunities.

However, as with tourism analysis, it is essential to understand seasonality and its influencing factors. A discernible dip in visitors was observed in December, despite it being a traditionally favorable month due to Christmas and New Year holidays. The numbers dwindled to 1,030 visitors, comprising 178 international and 852 domestic tourists (Ardin, 2023). This dip is particularly intriguing given that the preceding months witnessed relatively higher footfall, especially from June through September. The zenith was in July, which saw a remarkable surge in visitors, totaling 3,146. The reason for this December downturn, as posited, can be attributed to unfavorable weather conditions. December, notorious for its unpredictable weather, especially during the peak holiday season, plays a pivotal role in deterring potential visitors. Such climatic vagaries are not isolated to Goa Rangko; they have a ripple effect, influencing the broader Labuan Bajo region's tourist influx.

In a broader context, when analyzing Goa Rangko's market demand, it is pertinent to position it in the larger Manggarai Barat tourism landscape. This cave attraction is not isolated but shares the tourism mantle with other prominent destinations, such as Goa Batu Cermin and the cascading Cunca Wulang waterfall. Managed by Disparekraf Manggarai Barat, these attractions form a comprehensive travel experience, complementing each other (Ardin, 2023).

Community's Willingness to Participate in Ecotourism Activities

The active participation of local communities is at the heart of successful ecotourism. This dimension emphasizes gauging the readiness and enthusiasm of communities to become involved in ecotourism. This is essential because local communities play a central role in preserving the authenticity of tourism experiences. Their cultural insights, local ecosystem knowledge, and traditional practices enrich the

ecotourism experience. Moreover, their active involvement ensures that the economic benefits of tourism are channeled back into the community, thus enhancing local livelihoods.

Ecotourism's sustainable heartbeat relies heavily on the pulse in the local community's engagement. The sea is one part of Labuan Bajo's journey as a premier tourist destination in Indonesia. Its geographical and cultural richness offer an expansive canvas waiting to be painted with varied tourist experiences. Among these treasures is Goa Rangko in Kabupaten Manggarai Barat, whose unique appeal lies in the amalgamation of the aquatic and terrestrial. The strategic development of 'desa wisata' or 'tourism villages' is a testament to the forward-thinking approach.

After the debilitating effects of the COVID-19 pandemic, these tourism villages offer a ray of hope, a vehicle to reignite the stagnating economic wheels of the community. Goa Rangko, with its unparalleled beauty, dominated by a 7-meter deep saline pool with crystal-clear water and breathtaking stalagmite and stalactite formations, has become a beacon for tourism in the 'new normal' (Antara & Chairunnisa, 2021). Its proximity to the coast and unique cave formations make it a rare gem in global tourism tapestry. The Manggarai Barat community's engagement in tourism development is not new and started well before the pandemic. Their support is evident from their significant participation rates, showcasing the majority's active involvement in endorsing and managing tourism activities. The "Tumbuh Kembang Partisipasi" concept of community participation in tourism in Labuan Bajo provides opportunities for community engagement, facilitated by mentoring and guidance from the Central Government, namely Kemenko Parekraf and Perumda Bidadari. The community's willingness and capability to participate is evident, albeit limited to a fraction of Small and Medium Enterprises (SMEs): 40 SMEs out of 944 small and 317 home industries (Ismowati et al., 2022).

In Labuan Bajo's tourism context, community participation has been characterized through a tiered approach, encompassing execution, benefit realization, and evaluation. Execution denotes the active engagement of locals in tourism operations, such as tour guidance and site management, which is the most visible and immediate form of participation. Benefit realization pertains to how tourism's economic and social advantages are distributed and perceived by the local population. This can be seen in the enhanced infrastructure and living standards of the community members involved in tourism. Evaluation involves the community's role in assessing the outcomes of tourism activities, where they contribute to their perspectives on the impact and success of these endeavors. However, a gap was identified in the planning phase of tourism development. Despite the active participation of the Manggarai Barat community in the implementation phase, their involvement in the crucial planning stage is missing. This disconnect suggests that, while the community contributes significantly to tourism's operational and evaluative aspects, their insights and needs may not be sufficiently incorporated at the strategic level. This was determined by reviewing participation in local tourism planning meetings and the structure of governance bodies overseeing tourism development, where community representation appears to be lacking. The study by Ismowati et al. (2022) underlines that most of the Manggarai Barat community in Labuan Bajo is actively involved in executing tourism-related roles, with many contributing to the area's management and operating small and medium-sized enterprises. However, their input in the initial planning stages, which set the direction and policies of tourism strategies, remains limited. Recognizing this oversight is crucial for ensuring that tourism development strategies are inclusive and reflective of the community's aspirations and needs, ultimately leading to more sustainable and equitable tourism practices.

Socio-economic Linkages of Tourism to Biodiversity Conservation

Ecotourism is not only about offering an eco-friendly travel experience; it also ensures that the revenue generated from these activities contributes to biodiversity conservation (Thompson et al., 2018). This dimension delves into how the financial and economic aspects of tourism intersect with conservation initiatives. It examines how tourism revenues can be reinvested into protecting and maintaining ecosystems, ensuring that these natural assets continue to attract tourists and preserve them for future generations. Goa Rangko, an illustrious name in the Rangko Tourism Village, isn't merely famed for its natural beauty. Beyond its caves and pristine waters lies a community that has adeptly interwoven its socioeconomic pursuits with the rich biodiversity they are nestled in. One of

the star attractions is the 'Ikan Cara' - a fish that holds economic significance for the people of Rangko (Ananta, 2021; Kaha, 2021). Unlike Ikan Cara from other regions, such as Papagrang and Dawrah in Sulawesi, the Rangko variant has unique characteristics that make it particularly sought after. Owing to its petite size, flattened shape, and thinly layered flesh, it is distinct from its counterparts. Its low salt content makes it a healthier choice and a delicacy that tells tales of the Rangko coastal biodiversity.

This fish has broader socioeconomic implications for the community. It is not merely a food source but also represents livelihoods, skills, and traditions (Ananta, 2021; Kaha, 2021). Drying and packaging Ikan Cara exemplifies how the community capitalizes on its biodiversity to meet economic needs. As travelers frequent Goa Rangko, they often leave with packets of dried Ikan Cara, a memento that reminds them of their vacations. (Ananta, 2021; Kaha, 2021) However, this isn't just a tale of commerce; it reflects a community's adaptive strategies. Over time, the residents of Rangko learned to respect, preserve, and harness their biodiversity. Their approach towards fishing, drying, and packaging Ikan Cara ensures sustainability. By focusing on responsible fishing practices, the community ensures that the fish population remains robust, preventing overfishing, which could destabilize the marine ecosystem. Furthermore, with the prominence of tourism, there has been an increased focus on sustainable practices. As tourists become increasingly environmentally conscious, there is a drive within the community to ensure that their activities do not harm biodiversity. This not only preserves ecological balance but also enhances the appeal of Goa Rangko as a destination.

The Ability of the Area to Attract and Host Visitors

This dimension concentrates on the inherent attractiveness of the destination and its capacity to cater to tourists without compromising ecological integrity. Only some beautiful locations can or should be transformed into ecotourism destinations. There are considerations regarding infrastructure, access, available amenities, and the potential impact of having visitors in a sensitive area. By evaluating the ability of an area to attract host visitors, stakeholders can strike a balance between sharing a destination's wonders and ensuring its longevity.

The allure of a destination is not merely limited to its natural or cultural wonders, but is intricately connected to its resilience, adaptability, and the undying spirit of its people. Labuan Bajo in the Kabupaten Manggarai Barat (Mabar) is one such testament. When the world came to an unexpected halt in the early stages of 2020 due to the COVID-19 pandemic, no sector was, perhaps, starkly impacted as tourism. Data from Dinas Pariwisata dan Kebudayaan (Disparbud) of Kabupaten Mabar paints a grim picture. In 2019, the region witnessed 256,171 visitors. However, 2020 saw a steep decline to just 44,505, a staggering drop of 83% (Viana & Jehola, 2023). Domestic tourism was hit even harder, with a 96% reduction, plummeting from 1,897 in 2019 to 83 in 2020 (Viana & Jehola, 2023).

These statistics, as voiced by Kadisparbud Agustinus Rinus, are not just numbers on paper but reflect the challenges and despair faced by the local community and businesses. The drastic 70% and 89% decrease in visits from national and international tourists, respectively, further underscore the magnitude of the pandemic's impact (Viana & Jehola, 2023). Amidst this overwhelming backdrop, the spirit of Labuan Bajo shone through, with nature's marvels like the Komodo dragons drawing 15,792 visitors in 2020 (Viana & Jehola, 2023). Followed by destinations like Pulau Rinca, Cunca Wulang, Goa Rangko, Goa Batu Cermin, and the unparalleled diving and snorkeling experiences that collectively drew thousands.

Admittedly, the journey to places such as Goa Rangko is not easy (Prodjo & Made, 2015). Uneven terrain, roads demanding better maintenance, and costs that could be intimidating are challenges that visitors might encounter. However, the pristine beauty of the place, mainly when the sun graces the cave's interiors, offers an experience in which words might fail to be captured entirely. As many visitors might jest, missing this magical moment might leave one feeling 'zonk' or disappointed. But therein lies the magic of Labuan Bajo. It is not just about the statistics but also the stories and experiences that linger on in the memories of its visitors. While infrastructure and logistics can be enhanced over time, a place's intrinsic beauty and ethereal experience are timeless. The raw, unfiltered

beauty of nature, combined with the warm hospitality of the locals, makes Labuan Bajo a destination that, even in the most challenging times, resonates with the hearts of those fortunate enough to witness its charms.

Environmental Impacts of the Tourism Activities

Even with the best intentions, every tourism activity has its own environmental footprint. This dimension emphasizes a comprehensive assessment of the impact of tourism activities on the environment. It aims to identify and minimize negative consequences, such as waste generation, water usage, or disruptions to local wildlife, and ensure that the ecological health of the destination remains uncompromised.

Although beneficial for economies and cultural exchanges, tourism often comes with environmental concerns. Waste management is one of the most pronounced concerns, and Goa Rangko in Labuan Bajo has not yet been spared. Goa Rangko, a popular tourist attraction in the Rangko village of the Tanjung Bolong sub-district in Manggarai Barat (Mabar), has been facing a significant issue with plastic waste (Anthony, 2020). This waste originates from the influx of domestic and international tourists and nearby communities and sometimes gets washed ashore from the sea. Such waste accumulation can lead to severe ecological damage, affecting marine life and the natural beauty of the surroundings, thus diminishing the site's attractiveness to future tourists.

The initiation of the BISA (Bersih, Indah, Sehat, Aman) movement, which translates to Clean, Beautiful, Healthy, and Safe, reflects the administration's commitment to preserving the region's beauty. Launched by the Badan Otorita Pariwisata Labuan Bajo Flores (BOPLBF) to coincide with World Tourism Day on 27th September 2020, this campaign underscores the importance of cleanliness and environmental consciousness (Anthony, 2020). Beyond mere awareness, the campaign emphasizes adherence to health protocols, especially during the Covid-19 pandemic. Emphasis on Cleanliness, Health, Safety, Environment (CHSE) protocols represents a holistic approach toward responsible tourism (Anthony, 2020). For Goa Rangko to retain its charm and preserve its environment, community involvement is crucial. By focusing on local community involvement, not only can the waste issue be managed more effectively, but the community can also take ownership of its heritage, thereby ensuring protection for future generations.

However, Komodo National Park, particularly on Padar Island, experiences a slightly different set of environmental challenges. The predominant litter found here directly results from specific human activities, as highlighted in this research. The significant presence of cigarette butts, candy wrappers, wet tissues/wipes, and outsoles from shoes/sandals indicates primary activities leading to pollution, such as smoking, food and beverage consumption, and hiking (Cordova et al., 2021). This specific nature of litter can be attributed to the recreational activities promoted by the park (Cordova et al., 2021). The park's vast natural landscape, hiking trails, and scenic viewpoints attract numerous tourists. Without proper guidance or regulations, this has led to a surge in waste that is directly linked to these activities. Both Goa Rangko and Padar Island in Komodo National Park reflect the broader issues of plastic pollution and littering that affect many tourist destinations globally. However, the nature of litter and its primary sources provide crucial insights into activities that require more stringent regulations.

Strengths, Weaknesses, Opportunities, Threats (SWOT) Analysis

The SWOT analysis conducted for Goa Rangko in Labuan Bajo was carefully designed to incorporate the dimensions set forth by Carroll and Groom, which were instrumental in assessing the sustainability of tourism initiatives. These dimensions, encompassing environmental, economic, and sociocultural aspects, were used to inform and guide the SWOT framework, ensuring a holistic and nuanced evaluation of the tourism landscape. In the strengths category, the environmental dimension highlighted Goa Rangko's pristine natural settings, while the sociocultural dimension was reflected in the rich cultural heritage that attracts tourists. Economically, the thriving tourism market before the pandemic showcased the area's growth potential. Conversely, weaknesses were identified through Carroll and Groom's lenses, such as environmental challenges related to waste management and the socioeconomic impact of the COVID-19 pandemic, which has disrupted tourism flows and local

livelihoods. Opportunities emerged from the analysis, such as the potential to develop sustainable tourism practices that align with environmental conservation goals and harness the cultural richness of the area for more profound tourist engagement. These opportunities align with governmental efforts to support and revitalize tourism after the pandemic. Lastly, threats were identified, including ongoing environmental issues and the need to manage tourism's growth without compromising the area's ecological integrity or cultural authenticity. At the heart of Goa Rangko's appeal is its awe-inspiring Natural Beauty. The destination carved a unique space with its multifaceted landscapes. From the intricate designs of stalagmites and stalactites, because geology enthusiasts the crystal-clear saltwater pools providing a tranquil escape, nature reigns supreme here. Such breath-taking sights do not just capture the eye; they rejuvenate the soul, making Goa Rangko a haven for those seeking respite from urban chaos.

The addition of layers to this natural charm reflects the region's Cultural Richness. Local traditions serve as a bridge that connects visitors to the rich tapestry of the region's history. Delicacies such as Ikan Cara are not just culinary treats; they encapsulate centuries of culinary evolution, offering tourists a taste of authenticity. Such cultural treasures elevate a mere visit into an enlightening experience, satisfying both the palate and soul. Anchoring these assets is robust Governmental Support. The proactive steps manifested through initiatives such as the BISA movement and CHSE protocols signal the region's drive towards harmonizing tourism growth with ecological balance. This foresightedness by local authorities ensures that the delicate balance between development and preservation remains intact. Finally, the role of community involvement must be balanced (Suryawan & Lee, 2023; Sutrisno et al., 2023a). The local community is not a passive spectator, but an active participant (Suryawan, Septiariva, et al., 2023), shaping the region's tourism narrative. Their involvement adds an invaluable personal touch, ensuring that visitors not only see Goa Rangko but also feel it.

Goa Rangko stands at the cusp of a golden Sustainable Tourism Development opportunity in a world increasingly conscious of environmental responsibility. By championing responsible practices, it can carve a niche for itself, resonating with travelers keen on minimizing their carbon footprints. The region's unique offerings, like Ikan Cara, present a lucrative avenue for Local Product Promotion. Packaging specialties such as souvenirs can bolster the local economy while offering tourists tangible memories of their visits. Collaboration with environmental groups offers two benefits: effective conservation and positive branding. Partnerships with Environmental Organizations can amplify conservation efforts and position Goa Rangko as a sustainable tourism pioneer. In today's digital age, Technology Integration can redefine the tourist experience. From virtual reality explorations of caves to efficient waste management, technology stands as a potent ally ready to be harnessed. However, Goa Rangko is not without its challenges. Waste management is the most pressing and the blight of plastic tarnishes the region's pristine reputation, signaling deeper ecological concerns (Sianipar et al., 2022; Suryawan et al., 2022). Addressing this issue requires urgent intervention.

Compounding this issue is an infrastructural challenge. In this era of convenience, the lack of amenities and challenging accessibility can deter potential visitors. Although caves and coasts are undeniably magnetic, Limited Diversification in tourism activities can lead to stagnation. The area needs to continuously innovate to sustain its interest. The COVID-19 Impact, with its harsh economic implications, is a grim reminder of the region's vulnerability to global events. The waste issue could spiral into Continued Environmental Degradation, which would be catastrophic for destination banking on natural beauty (Sutrisno et al., 2023b). Competitive Destinations always lurk over a horizon. To remain relevant, Goa Rangko must perpetually evolve, offering refreshed experiences. Being coastal, threats of climatic change and natural disasters are omnipresent. These can wreak havoc, both ecologically and economically. Lastly, economic instability driven by global events can disrupt tourist inflow, especially in the international segment, underscoring the need for a diversified tourist base.

Incorporating Carroll and Groom's dimensions into the SWOT analysis provided a structured approach for interpreting Goa Rangko's ecotourism context within a sustainable development framework. The SWOT analysis was enriched by applying the theoretical underpinnings of the following dimensions: environmental stewardship, economic viability, and socio-cultural integrity.

Carroll and Groom’s framework underscores the need for environmental protection as a key strength, which in the case of Goa Rangko, is exemplified by its natural beauty and resources. These are prominently listed as strengths in the SWOT analysis, noting the area’s unique cave systems and nearby coastal attractions. The cultural richness of local traditions and crafts aligns with the sociocultural dimension, recognizing the depth of authentic cultural encounters as another significant strength. The economic dimension is reflected in the opportunities and weaknesses sections. Economic sustainability was highlighted through opportunities for local product promotion. At the same time, weaknesses, such as waste management issues, pointed to economic challenges that could arise from environmental degradation if not appropriately managed. Community involvement, a cross-cutting theme in Carroll and Groom’s model, was showcased as a strength with significant local participation in tourism-related activities. However, the need for improved infrastructure and diversified tourism offerings was identified as a weakness, indicating areas in which economic sustainability could be strengthened. The threats section considers the potential for continued environmental degradation and the impact of global economic instabilities, emphasizing the framework’s focus on long-term sustainability. By linking Carroll and Groom’s dimensions to the SWOT analysis, we were able to craft a comprehensive picture of ecotourism in Goa Rangko that not only assessed its current state, but also provided strategic directions for sustainable growth. This connection between the theoretical dimensions and practical insights from the SWOT analysis aimed to create a robust platform for informed decision making and strategic planning in ecotourism development.

Table 2. Strengths, Weaknesses, Opportunities, Threats (SWOT) Analysis

Strengths	Weaknesses
1. Natural Beauty: Goa Rangko boasts beautiful natural landscapes, including unique caves with stalagmites and stalactites, clear saltwater pools, and nearby coastal areas. This natural appeal acts as a magnet for tourists.	1. Waste Management: The accumulation of plastic waste on beaches has led to environmental degradation. Inadequate waste management systems exacerbate this problem.
2. Cultural Richness: The local traditions, crafts (such as the distinct Ikan Cara), and indigenous knowledge provide unique experiences that attract tourists looking for authentic cultural encounters.	2. Infrastructure Challenges: The lack of well-maintained roads and essential facilities could discourage tourists.
3. Governmental Support: Initiatives like the BISA movement and CHSE protocols reflect the local government’s commitment to cleanliness and sustainability.	3. Limited Diversification: While Goa Rangko is famous for its caves and nearby coastal areas, the limited diversification of tourist activities might lead to a saturation point.
4. Community Involvement: A considerable portion of the local community participates in tourism-related activities, reflecting the social capital that can be leveraged to promote responsible tourism.	4. COVID-19 Impact: The sharp decline in tourist numbers in 2020 due to the pandemic has greatly affected the local economy.
Opportunities	Threats
1. Sustainable Tourism Development: Emphasizing responsible and sustainable tourism can create a niche market and appeal to environmentally conscious travelers.	1. Continued Environmental Degradation: Failure to address the waste issue could lead to further environmental damage, ultimately eroding the area’s main attraction.
2. Local Product Promotion: Capitalizing on unique products like Ikan Cara as souvenirs can enhance the economic benefits of tourism and reduce reliance on imported goods.	2. Competitive Destinations: Other destinations offering similar experiences can become fierce competitors if Goa Rangko fails to innovate and diversify its offerings.
3. Collaboration with Environmental Organizations: Partnerships with NGOs and environmental groups can lead to effective conservation strategies.	3. Climatic Changes and Natural Disasters: Being a coastal area, it may be vulnerable to climatic changes and natural disasters such as tsunamis or cyclones.
4. Technology Integration: Utilizing technology for waste management, online bookings, virtual tours, and efficient communication can enhance the tourist experience.	4. Economic Instabilities: Global economic fluctuations can affect the spending capacity of potential tourists, particularly international ones.

The SWOT analysis for Goa Rangko's tourism offers comprehensive insight into its strengths, weaknesses, opportunities, and threats, leading to several vital policy implications for sustainable development. First, environmental stewardship is a pressing concern. There is an urgent need for strict environmental regulations to tackle the issue of accumulating waste, particularly plastics. This might involve promoting biodegradable alternatives to single-use plastics and setting up efficient waste collection and recycling systems. This not only preserves pristine natural beauty – a primary attraction for tourists – but also ensures the wellbeing of local communities.

Simultaneously, the infrastructural challenges of the region underline the importance of allocating resources for better access to roads, public transportation, and essential tourist facilities. Improved infrastructure would elevate the tourist experience while providing tangible benefits to the locals. The region's rich cultural tapestry presents an opportunity that is too significant to overlook. Policies should actively promote and protect cultural richness, possibly through cultural centers, local festivals, and incentives for artisans (Suryawan & Lee, 2023). Moreover, fostering public-private partnerships can act as catalysts for sustainable tourism development. Collaboration with environmental groups, NGOs, and the private sector can share resources and expertise, magnify conservation efforts, and promote strategies (Nguyen et al., 2022; Suryawan & Lee, 2023). Harnessing technology can streamline operations and enhance tourist experience. Technological integration offers multifaceted benefits from advanced waste management systems to apps offering tourist information and virtual tours. Furthermore, there is a pressing need to diversify tourism activities. While caves and coastal regions are primary attractions, introducing various segments, such as culinary or ecotourism, can attract a broader tourist base.

CONCLUSION

The research objective of this study was to understand and evaluate the tourism potential of Goa Rangko while concurrently addressing the challenges impeding its sustainable development. Through a comprehensive SWOT analysis, this study systematically identified and assessed the region's natural and cultural strengths, weaknesses, opportunities, and threats. This analysis aims to shed light on critical issues that require attention and intervention, thereby providing strategic insights and actionable recommendations for various stakeholders. These stakeholders include policymakers responsible for shaping tourism policies, businesses involved in the tourism industry, local communities residing near Goa Rangko, and environmental advocates committed to preserving the area's ecological integrity. This leads us to the imperatives of environmental stewardship. It is not just about preservation for tourism's sake but also about the intrinsic value of the environment and the local communities that derive sustenance from it. Therefore, policies geared towards environmental conservation do not merely serve tourists but stand as a testament to a broader responsibility towards nature and societal well-being. The SWOT analysis also pointed toward infrastructural inadequacies. Regardless of its appeal, any destination can quickly lose its shine if it reaches or navigates within, which becomes challenging. Therefore, addressing infrastructural gaps is not a luxury, but a necessity to determine the viability of Goa Rangko as a sought-after tourist destination.

Thus, there is a broader context – the world around Goa Rangko. The COVID-19 pandemic has underscored the vulnerability inherent in the global tourism sector. Such health-induced economic or environmental shocks can have cascading effects on local communities heavily reliant on tourism. This calls for resilience building in terms of health infrastructure and economic buffers. At its core, tourism is about experiences, which are co-created by visitors and hosts. The local community's active involvement in tourism-related activities offers a dual benefit: it ensures that tourists obtain authentic experiences while also guaranteeing that the benefits of tourism trickle down to the grassroots level. A community that benefits directly from tourism will invariably be its staunchest custodian. Finally, amidst all the deliberations about the present and the future, one must not forget the lessons of the past. Cultural richness, evident through local traditions and unique crafts like Ikan Cara, is as much a

bridge to the past as it is an attraction for the present. Protecting and promoting this cultural heritage ensures that, while Goa Rangko embraces modernity, it does not lose its soul in the process.

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